

**Benchmarking Report on
Business Process Analysis and Systems Design
for Electronic Recordkeeping**

Conducted by the National Archives and Records Administration

September 30, 2005

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Executive Summary

Background

The Business Process Analysis (BPA) Benchmarking Team was formed in the fall of 2004 as part of the National Records Management Program Fiscal Year 2005 work plan. The team was charged with “conducting at least four benchmarking visits with government agencies, university research groups, and private service providers on business process analysis and systems development to support electronic recordkeeping.” The team’s charge alluded to two possible ways of identifying recordkeeping requirements and ensuring that they are met in new systems design: 1) business process analysis and 2) integration of recordkeeping requirements into the systems development life cycle. The team investigated both approaches by conducting benchmarking interviews focused on six specific methodologies:

Business Process Analysis

- *Australian Standard: Work Process Analysis for Recordkeeping, AS 5090-2003*
- Center for Technology in Government. Models for Action tool from *Practical Tools for Electronic Records Management and Preservation*
- The Minnesota State Archives. *Trustworthy Information Systems Handbook*

Integration of Recordkeeping Requirements into the Systems Development Life Cycle

- US Patent and Trademark Office. *USPTO Electronic Records Management Technical Standard and Guideline*, July 2002
- The Federal Bureau of Investigation. *FBI Electronic Recordkeeping Certification Manual*
- The Central Intelligence Agency. *Electronic Recordkeeping System (ERKS) Requirements*

Findings

During its work, the Benchmarking Team discovered unique strengths in all six methodologies that make them valuable for identifying electronic recordkeeping requirements or otherwise improving electronic records management. The exemplary practices in these specific methodologies represent two different yet complementary ways of ensuring that recordkeeping requirements are identified and met in new information systems design. One approach, business process analysis, identifies process-specific recordkeeping requirements that cannot be identified except through examination of a particular function’s needs. The other approach, certification of new information systems against a predefined list of requirements for recordkeeping system functionality, is the best way of ensuring that all important systems are able to handle records appropriately. An agency that uses both approaches can be confident that it is capturing the right records in all formats required to meet its business needs and that it is creating, maintaining, protecting, and providing appropriate access to authentic, reliable, and trustworthy records throughout the records’ life cycle. The Benchmarking Team believes that the methodologies described in this report provide a wide range of practical tools and models

that could enable all Federal agencies, regardless of their current electronic records management and system development sophistication, to develop comprehensive policies and procedures for integrating records management requirements into new information technology (IT) systems.

Common Themes

- Records managers need to focus on the business process.
- Business process analysis and system development are resource intensive, but including recordkeeping in preexisting processes minimizes additional cost.
- Risk management can help decide which processes justify intensive analysis and which systems must meet all requirements.
- Success in identifying and meeting recordkeeping requirements in new systems design depends on the interaction of people, processes, and technology.
- Records managers need new skills to participate in new processes.

1. Report

1.1 Background

The Business Process Analysis (BPA) Benchmarking Team was formed in the fall of 2004 as part of the National Records Management Program Fiscal Year 2005 work plan. The team was charged with “conducting at least four benchmarking visits with government agencies, university research groups, and private service providers on business process analysis and systems development to support electronic recordkeeping.”

The ongoing transition to electronic recordkeeping in the Federal government drives the need for the National Archives and Records Administration (NARA) to identify best practices in business process analysis and systems development for electronic recordkeeping. Although agencies are performing many business functions electronically, a lack of concentrated attention to recordkeeping early in the systems development process may result in electronic records that are not captured, do not document an agency’s work adequately, or do not have the characteristics of trustworthy records: authenticity, reliability, integrity, and usability. Ultimately, NARA hopes to identify best practices through benchmarking that it can encourage other agencies to use, thereby increasing the odds that agency electronic information will be adequate for the agency’s recordkeeping needs and will endure for as long as it has value.

NARA’s *Strategic Directions for Federal Records Management*¹ lays out nine strategies and twenty-six tactics to ensure that NARA’s programs support the essential goals of records management in the electronic environment. The BPA Benchmarking Project is one of many NARA projects that directly support these strategies and tactics. The BPA Benchmarking project “demonstrates that effective records management adds value to business processes” (Strategy 2) by showing that business process analysis which includes a records perspective can help streamline work processes as well as identify and meet business needs for records. It helps agencies “choose a variety of means to manage their records” (Strategy 4) by showing agencies how to design their information systems to also serve as recordkeeping systems, rather than requiring them to set up separate recordkeeping systems outside the business process. It also provides an example of how NARA can “partner with other agencies to develop, adapt, or adopt products and practices that support good records management” (Strategy 8) by highlighting best practices and helping other agencies learn from the early adopters. Finally, the BPA Benchmarking Project supports Tactic 11, “planning tools to build records management considerations into procurement processes for new systems,” by providing examples of how organizations have already integrated records management into the systems development life cycle, a process closely related to system procurement.

In addition to the *Strategic Directions for Federal Records Management* initiatives, NARA is working on formally building records management into the Federal Enterprise

¹ *NARA’s Strategic Directions for Federal Records Management*, July 31, 2003.
<http://www.archives.gov/records-mgmt/initiatives/strategic-directions.html>

Architecture through its Records Management Profile and Records Management Service Components projects. NARA is educating Federal chief information officers and other agency personnel about the stages at which records management should be integrated into the systems development lifecycle, with particular focus on capital planning and business process redesign. NARA hopes that these high-level advocacy and infrastructure activities will create a demand in agencies for knowledgeable records management input into systems development projects. The BPA Benchmarking activities are the first step in preparing agency and NARA records management staff to provide that knowledgeable records management guidance.

1.1.1 Purpose

The purpose of the Business Process Analysis Benchmarking Project is to identify workable, reproducible methodologies for integrating a records management perspective into business process analysis and into the systems development lifecycle so that recordkeeping requirements are identified and met in new systems design. NARA hopes that the owners of these methodologies, once identified, will allow us to publicize them as best practices so that other organizations can learn from the early adopters.

1.1.2 Scope

The BPA Benchmarking Team's charge to investigate "business process analysis and systems development to support electronic recordkeeping" alludes to two basic approaches for identifying recordkeeping requirements and ensuring that they are met in new systems design: 1) business process analysis and 2) integration of recordkeeping requirements into the systems development life cycle. The team investigated both. (For a diagram of the systems or solution development life cycle, see Appendix B.)

Business Process Analysis: Business process analysis generally happens before or during the concept exploration phase of the systems development life cycle, regardless of whether or not records managers are involved. In the analysis that occurs during redesign, the business process is usually mapped and then examined for improvement opportunities. In a records-aware business process analysis, the analysts break a work process down into constituent tasks and subtasks and then ask a series of questions about how and why each task is documented. Questions include whether a record is created or changed by a subtask, who needs access to the record, and whether there are laws, regulations, or professional practices that guide how the subtask is performed or recorded. Because the Office of Management and Budget's (OMB) capital planning process requires all agencies to redesign their business processes before submitting a capital request for a new information technology (IT) system, agencies need to perform business analysis as part of their redesign efforts prior to the formal start of the systems development life cycle in any case. The BPA methodologies we investigated provide a records-aware set of activities and questions that can supplement the process that business analysts should be using already. The result of these methodologies is a set of detailed, process-specific recordkeeping requirements which can then be passed on to the requirements-gathering and design stages of the systems development life cycle.

According to standard IT practice, business analysis also occurs as part of the requirements-gathering stage of the systems development life cycle. The purpose of this kind of analysis is to learn about the business process being automated and to identify system requirements relating to functionality, data, performance, security, user interfaces, and many other factors, but generally not explicitly to records. Identification of recordkeeping requirements requires a records-aware business process analysis, which can take place either during business process redesign, or during the later analysis phase of the systems development life cycle, or during both phases.

Integrating Records Management into the Systems Development Life Cycle: In modifying the systems development life cycle to integrate recordkeeping concerns, records managers gain recognition as full stakeholders with approval authority at the various control gates through which a new system passes. Records managers use a predefined list of requirements that a system must meet in order to manage records appropriately, in most cases derived from the Department of Defense's STD-5015.2: *Design Criteria Standard for Electronic Records Management Software Applications* (DOD 5015.2-STD). They work with system owners or project managers to ensure that these requirements are included in the system requirements documentation and in the system design, and then to ensure that the requirements are met in the system as built. If the requirements are not met, the records managers can withhold approval of the system until they are.

Both of these valuable approaches lead to improved management of electronic records through influence on the design of new IT systems, although in somewhat different ways.

The scope of the Team's search for organizations that were successfully using either of these practices was very broad. As specified in the Team's charge, it considered "government agencies, university research groups, and private service providers" in its search.

1.1.3 BPA Benchmarking Team

The BPA Benchmarking Team consisted of representatives of NWML and NR. It included overlapping membership from the Electronic Records Services Team (Barbara Byers) and the E-Systems Team (Meg Phillips).

Meg Phillips, NRBM, *lead*
Larry Baume, NWML
Barbara Byers, NREM
Tom Cotter, NWML
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1.1.4 Benchmarking Process and Timeline

Keeping in mind its broad mandate to conduct benchmarking interviews with "government agencies, university research groups, and private service providers" who

have successfully engaged in the use of business process analysis and systems development in support of electronic recordkeeping, the Benchmarking Team reviewed the project parameters, the benchmarking process, and potential benchmarking sites during the First Quarter of Fiscal Year 2005. In the Second Quarter, we developed a list of interview questions, finalized a list of benchmarking sites, and drafted a formal interview invitation for the signature of NARA's Director of Life Cycle Management. In March of 2005, we began informal contact with the benchmarking sites to determine their interest in participating and which of their staff members we should interview. Once we identified the appropriate contact people and had a preliminary expression of interest, we sent the formal invitation and the Benchmarking Questionnaire to the interviewees and scheduled the interviews.

The Team conducted five telephone and two in-person benchmarking interviews covering six methodologies between March 30, 2005 and June 8, 2005. (We interviewed two Australian sites about one process.) During each two-hour interview, one team member asked questions, while one or two other team members took notes to capture the responses. Following each interview, all notes were consolidated for review and validation by each benchmarking partner. The Team accepted recommended changes, giving interviewees the final say in how we described their processes. In most cases, the Team had detailed documentation of the processes in question by the time of the interview, either because the documentation was publicly available or because the site had shared its documentation with NARA. The Team used a combination of documentation and interview responses to learn as much as possible about the methodologies.

1.1.5 Schedule of Benchmarking Interviews

Date	Methodology	Site	Interviewees
3/30/05	<i>Australian Standard: Work Process Analysis for Recordkeeping, AS 5090-2003</i>	National Archives of Australia	Anne Liddell, <i>Assistant Director of Recordkeeping Policy</i> Colleen McEwen, <i>Director of Information Management</i>
4/6/05	<i>Australian Standard: Work Process Analysis for Recordkeeping, AS 5090-2003</i>	University of Sydney, Australia	Anne Picot, <i>Assistant Manager, Archives and Records Management Services</i>
4/7/05	<i>Trustworthy Information Systems Handbook</i>	Minnesota State Archives	Robert Horton, <i>State Archivist</i>
4/20/05	<i>USPTO Electronic Records Management Technical Standard and Guideline, July 2002</i>	US Patent and Trademark Office	Susan Brown, <i>USPTO Records Officer</i> Walter Bohorfoush, <i>USPTO Electronic Records Team Leader</i>
4/26/05	<i>FBI ERKC - Electronic Recordkeeping Certification Manual</i>	Federal Bureau of Investigation	Michael Miller, <i>Section Chief, Records Automation Section</i> Elizabeth Fugitt, <i>Unit Chief, Records Management Applications Unit</i>
5/13/05	Center for Technology in Government: Models for Action tool	[New York State Archives] ²	Alan Kowlowitz, <i>Program Technology Analyst, NY State Office for Technology</i>
6/8/05	<i>Electronic Recordkeeping System (ERKS) Requirements</i>	Central Intelligence Agency	Kyle Robson, <i>Chief Information Management Officer for the Directorate of Support</i>

The team would like to thank all of the interviewees for their participation and insight. Without their expertise, generosity, and willingness to help, this project would not have been possible.

In June, July, and August 2005, the BPA Benchmarking Team analyzed the findings and wrote the final report.

It should be noted that there are some important differences between the BPA Team's benchmarking practice and traditional benchmarking in a business context. Not only were we benchmarking publicized products or internal processes that our partners expressed an interest in sharing, but our goal was to identify best practices so that other agencies could learn from tested methodologies. In this context, the usual benchmarking

² Alan Kowlowitz helped develop the CTG's Models for Action tool while a staff member at the New York State Archives. Our interview of Mr. Kowlowitz focused on this experience. He is currently employed by the New York State Office for Technology.

emphasis on confidentiality of sources was contrary to our purpose. Consequently, we are naming our benchmarking partners because we (and they) want others to know about their useful innovations in electronic records management.

1.2 Results and Analysis

1.2.1 Findings

All of the benchmarked sites have developed excellent methodologies to improve the management of records in electronic systems from which other organizations can learn. Because the sites differed in their objectives and organizational contexts, however, they developed two distinct kinds of processes: 1) bringing a records perspective to business process analysis, or 2) ensuring that recordkeeping requirements are met in the systems development life cycle through a program of electronic recordkeeping system certification.

Three of the benchmarked organizations have no authority to enforce the application of their process. Instead they have sought to influence and provide guidance on the identification of recordkeeping requirements, often without even knowing where their process has been applied. The Center for Technology in Government (CTG) and the Minnesota State Archives have both produced tools that are freely available on the Internet for anyone to use. *Australian Standard: Work Process Analysis for Recordkeeping* was developed to provide additional guidance on the topic of analyzing business activities, which is important to the *ISO Records Management Standard* as Step B of the methodology for Designing and Implementing Records Systems but is not explained in detail in the standard. The *Work Process Analysis Standard* is also designed to be flexible enough for any organization to use. Because all of these methodologies were designed to be used widely, they focus on providing a flexible process that organizations can follow to identify their recordkeeping requirements rather than a specific or tailored checklist of predefined requirements.

The other three organizations, the FBI, CIA, and USPTO, developed processes to ensure that recordkeeping requirements were identified and met in their own organizations. They all started off with good structural relationships between records management and IT, all had well-developed systems development life cycle methodologies in place, and all shared a Federal recordkeeping environment. In this environment the most effective way for records managers to exert influence on the ability of IT systems to appropriately manage records is to piggyback on the existing systems development life cycle by integrating a predefined checklist of recordkeeping requirements (derived from NARA guidance and from DOD 5015.2-STD) into the overall requirements gathering activity. In the FBI and CIA, records managers have the authority to certify that a system meets all relevant recordkeeping requirements and can appropriately manage records. USPTO achieves a similar result with the *Electronic Records Management Technical Standard and Guideline*, an integral part of the systems development life cycle that is enforced by

the Technical Review Board. Building records management into the robust systems development infrastructure at these agencies ensures that all systems above a defined threshold will be held to the standard recordkeeping requirements. Also, because these methodologies were designed specifically for each agency, the requirements and processes are customized for their environments and include the agency's relatively stable legal and regulatory requirements.

Most of the requirements identified by the certification processes are system functional requirements derived from DOD 5015.2-STD. These requirements focus on the capabilities a system must possess in order to manage records, but they do not provide guidance on: what specific records are required by the business process being automated, what constitutes a record, who should have access to it, what its retention period should be, and so on. Instead, the system functional requirements guarantee that the system will be capable of performing necessary actions such as capturing records, maintaining access control, and applying retention rules.

1.2.2 Strengths of Specific Methodologies

Although the methodologies we benchmarked fall into two broad categories, each has unique strengths that make it particularly valuable for identifying electronic recordkeeping requirements or otherwise improving electronic records management.

The *Australian Standard: Work Process Analysis for Recordkeeping* is unique for its practical guidance on mapping a work process and conducting both functional and sequential analysis. Particularly valuable are the clear and usable sets of questions that relate to each stage of the analysis and the focus on documenting variations in work processes. The Australian *Work Process Analysis Standard* moves the focus of records management to the work process and argues that recordkeeping should be a natural, integral part of the work process rather than a separate activity.

The Center for Technology in Government's Models for Action tool assumes that a business process analysis is already underway and supplies sets of requirement elicitation questions to ensure that recordkeeping requirements are identified at the business process level, at the record level, and at the system level. The tool asks the analyst to decide whether technology can satisfy each requirement identified and what management processes or procedures are necessary to ensure that all requirements are met.

The Australian *Work Process Analysis Standard* and the Models for Action tool can be used for more than automation projects. Either might be used, for instance, to help identify the problems in a broken process or to streamline an inefficient one. Models for Action, for example, provides tips on identifying process steps that may not add value and might be eliminated. Both methodologies are flexible and scalable, making them useful for a wide range of records management projects.

The Minnesota State Archives' *Trustworthy Information Systems Handbook* incorporates some characteristics of both the business process analysis methodologies and the

certification model. It contains a checklist of criteria to consider when designing a system, but also includes a list of sidebar questions which elicit the kinds of process-specific information the business process analysis tools gather. Together, these provide a complete list of recordkeeping issues to consider when developing a system. The *TIS Handbook*'s most noteworthy feature, however, appears to be its usefulness as an educational tool. Freely available on the Internet and useable without mediation from any records staff, the handbook's language targets IT and/or program staff who may never have thought about recordkeeping issues before. In addition to starting the handbook with sections explaining why trustworthy electronic records are important ("What's in it for you?" "What is a trustworthy information system?" "Why are metadata and documentation important?"), the Archives staff hired technical writers to enhance the document's clarity and layout. The result is a very clear, usable guide for IT or project management staff which can be used even in weak records management environments. The guide's success at explaining the importance of building recordkeeping requirements into new systems makes it a great tool for laying the educational groundwork in agencies where records management and IT do not yet have a close working relationship.

The US Patent and Trademark Office uses an *Electronic Records Management Technical Standard and Guideline* to integrate recordkeeping requirements into all new IT systems by requiring that system developers fill out a comprehensive recordkeeping checklist as part of the standard systems development life cycle. USPTO has taken advantage of the fact that many process-derived recordkeeping requirements for the agency are stable across many business processes and only need to be identified once. Therefore, its certification model includes more than the recordkeeping system functional requirements specified in guidance such as DOD 5015.2-STD, and it provides some of the kinds of detail that would be identified in a records-aware business process analysis (such as suggested case file metadata.) Additional strengths of USPTO's guideline are its clear outline of the roles and responsibilities of the various players as well as its placement of the electronic records management activities in the systems development life cycle.

The FBI and CIA also have well-elaborated electronic recordkeeping certification processes in place which ensure that major systems will either meet specified recordkeeping functional requirements as specified by law or explain why those requirements do not apply. The records management staff have authority to approve the system design at each of several major systems development life cycle control gates.

A notable feature of the FBI's process is its extremely comprehensive and logical *FBI Electronic Recordkeeping Certification Manual*, released in April 2004. This manual includes a clear statement of the roles and responsibilities of the Records Officer and system owner. It also includes an excellent graphic showing the relationships among the processes for electronic recordkeeping certification, capital planning and investment control, security certification and accreditation, and the systems development life cycle. The FBI's manual outlines four possible paths to certification, asking system owners to choose one path during the first phase of the project. It then outlines the process for certification for both new and legacy systems. The manual provides details on doing a project recordkeeping risk assessment and includes sample tests and expected results for

each of the ERK assessment criteria. All of these features are unique to the FBI's process and make its documentation so thorough that an inexperienced system owner could figure out exactly how the process works.

The CIA, on the other hand, recently revised their 130-page *Electronic Recordkeeping System Requirements* certification document developed in 2000; they distilled it down to a very brief *ERKS Certification Guide*, including an overview of the process's purpose and steps with a short list of requirements. The CIA found that the longer manual intimidated project managers and made the ERKS process seem burdensome. Because of the support of CIA's excellent staffing structure (Information Management Officers are deployed in offices throughout the agency), the documentation does not need to bear the full burden of explaining the process. The CIA requires an Information Management Plan for each system to document all of the processes and procedures that will be used to ensure that records are managed appropriately through creation, maintenance, use, and disposition. The Plan also includes a description of the system, system records, and a traceability matrix for the ERKS requirements.

All of the methodologies that NARA benchmarked are among the leaders in identifying recordkeeping requirements and integrating them into new information systems design. Every Federal agency, from the most advanced to those just beginning to think about managing electronic records, can use these resources to find ideas for taking the next step toward electronic records management maturity. Those records managers who are still struggling to bridge the communication gap with their IT units might use the clarity and user-friendliness of Minnesota's *Trustworthy Information Systems Handbook* to help explain why such collaboration is worthwhile. In agencies where there is little infrastructure to support the systems development life cycle, or where records management cannot yet integrate an electronic recordkeeping certification process within that life cycle, records managers may be able to educate and influence system owners to think about recordkeeping questions and requirements, such as those suggested by these methodologies. If an agency has a good working and structural relationship between records management and IT, the agency might use a fully-documented certification process such as the FBI's or USPTO's *Electronic Records Management Technical Standard and Guideline* as a framework for setting up something similar. Even agencies that are leaders in certification could take the additional step of developing a standard recordkeeping business process analysis methodology for systematically identifying process-specific recordkeeping requirements. CTG's Models for Action or the *Australian Standard: Work Process Analysis for Recordkeeping* could serve as a model.

1.2.3 The Best of Both Worlds

In an ideal world, organizations would institute processes belonging to both approaches to ensure that they identify and meet all kinds of recordkeeping requirements: they would include a records management perspective in their business process analysis and would certify all new information systems against a checklist of electronic recordkeeping system requirements. The systems development life cycle process would include records

managers as stakeholders, and records managers would have the authority to approve any system that contains records as it passes each life cycle control gate.

Process specific recordkeeping requirements would be identified using a records-aware business process analysis during business process reengineering or the analysis phase of the systems development life cycle. According to the Information Technology Management Reform Act (ITMRA, AKA Clinger-Cohen³), agency CIOs, when requesting money for a large IT project, must certify to OMB that the process being automated has been redesigned. As some form of analysis is mandatory, records managers need only to influence the manner in which it is done to ensure that recordkeeping issues are addressed. Both the *Australian Standard: Work Process Analysis for Recordkeeping* and CTG's Models for Action tool argue that an awareness of what records are created and modified during a process provides a good framework for business process analysis generally. As a good first step toward integrating records concerns into this IT analysis, records managers could issue and publicize lists of recordkeeping questions to consider when doing analysis. This would increase the probability that business process analysis results will include process-specific requirements such as what records should be created, what they should contain, how long each type should be kept, who needs access to them, and what restrictions apply. The analyst should capture all identified requirements and their implementation strategies in a tracking system. (CTG provides a good example.) Where implementation strategies involve technology, requirements should be passed along to the system project manager for tracking with all other system requirements. Any requirements involving policy or management process changes, even if they do not involve technology, should also be tracked.

In addition to capturing recordkeeping requirements during business process analysis, an agency would also integrate requirements for records management functionality into the systems development life cycle. To ensure that consistent sets of recordkeeping system requirements are built into every system to which they pertain and to facilitate consistent systems approval from records managers at life-cycle control gates, agencies would develop a list of recordkeeping requirements that comply with all Federal recordkeeping laws and regulations. The requirements contained in DOD 5015.2-STD are the best starting place, although agencies might want to add other requirements for their own environments. NARA's guidance, *Electronic Records Management Guidance on Methodology for Determining Agency-unique Requirements*⁴ and *Examples of System Functions for Electronic Recordkeeping (ERK) or Electronic Records Management*

³ Information Technology Management Reform Act of 1995. (2) DIRECTION FOR EXECUTIVE AGENCY ACTION- The Director shall issue clear and concise direction to the head of each executive agency"...“(C) to analyze the missions of the executive agency and, based on the analysis, revise the executive agency's mission-related processes and administrative processes, as appropriate, before making significant investments in information technology to be used in support of those missions....”

⁴ *Electronic Records Management Guidance on Methodology for Determining Agency-unique Requirements*. Electronic Records Management E-Government Initiative, Enterprise-wide Electronic Records Management Issue Area, August 23, 2004. <http://www.archives.gov/records-mgmt/policy/requirements-guidance.html>

(ERM) provide help in identifying additional requirements for the list.⁵ Agencies might also embed their list of requirements into a package that includes guidance on when particular requirements apply, test cases for checking that requirements have actually been met, and instructions on how to navigate the process. Records Officers should certify systems that meet all relevant recordkeeping requirements and withhold certification from systems that do not, possibly with a provision for exceptions in emergency or very low risk situations.

Information systems would also automate as many of the process-specific recordkeeping requirements as possible, using the results of the business process analysis. These requirements - both functional requirements for capabilities of the system and process-specific requirements that define (among others) what constitutes a record and how long it should be kept - would be integrated with the overall requirements document generated by the systems development life cycle process and tracked to the end of the system's life. Agencies would document policy and management process strategies for meeting any requirements identified during business process analysis that could not be met through technology alone; the documentation would include a migration plan for ensuring the preservation of records with value beyond the life of the system. Tracking all requirements - not just those met in a system - would provide confidence that the right records have been captured and managed appropriately.

Any system that is being upgraded or significantly modified would need to pass through the same certification process as a new system. High risk legacy systems would also be analyzed and their shortcomings addressed, even if they are not scheduled for an upgrade.

The process of certifying recordkeeping systems exerts backward pressure on system owners, encouraging them to consult records management staff earlier in the life cycle. Since they want their systems to pass through control gates without any problems, system owners have an incentive to seek the advice of records managers well before the first review. This early consultation might provide records managers with an additional opening to introduce question sets for use during business process analysis.

1.2.4 Common Themes

In addition to an enhanced understanding of business process analysis and integrating records management into the systems development life cycle, our benchmarking partners' experiences offer a number of other lessons.

Focus on the business process. The business process provides a common language and framework for records managers to talk to process owners and system developers about records concerns. Program staff members often enjoy talking about their process, and they care what information is available to it and produced by it. To increase consideration of recordkeeping issues, records managers need to speak a language that communicates well to other stakeholders, and a focus on the business process allows

⁵ *Examples of System Functions for Electronic Recordkeeping (ERK) or Electronic Records Management (ERM)*. <http://www.archives.gov/records-mgmt/policy/prod6b.html>

records staff to do just that. Our CTG Models for Action interview particularly stressed this, but the *Australian Standard: Work Process Analysis for Recordkeeping* also emphasizes that recordkeeping should be a natural part of the business process and not an additional set of steps outside of it.

Business process analysis and system development are resource intensive, but including recordkeeping in pre-existing processes minimizes additional cost.

Agencies should already be undertaking business process analysis or business process reengineering projects in connection with all major systems, as mandated by ITMRA. Although these processes take time, money, and energy, integrating records concerns into the processes does not add significantly to the effort. Similarly, integration of recordkeeping certification into the system development life cycle does not noticeably affect overall timelines. These processes are both worth the investment in time; careful planning and analysis of requirements at the beginning of the process can prevent the waste of enormous expenditures on systems that do not function according to agency requirements or manage needed information.

Records managers need new skills to participate in new processes. Nearly all of our benchmarking partners mentioned the importance of records management staff possessing the same set of skills: process mapping, analytical thinking, speaking IT's language, leading meetings and facilitating discussions, managing projects, and familiarity with the systems development life cycle. Most important of all are written and verbal communication skills, especially the ability to explain records management concepts without jargon in a way that ties records to the business processes they document.

Use risk management. Risk management can determine which processes justify intensive analysis and which systems must meet every requirement. Almost every methodology and user integrated risk management and/or cost-benefit analysis into decision-making. To date, the National Archives of Australia has applied the procedures of the *Australian Standard: Work Process Analysis for Recordkeeping* to only two of its highest risk processes because the analysis is so time-consuming. The FBI manual includes a section on assessing the risk of failing to meet each criterion. The CIA uses a matrix analysis table that includes risk as a factor to determine which systems must pass through the full Project Management Process, of which the ERKS certification is a part.

Success in identifying and meeting recordkeeping requirements in new systems design depends on the interaction of people, processes, and technology. The major goal of records-aware business process analyses and electronic recordkeeping certification programs is to ensure that IT systems are designed to capture and manage records appropriately. Although it is a major part of the solution, technology alone cannot provide assurance that recordkeeping requirements will be identified and met. Documented processes such as the methodologies discussed in this report fulfill that role, along with trained people to implement those processes. Several of our benchmarking partners noted the importance of the human element in electronic recordkeeping. Certification processes work best once the records manager and system developer have

established familiarity and trust. Business process analysis may only be used while there is a champion encouraging its application. Some sites reported that progress in electronic records management turned out to be very dependent on the interests of individuals; when those people left the organization, the focus on electronic records management receded. While the importance of establishing trust and individuals as champions will not disappear, organizations can reduce the negative impact of losing critical people by documenting and enforcing a standard process that many people understand and use. Organizations can train all records staff to be comfortable with new electronic records processes, the language of IT, and the life cycle of information systems.

1.2.5 Recommendations

For NARA:

- Use the online Electronic Records Policy Working Group (ERPWG) Toolkit to publicize the best practices identified in this report
- Advocate agency certification of electronic recordkeeping requirements as part of the systems development life cycle
- Advocate integration of recordkeeping questions into business process reengineering as required by ITMRA
- Provide business analysis training to NARA records management staff so that they can assist agencies in the implementation of these processes
- Continue to use benchmarking of these and other records management processes as a tool to identify best practices and encourage their wide adoption

For Federal Agencies:

- Train records management staff in business analysis to encourage wide understanding of the systems development process
- Advocate more complete identification and implementation of recordkeeping requirements in new systems design
- Include records management in the business analysis and requirements-gathering processes for new systems
- Embed records management in the systems development life cycle and include the Records Officer as a stakeholder in system approvals
- Develop an electronic recordkeeping system certification methodology to meet agency needs

1.2.6 Conclusion

This benchmarking project identified several exemplary practices for two different yet complementary ways of ensuring that recordkeeping requirements are identified and met in new information systems design. Business process analysis can identify process-specific recordkeeping requirements that cannot be identified in any other way.

Certification of new information systems against a predefined list of recordkeeping functional requirements and other requirements that apply across the agency is the best way of ensuring that all important systems can handle their records appropriately. An agency that uses both types of process can feel confident that it is capturing the right electronic records for its business processes and that it is maintaining, protecting, and providing appropriate access to them in a trustworthy way. The Benchmarking Team believes that the methodologies described in this report provide a wide range of practical tools and models that could enable all Federal agencies, regardless of their current electronic records management and system development sophistication, to develop comprehensive policies and procedures for integrating records management requirements into new IT systems

2 Benchmarking Site Profiles

- 2.1 **National Archives of Australia. *Australian Standard (AS) 5090: Work Process Analysis for Recordkeeping*.** Available for purchase and download at: [http:// www.standards.com.au/catalogue/script/search.asp](http://www.standards.com.au/catalogue/script/search.asp)

Organization

National Archives of Australia (NAA). NAA maintains valuable records of the Commonwealth of Australia and ensures their availability for current and future generations. As the provider of national information management policy, it is also responsible for establishing recordkeeping standards that support government accountability to the public by ensuring that evidence relating to individual rights and entitlements is available and that future generations can access meaningful records of their past.

Within NAA, the Information Management and Information Communication Technology components of the organization's Corporate Branch provide basic support services for its other functional areas. Information Management develops recordkeeping policies, standards, and guidelines and provides training and advice that relate to modern recordkeeping. It was recently organized to focus on the intellectual framework of records management, e.g., classification schemes management, but it was also tasked with testing the policies of NAA's Digital Records Section (formerly known as the Government Records Section) by putting them into practice within NAA. For this reason, Information Management has worked closely with NAA's business units on business process analysis. Its involvement with Information Communication Technology in the review of business system redesign and functionality has also been growing.

Methodology

Australian Standard 5090, Work Process Analysis for Recordkeeping (AS 5090). Released in August 2003, this standard was developed by the IT-21 Committee on Records Management as a guide to undertaking work process analysis for recordkeeping purposes in support of *AS ISO 15489, International Standard on Records Management*. It has also proven useful as a supplement to the closely related NAA DIRKS Manual.⁶ Both the *International Standard on Records Management* and DIRKS recommend

⁶ In 2001, NAA released *DIRKS (Designing and Implementing Recordkeeping Systems): A Strategic Approach to Managing Business Information* to provide government agencies with practical guidance on managing business information and records by means of an eight-step methodology that addresses the improvement of recordkeeping and information management practices, including the design and implementation of new recordkeeping systems. Step B, *Analysis of Business Activity*, together with Steps A and C, comprise a suite of appraisal guidelines where Step A focuses on the business, regulatory, and social contexts in which organizations operate and Step C – as yet untested in the NAA environment – instructs on the identification and documentation of recordkeeping requirements for purposes of creating and maintaining evidence relating to business activities.

business process analysis as part of the second step of designing and implementing records systems, but neither offer detailed advice on how to do it. AS 5090 fills that gap.

AS 5090 complements functional analysis with sequential process analysis, and lays out five principal activities for conducting work process analysis: 1) identifying the sequence of actions within a process; 2) identification and analysis of variations; 3) establishment of a rules base for the identified actions; 4) identification of links to other systems; and 5) validation of work process analysis with participants. In addition to listing detailed steps for performing each activity and the outcomes the activity should produce, it links each step to a specific set of questions which allow the analyst to understand and map all aspects of the work process. The standard's non linear approach, using both functional and sequential analysis to identify dependencies, linkages to related records, and variations in work processes, helps assure that core business activities and transactions are thoroughly understood so that all recordkeeping requirements can be identified. AS 5090's instructions for both types of analysis and its methodological flexibility make it scalable as well, making it useful for a wide range of recordkeeping projects in many types of organizations and business processes.

Records management task supported

AS 5090: Work Process Analysis for Recordkeeping provides a methodology for performing a business process analysis from a recordkeeping perspective. The identification of recordkeeping requirements for information systems design is only one of the possible reasons records managers might use the standard. AS 5090 is designed as a further elaboration of Design and Implementation of Records Systems as outlined in *ISO 15489: Information and documentation – Records Management*, especially Step B: Analysis of Business Activity. As a work process analysis tool, it supports the identification and management of information/data/record flows; process standardization and codification of variations; identification and assessment of recordkeeping risks; regulatory compliance relating to work processes; integration of work processes and recordkeeping automation; and the development of the recordkeeping aspect of quality management systems.

Audience

AS 5090 (along with DIRKS Step B) is used primarily by Commonwealth agency information and records management project teams and consultants. Within NAA, Information Management currently owns the work analysis process, although there is the expectation that, following the documentation of business processes, NAA business units will discover wider benefits from applying these methodologies, as suggested above. The integration of systems designers from Information Communication Technology into the process would also be useful in the review of existing business systems and in the design new ones. Whatever the audience's composition, efficient functioning of the process requires the following participant skills: recordkeeping expertise and knowledge, deductive logic and analytical skills, motivation and determination, and interpersonal communications skills.

Benefits and Strengths

AS 5090's functional business analysis feature establishes a broad framework of organizational goals and objectives on which to base fully informed risk analysis and disposition decisions among multiple interlocking processes and records systems. In addition to its usefulness in developing records schedules and classification schemes, its outputs can serve a wide range of other records management objectives, such as those described previously.

The standard's blend of functional and detailed transactional process analysis, however, makes it a particularly powerful tool because of its flexibility, scalability, and the potential reuse of its products. Its approach helps in identifying dependencies, linkages to related records, and variations in work processes and assures that core business activities and ultimately, an organization's recordkeeping requirements, are addressed. Also, the standard's allowance for methodological flexibility depending on the nature of the business process under review, or the purpose of a specific recordkeeping project, make it scalable as well. The nature of the process determines the level of detail to which it needs to be broken down, so that highly technical and well-defined processes may be broken down more fully than less complex or well-defined processes – such as policy-making – which may be left at a fairly high level. Sequential analysis is especially useful in identifying detailed transactions and recordkeeping requirements for core and high-risk business activities that are unique to a particular organization.

Limitations

Applied for a large scale project or at a detailed level, AS 5090 is highly labor intensive. Information Management found that it took around three weeks of continuous work to thoroughly analyze one process. The cost of rigorous application of work process analysis may only be justified where business processes and related records are at particularly high risk, such as for processes under intense public scrutiny or undergoing major automation projects. At the time when we spoke to them, Information Management staff had only applied detailed sequential analysis to two of the National Archives of Australia's highest risk processes and they envision continuing to use risk analysis to prioritize future projects.

In Information Management's experience, the biggest hurdle for business process analysis was getting the right information. It was difficult to drill down into activities grounded in large volumes of assumed knowledge, particularly in complex processes where procedures had not been formalized. Information Management interviewers had to rely on their own logic and interpersonal skills plus the willingness of business unit staff to volunteer information in order to elicit enough detail for effective sequential analysis. Information Management staff members found that they could not rely on documentation alone; they had to probe for unstated and assumed knowledge. Gap analysis was

ultimately applied to define the difference between documented processes and the realities of the workplace.

Information Management staff members also found it useful to supplement the standard with concepts of their own, such as “transaction sets,” which they found made managing the non-linear relationships among groups of transactions easier.

Environment for which it is suited

Because of its scalability, AS 5090 has potential application in a wide range of organizations and industries ranging from the small and relatively simple, to the large and complex. Before embarking on a business process analysis and selecting relevant elements from this methodology, however, agencies should balance the costs, particularly of staff time and training, against project objectives and anticipated benefits. Agencies should also assess organizational support and organizational culture. High-echelon support is important in assuring that the analysis is undertaken and sustained through completion, that sufficient capital and human resources are available, and that program managers and their staffs cooperate in document collection and business unit interview activities. Support from key legal, IT, and information systems design offices is also critical, given the interdependency of their functions with records management.

In order to effectively manage a project of work process analysis for recordkeeping, records managers may need to acquire new skill sets, including interviewing and related communication skills, deductive logic, and analysis. The need for adequate staff training and staffing to avoid the burnout of analysts on an AS 5090 project can add significantly to project costs and resource requirements.

Significance to NARA

Because of its detailed and highly-structured guidelines on work process analysis in the recordkeeping context, AS 5090 is a worthwhile and technologically independent tool for identifying comprehensive recordkeeping requirements, including metadata requirements, that can be applied in the earliest phases of new systems design. The number of records management products that this standard supports, plus its flexibility and scalability, would allow any organization to apply it to as much of the organization and as intensively as necessary to get the results it desired. Organizations could use it selectively for key business processes and recordkeeping tasks, thereby avoiding potentially demanding labor and other resource commitments that the standard’s more expansive and intensive application could otherwise require. Although a fairly high level of expertise and sophistication is required to fully understand and apply AS 5090, it explains work process analysis thoroughly and the examples of practical application make it fairly user-friendly. The standard also decomposes the analysis process it describes into steps focusing on such tasks as analysis of process variation and identification of linkages to other systems and it provides checklists of specific questions for each step. The standard’s acknowledgement of business process variations, linkages,

and dependencies provide it with the flexibility and reliability needed for practical application in real workplace environments.

AS 5090: Work Process Analysis for Recordkeeping supplies practical guidance for aligning records management with business processes and ultimately for identifying the recordkeeping requirements of those business processes. For this reason, Federal agencies could use features of the AS 5090 methodology for application in their particular business and recordkeeping environments, especially for high risk situations such as automating business processes or fixing dysfunctional business processes. Federal agencies should decide which of their recordkeeping objectives could be met through application of work process analysis and then use cost-benefit analysis to determine which projects justify the significant commitment of staff time and other resources required. Because of the expense of information systems design, IT projects almost always justify the analysis necessary to identify all relevant requirements, but problems in any high-risk, high-accountability process might also justify this most detailed level of analysis.

2.2 Center for Technology in Government. *Practical Tools for Electronic Records Management and Preservation* (AKA Models for Action Tool). http://www.ctg.albany.edu/publications/guides/practical_tools_for_erm

Organization

The Center for Technology in Government (CTG). CTG is an applied research center in Albany, New York dedicated to improving government through the development of innovative tools and resources for policy, management and technology in digital government. CTG's funding comes from the State of New York through the University of Albany's budget and from grants and awards from foundations and Federal agencies. For the electronic records project NARA benchmarked, CTG received funding from the National Historical Publications and Records Commission (NHPRC) and conducted the project in collaboration with the New York State Archives. Because of its role as a research center, CTG develops and provides tools and guidance but does not enforce or monitor their use.

Methodology

Models for Action Tool. CTG and the New York State Archives conceived of the Models for Action project as a way to bring records management concerns to the center of business process design and analysis projects which were happening anyway. In this way, the Models for Action developers hoped to improve the records captured in information systems and the records' subsequent management. They found that the guidance available on electronic records management was written from an academic perspective and did not provide practical steps that IT professionals could understand and implement. *Practical Tools for Electronic Records Management and Preservation* lists six electronic records management goals that the tool helps achieve: "1. Bring the record to the forefront of system design activities. 2. Identify electronic records functionality as part of system design. 3. Create electronic records that support legal and evidentiary needs. 4. Create electronic records that are accessible and usable over time. 5. Integrate diverse document forms and formats into records. 6. Identify need for internal and external primary and secondary access to records."

The tool is based on a concise list of three basic functional requirements for electronic records management and preservation developed to communicate recordkeeping needs to IT and program managers in language they understand. The three functional requirements are Records Capture, Records Maintenance and Accessibility, and System Reliability. Each requirement includes several more detailed system requirements. In addition to the functional requirements, the Models for Action tool consists of components for Records Requirements Elicitation and a Records Requirements Implementation. Building on the three functional requirements, the Elicitation Component provides sets of questions for identifying the requirements associated with each functional requirement: the Business Process Level questions elicit requirements associated with records capture, the Record Level questions elicit requirements associated with records maintenance and accessibility, and the System Level questions

elicit requirements associated with system reliability. Each level's question set comes with a description of that level's objectives and guidance on the questions' use. The last step in the guidance for each set of questions is "Translate the requirements into system specifications." The Business Process Level questions rely on a detailed process map; participants answer the questions for each subtask of the process in question. The Implementation Component simply asks, for each requirement identified by the elicitation component, if it can be addressed with technology. If it can, it asks if policies or management practices will need to be developed or changed, and if it cannot, what policies and management strategies will allow the organization to meet the requirement.

Records management task supported

The Models for Action tool supports business process analysis from a records management perspective. The tools are written with the assumption that they will usually be used to gather requirements for new information systems, although they can be used for other process improvement projects as well.

Audience

The Models for Action tool is written for any governmental organization to use, and the guidance is universal enough to be used by any organization, governmental or not. The broad Functional Requirements which form the basis for the tool are designed to be easy for records, program, and technical staff to understand. The tool's focus on the business process allows for effective communication between program and records management staff. The primary goal of the questions in the Business Process and Systems levels of the requirements elicitation tool is to translate records management requirements into user and system requirements that can be easily communicated to systems developers in terms of technical specifications.

Benefits and Strengths

The CTG's Models for Action tool's focus on the business process provides a common language for discussing records issues that is meaningful to program, IT, and records managers. Users of the tool have found it easy to integrate records concerns with the business process analysis because important transactions or subtasks in the process naturally generate or modify information that needs to be stored. Use of the tool results in clear, usable system specifications and strategies for ensuring that all recordkeeping requirements are met through a combination of people, processes, and technology. The tool addresses policy and management processes outside the automated system and points out that not all recordkeeping requirements can be met by technology. The tool leads to a thorough elucidation and documentation of the recordkeeping needs of the process under review. It explicitly guides the analyst in thinking about areas of the current process that might not add value and could be streamlined. This is the only process we benchmarked that addresses process improvement in addition to analysis. According to the tool, subtasks that are candidates for streamlining include those that do not create or alter the record of the transaction in any way.

Limitations

Because the Models for Action tool was developed for use by any organization, it starts the process of analysis from scratch each time and relies on each set of process owners to correctly identify all the recordkeeping requirements applicable to their situation. Because of its scope, this methodology does not provide any explicit help in managing the systems development life cycle or ensuring that the identified requirements actually get built into the system. A limitation to this methodology noted by one of its developers is that it does not provide any solution to the problem of long term preservation of electronic records. The Records Maintenance and Accessibility functional requirement does specify that the system must provide the capability for records and metadata to be migrated to another system, but this alone does not guarantee that archival records will endure indefinitely. The number of unfamiliar acronyms in *Practical Tools for Electronic Records Management and Preservation* may also slow comprehension of this otherwise intuitive tool.

Environment for which it is suited

The Models for Action Tool could be used in the context of any business process analysis project and *Practical Tools for Electronic Records Management and Preservation* itself “strongly recommend[s] that the Business Process Level questions be answered in the context of a business process analysis or improvement activity.” (p.14) Since ITMRA requires Federal agencies to perform business process analysis and reengineering before requesting money for large IT projects, this process should already be happening throughout the Federal government. The Models for Action tool could easily be integrated into an agency’s procedures for carrying out the business process reengineering that is already taking place. It is possible, however, that many agencies do not have standard procedures in place for conducting these activities; many agencies hire contractors to manage reengineering projects and the contractors bring their own methodologies. In the absence of preexisting standard procedures, it would be more difficult to integrate recordkeeping questions into the business process analysis, but the best practice would be to establish standard guidelines for conducting analysis and reengineering and integrate recordkeeping into those guidelines. Until that could be done, records managers could publicize the existence of the tool and exert their influence to encourage IT and program managers to include the tool in the projects they undertake.

The Models for Action tool is most effective when the process owner understands the importance of records in the business process, is interested in conducting a business process analysis because of a significant commitment to implementing change, and has the necessary resources to conduct the business process analysis.

Significance to NARA

In the Models for Action, CTG has provided a simple, practical, flexible tool for integrating records management concerns into the very earliest stages of new systems design. Some form of business process analysis or business process reengineering should be happening anyway; records managers need to influence the way this activity is carried out to ensure that records concerns are addressed in new systems design. The recordkeeping requirements that are elicited by the Models for Action questions include critical process-specific needs, such as the components of the record and necessary meta data created, modified, or used at each stage of the process, who is authorized to create or modify a record, and whether any proofs of authenticity are associated with the content of the record. In the Record Level of the requirements elicitation tool, the questions prompt for information about characteristics of adequate evidence of a transaction, access restrictions, retention periods, and information needs of secondary users. Many of these recordkeeping requirements may be built into system specifications, but the tool also encourages its users to address policy and management processes that may also be necessary to ensure that all requirements are met. The kinds of process-specific requirements that this tool elicits are necessary information for all recordkeeping system development projects. All Federal agencies would benefit from a methodology such as CTG's to systematically identify requirements that describe the content, characteristics, and retention period of a complete record for every automated business process.

2.3.1 Minnesota Historical Society/Minnesota State Archives: *Trustworthy Information Systems Handbook* <http://www.mnhs.org/preserve/records/tis/tis.html>

Organization

The **Minnesota State Archives** is part of the Minnesota Historical Society. Neither the Minnesota Historical Society nor the State Archives are units of the state government. The Minnesota Historical Society's major lines of business are library/museum operations, operating the state historic preservation office, operating the state archives, and operating historical sites statewide. The State Archives collaborates with many state agencies, local governments, and other partners to acquire historically valuable state government records.

The Minnesota State Archives is not responsible for records management in the state government and has never offered records management services for state agencies. Centralized records management policies, procedures, and oversight is a responsibility of the Department of Administration, and is usually implemented at the agency level by designated records staff on either a full-time or limited-duty basis depending on the needs of the agency. Statewide IT policy and support is located in the Office of Technology, and is fairly decentralized. IT governance in the state oscillates in position and authority with changes in administration, and is sometimes complicated by staff turnover in the Chief Information Officer's office. Most records management and electronic records management is done on an agency-by-agency basis. The State Archives received formal support and backing from the state administration to develop electronic records management guidelines and the *Trustworthy Information Systems (TIS) Handbook*, but a variety of agencies also cooperated generously in the effort. The National Historical Publications and Records Commission (NHPRC) provided funding for the project.

The *TIS Handbook* is very much a "do it yourself" guide to developing new IT systems and developing appropriate electronic recordkeeping requirements. The State Archives developed TIS and several other tools that agencies can use on their own, as they see fit, to meet their business needs. The Archives meets with customers and stakeholders in agencies as an advocate, but not to "do" records management or electronic records management. Rather, their focus is on advocacy, education, discussing problems, identifying needs, finding ways to collaborate, and in pointing to or in some cases developing tools (such as the *TIS handbook*) agencies can use themselves to successfully accomplish electronic recordkeeping and assure that trustworthy IT systems are developed.

Methodology

Trustworthy Information Systems (TIS) Handbook. Electronic recordkeeping requirements and trustworthy system design are accomplished by using TIS to help determine what system and recordkeeping requirements are appropriate within the business context, e.g., by determining what system and recordkeeping functionality is "trustworthy enough" for the specific business environment. The *TIS Handbook* outlines

a decision-making process for building trustworthy systems that is based on meeting agency, public accountability, and business needs. Recordkeeping requirements are included in a larger list of business requirements because TIS is used as part of a broader business process analysis, which is not limited only to recordkeeping. The handbook helps systems developers, program managers and staff, records managers and others develop trustworthy systems that support accountability of officials to citizens and to protect legal rights. The *TIS Handbook* guides users through a six-step process to assure that trustworthy IT systems are developed and that they produce authentic, reliable, and accessible information.

Records management task supported

The *TIS Handbook* contains questions that encourage analysis similar to that done during business process analysis and also provides a checklist of criteria for trustworthy information systems, so it is a hybrid of both approaches. It offers a “do it yourself” approach and does not assume that the TIS process will be incorporated into a formal agency systems development life cycle or electronic recordkeeping certification process. The TIS is available to all potential users online (at <http://www.mnhs.org/preserve/records/tis/tableofcontents.html>), and the State Archives recommends that all state agencies use it when they are designing new IT systems. The Archives works with TIS users when there is a good reason to do so and if challenges, opportunities, and resources warrant. In these cases, Archives staff may be brought in to provide broad advice or assistance to the project, or educate users about electronic records that are potentially permanent and would be candidates for the Archives.

Some of the criteria agencies might use to build trustworthy information systems are an examination of the agency’s legal profile for risk, whether or not information is being passed across administrative boundaries, whether the system is part of a major e-government project, and whether the agency has been sued or if previous or pending litigation has identified serious recordkeeping or electronic system weaknesses. Ideally, the Archives recommends that agencies regard TIS and the development of electronic recordkeeping requirements in terms of a larger business process analysis project. TIS can be used as a component of a business process analysis project when recordkeeping is a topic of discussion or an identified business need. Ideally the business process analysis project team is aware of TIS and electronic recordkeeping from the beginning, and can plan for it to be included appropriately in the analysis process. Using the *TIS Handbook* can also be iterative as well, starting with an awareness of recordkeeping concerns at the beginning, and leading to a series of discussions or decisions in the systems development process to identify recordkeeping and IT system requirements as they arise.

Audience

The *TIS Handbook* is useful to information systems developers, policy makers, program managers, records and information managers, and current and future system users; it helps them develop trustworthy information systems that can support accountability of elected officials to citizens by creating reliable, authentic, and accessible information and records. The handbook encourages collaboration among a variety of people with diverse

sets of skills and expertise. Ideally, teams of agency personnel with a range of skills and knowledge will work together in this process. The team should include people who have: knowledge of agency and local government business, policy, and procedures; knowledge of information access and data practices; and skills in computing, information technology, and information systems design.

Benefits and Strengths

The *TIS Handbook* is a very well-written and non-technical handbook that is easy to understand for people with little or no recordkeeping knowledge or IT systems development experience. Its “do it yourself” approach appeals to agencies that do not have elaborate IT infrastructures or staff with knowledge of electronic records management. TIS may be an excellent mechanism for records managers to invigorate an electronic records program that is not adequately supported, or for records managers to lead or participate in a TIS project team. The handbook itself is only about 35 pages long (excluding the glossary, a very extensive bibliography, and the appendices). It is very user-friendly, written in short sections that are non-technical, clear and to the point, and which require almost no further interpretation to understand the methodology. Further, it is very well structured, using sidebars titled “Did You Know” and “Consider This” to illustrate important points and to provide examples. It does such a good job explaining the importance of electronic records management to an IT audience that the handbook could be used by records managers as a communication or education tool for IT staff.

The TIS questions and checklist encourage a team approach to identifying system and recordkeeping requirements, examining the business process, and building trustworthy IT systems. Following the checklist and responding to the questions leads the team through a modified business process analysis project, as well as an electronic recordkeeping requirements definition project.

TIS “Section 9: Criteria for Trustworthy Information Systems” is very good at explaining specific criteria such as system documentation, security, audit trails, disaster recovery plans, and metadata. The TIS “Appendix E: Legal Issues Affecting Electronic Records Management” is particularly strong in examining legal issues such as inappropriate destruction of records, evidence, discovery, privacy, intellectual property, and the like. There is a separate Legal Risk Analysis Tool that is available online at <http://www.mnhs.org/preserve/records/tis/Legalriskoptions.html>. While this legal risk tool is specifically written from the perspective of Minnesota laws, it is framed in a general way so as to be helpful to anyone in the litigation, risk management, and records and information management professions.

Limitations

For environments where records management has a strong presence and there are rigorous electronic records management and system development procedures already in place, TIS may be too user-friendly and customer-centric. For instance, with a “do-it-yourself” guide there is a possibility that professional records and information managers

will be left out of the systems development picture entirely, without representation on a TIS project team. Some TIS users may not see the TIS criteria as especially important in helping identify their business needs, and the flexibility and self-service nature of TIS leaves the decision on using the criteria and the handbook up to them.

Environment for which it is suited

Because of its clarity and good explanation of why trustworthy information systems are worthwhile, TIS could help records managers communicate with IT staff and establish a good working relationship between the two groups. TIS is ideal for organizations that are planning an IT system with no formal process to serve as a guide, have limited resources, or have not thought in depth about their business needs, trustworthy IT systems, and their electronic recordkeeping requirements. TIS would work very well in environments where there are decentralized IT development policies and procedures, and in organizations that do not have formally developed systems development life cycle procedures or enterprise architecture considerations. It should be noted, however, that all of the TIS concepts can also be readily integrated into more formal IT development procedures, and used in highly structured IT shops, and by the professional IT staff who are usually responsible for systems development and architecture.

Significance to NARA

The *TIS Handbook* is a practical, easy-to-understand guide for developing trustworthy information systems in any organization, but especially in those that do not already have a sophisticated, standardized systems development program. Although TIS was developed for the State of Minnesota, it could be adapted for other legal and regulatory environments. (It has already been adapted by other states.) TIS could easily be used to develop new IT systems in small or medium-sized organizations, and could be adopted as a standard or guideline for use by contractors, IT staff, program staff, and senior managers to assure that electronic recordkeeping requirements are considered in the systems development process. Of special note is the “hybrid” approach used by the *TIS Handbook* to conducting both a business process analysis project and using a checklist of predefined electronic recordkeeping requirements. While TIS does not utilize a formal business process analysis methodology, the TIS questions, checklist, recordkeeping criteria, and the Legal Risk Analysis Tool integrate many of the most significant elements of a formal business process analysis into the development of trustworthy information systems.

2.4 Federal Bureau of Investigation: *Electronic Recordkeeping Certification Manual*. Available from the FBI.

Organization

Federal Bureau of Investigation (FBI). The mission of the FBI is to uphold the law through the investigation of violations of federal criminal law; to protect the United States from foreign intelligence and terrorist activities; and to provide leadership and law enforcement assistance to federal, state, local and international agencies. Records management policies and procedures that ensure the proper creation, maintenance, use and disposition of records are critical to achieving the FBI's mission. In the transition from paper to electronic recordkeeping, the FBI recognized that it needed a methodology to ensure that electronic records are managed in compliance with all applicable recordkeeping laws, regulations, and policies.

The FBI Records Officer has the authority to determine what FBI information constitutes a record under Federal Law and the authority to approve, or withhold approval of, any electronic information system in use or in development. No electronic information system is authorized for use in the conduct of FBI business without the approval of the FBI Records Officer. The records officer's highest priority is to ensure that appropriate records management requirements are incorporated into IT system specifications and validation tests when new information systems are developed. When possible, the FBI will also review existing systems for compliance with records management requirements and will address any deficiencies identified.

Methodology

FBI Electronic Recordkeeping Certification (ERKC) Manual. The FBI created the Electronic Recordkeeping Certification process to ensure that the information systems the FBI develops and maintains comply with statutory and agency electronic recordkeeping requirements. The ERKC process incorporates electronic recordkeeping requirements into the agency's system development life cycle so that all system development activities appropriately consider electronic recordkeeping issues from project conception through post-implementation reviews. The *ERKC Manual* describes the process used to evaluate system compliance with records management criteria, and is based on best practices such as those contained in DOD 5015.2-STD. The process is designed to guide system sponsors and developers in assessing and incorporating records management criteria into system requirements specifications, and then ensuring fulfillment through a review of documented system test results. The ERKC process consists of identifying systems that contain records, helping system owners and developers understand ERK criteria, ensuring that system requirements specifications satisfy ERK criteria, and validating ERK functionality through review of system test results.

Records management task supported

The FBI ERKC process supports the systems development life cycle by incorporating electronic recordkeeping requirements in the system planning and development process. Specifically, the FBI's *ERKC Manual* and the validation processes meet these goals by providing specific instructions for including requirements in four major phases of system design: project definition, in which one of four potential strategies for managing electronic records is identified, verification that the system design incorporates recordkeeping criteria, validation that the system as built does meet the requirements and can be given a certification of Approval to Operate, and finally, post certification review to ensure that systems continue to meet recordkeeping requirements throughout their active lives.

The recordkeeping requirements for IT systems are evaluated for compliance during the ERKC process through formal reviews at five review boards which serve as control gates in the systems development life cycle and ERKC processes.

Audience

The FBI's ERKC process is designed for use by information systems sponsors, IT system owners, IT system developers, records management professionals, and other information management professionals. The FBI records officer is responsible for certifying information systems and for coordinating the certification process with business units and system developers.

Benefits and Strengths

The ERKC process ensures that electronic recordkeeping functionality is incorporated into all new and updated information systems in a formal, structured way. The *Electronic Recordkeeping Certification Manual* is a detailed and extensive guide to the certification process itself and the criteria for certification, contained in Appendix C along with sample tests and expected test results for each criterion. Representatives from the Records Automation Section sit on all five information technology boards within the Bureau: Enterprise Architecture Board; Information Technology Review Board; Investment Management Project Review Board; Information Technology Policy Review Board; and the Information Technology Advisory Board, to assure that all ERKC requirements are met and that all systems are certified prior to final deployment. These review boards function as control gates to assure that all IT system and functional requirements (not just electronic recordkeeping requirements) are incorporated into the new system. The FBI's certification process gives the Records Officer the authority to withhold approval to operate from a system that does not meet necessary recordkeeping requirements. This is a strikingly strong formulation of independent records management authority over systems development.

Limitations

The FBI's ERKC process, although effective, requires many hours of records management staff time to implement fully. Staff members report that it can take around 120 hours of staff time to do a full analysis. The FBI hopes to add more staff members to the Records Automation Section in order to devote more time to the ERKC process. Because the records management staff now need to track the progress and status of many systems in all stages of development, they found that they also needed new tracking and management tools to support the ERKC process. In the future, staff members would also like to be able to provide accurate estimates of the costs of long-term electronic records storage so that cost could be built into the initial capital request.

The ERKC process, because of its focus on system functionality, would not itself identify all process-specific recordkeeping requirements that could be identified and defined in a business process analysis project. It provides assurance that the system can manage records appropriately, but does not attempt to address whether or not the right records are captured.

Environment for which it is suited

The FBI's ERKC process works best in large, sophisticated operations where IT systems development and records management operations are well integrated into the IT infrastructure and agency business processes. Another significant requirement is the need for a sustained commitment by the CIO and senior agency management to support the ERKC program and provide appropriate resources to assure its long-term success. It would work best in agencies with good communications between the IT and RM programs, and with program managers and staff in agency business units. To use the ERKC process, agencies need to develop an appropriate standards-based IT infrastructure to support enterprise-wide initiatives such as ERKC. The FBI certification process requires a highly skilled and professionally trained records management staff with a high-level commitment over the long haul to successfully develop and implement the process, and to integrate it into the agency's system development procedures and the IT and records management infrastructures. Because a full-blown ERKC analysis can take so much staff time, it may be necessary to prioritize which systems get intensive analysis by using risk management and other factors if the necessary resources (possibly in the form of contractor support) are not available for certifying all systems.

Significance to NARA

In the transition from paper-based to electronic recordkeeping, there is a shift in emphasis from direct management of a record as a physical object towards the design of the infrastructure in which records are created, captured, and managed by integrating a variety of processes and procedures that involve the individual end user, agency management, and technology (the critical trio of people, processes, and technology). For records management and IT staff, this shift in emphasis is likely to require a new range of records management skills to manage records in new kinds of systems in new contexts, for as long as they are needed. For organizations, this involves the development of multi-

skilled and multi-purpose project and operational teams that bring together a range of different skills and expertise. In an electronic recordkeeping environment, new skills and responsibilities are also required of end-users as the creators and users of records. They will have greater responsibility for correctly identifying and dealing with records in their earliest stages of creation, which will require a significant cultural change in attitudes and behavior towards creating and managing records. Finally, agency management must assure that appropriate policies, procedures, and training are in place to support electronic recordkeeping. The ERKC is one of a number of steps the FBI is taking now to address how it will manage people, processes, and technology in its move to all-electronic recordkeeping.

The fact that the *Electronic Recordkeeping Certification Manual* is detailed, comprehensive, and explicit would make the FBI's process a relatively easy one for another agency with the right records management and IT relationship in place to understand and use as a model. The fact that the criteria laid out in the manual and the basic structure of the process are fairly universal (rather than highly customized for the FBI) would also make this process relatively easy for another agency to adapt for its own environment.

Because all agencies are confronting the challenges of using information systems as recordkeeping systems and many agencies could probably learn from the FBI's work, NARA gave the FBI's new ERKC process a Best Practices Award at NARA's 2005 Records Administration Conference (RACO).

2.5 Central Intelligence Agency: *Electronic Recordkeeping System Requirements and Certification Process.*

Requirements document available at
http://www.foia.cia.gov/info_management.asp

Organization

Central Intelligence Agency (CIA). The CIA's primary mission is human intelligence collection and all-source intelligence analysis to ensure the national security of the United States and the preservation of American life and ideals. To accomplish its mission, the CIA engages in research, development, and deployment of advanced technology for intelligence purposes. As a separate agency, CIA serves as an independent source of analysis on topics of concern and works closely with other intelligence organizations to generate the best intelligence possible.

The CIA is organized into four major directorates plus the Center for the Study of Intelligence. The Directorate of Support provides the mission critical elements of the Agency's support foundation: people, security, information, property, and financial operations. The ERKS program office, which manages the ERKS requirements and certification process, is located in this directorate.

Methodology

CIA Electronic Recordkeeping System (ERKS) Requirements and Certification Process. The purpose of the ERKS requirements document and the certification process is to allow the Central Intelligence Agency to effectively manage and exploit its records and other information assets through the creation of electronic systems which can adequately capture, manage, and manage disposition of electronic records in accordance with applicable laws and regulations. The ERKS requirements document identifies the functional information management requirements for new and legacy information systems. As stated in the purpose statement of the requirements document, "These requirements support a uniform approach to: the protection of information integrity; the collection and display of required metadata; the preservation of agency data over time; the maintenance of record material electronically; and the regular and lawful disposal of information that is no longer needed."

The ERKS process was first developed in 2000 but was substantially revised in 2004 as part of the development of an agency-wide effort to standardize the system development process. In 2004, the CIA integrated all stakeholders into control gates for review of each stage of the systems development process. Because the 2000 version of ERKS was already available, the CIO naturally included the Information Management Officer as a stakeholder and incorporated the ERKS requirements with the other sets of requirements provided by other stakeholders. The ERKS requirements certification process is a structured process applied to all new and upgraded applications and systems that go through the overall system development process. It ensures that these systems all incorporate the necessary ERKS requirements, which are based on a streamlined set of

DOD 5015.2-STD requirements, into the overall requirements documents for the systems. As part of the ERKS process, system owners work with Information Management Officers to develop Information Management Plans that document the system and its records and outline the processes necessary to maintain, destroy, and migrate the records appropriately.

The Information Management Officers in the business units obtain published documentation for proposed IT systems such as the Concept of Operations Plan, business and system requirements documents, ERKS Certification proposals, and develop the Information Management Plan. The ERKS staff meets with business unit Information Management Officers, business unit representatives, project technical staff, and developers to assist in the development of the Information Management Plan. Information Management Officers meet informally with program staff to understand the project scope and define requirements, and then develop draft ERKS requirements. Information Management Officers meet once again to review the draft requirements document before the documents are submitted to formal review boards such as the System Requirements Review, Design Concept Review, Preliminary Design Review, Critical Design Review, Test Readiness Review, and Deployment Readiness Review. The review boards bring all of the system requirements together for formal review, approval, and traceability throughout the planning and system-build process. The Information Management Officers use the requirements traceability matrix for documenting and validating ERKS Certification. They also conduct a follow up test of all electronic recordkeeping requirements in the system.

Records management task supported

The CIA ERKS requirements process supports the systems development life cycle for electronic recordkeeping by identifying the CIA's baseline set of recordkeeping requirements for information systems and building them into the system development life cycle. The goal of the ERKS certification process and the resulting Information Management Plan is to identify requirements and processes necessary to ensure that agency information systems are designed and maintained in such a way as to create, retain, and dispose of records in accordance with the business and legal needs of the organization.

Audience

The CIA's ERKS certification process is designed for use by information systems developers, business unit staff, records management staff, and other information and records management professionals. It also relies upon a knowledgeable, well-trained and widely-dispersed records management staff of Information Management Officers that are deployed throughout the agency business units and well integrated into the CIA's IT systems development business processes. The Information Management Officers are able to assist in the ERKS requirements and certification process and in developing the Information Management Plan.

Benefits and Strengths

The CIA's ERKS process is effectively ensuring that recordkeeping system requirements are routinely identified and incorporated in new and upgraded systems through a very thorough integration of records management as a stakeholder in the standard systems development process. Although the ERKS process requires significant records management staff time, including ERKS in the overall systems development life cycle has not had a negative impact on project schedules.

The CIA's very short and unintimidating handbook and the streamlined list of requirements have made it relatively easy to convince system developers to use the ERKS process. The network of Information Management Officers in the business units provides a way of supplementing the short handbook with human expertise in the process.

The Information Management Plans are a formal, structured method of documenting processes outside the system that are required to protect records for as long as they must be retained.

Limitations

The ERKS requirements process is not designed to identify all process-specific electronic recordkeeping requirements that would be identified and defined in a business process analysis project.

The ERKS requirements are a streamlined subset of the more extensive set of recordkeeping requirements found in DOD 5015.2-STD for records management applications so they do not include all the detailed requirements found there, although the CIA process does provide for a way to incorporate requirements that may exceed the baseline depending on the business process and how the IT system will be used.

The way the standardized systems development process is set up in the CIA, system development project managers rather than program staff members work directly with the ERKS process and become familiar with electronic recordkeeping concepts. CIA records managers feel that they may be missing an opportunity to educate business unit staff about their ongoing responsibilities for the electronic records in the system. Now that the ERKS process to include recordkeeping requirements in new systems is working smoothly, though, the ERKS program staff members hope to be able to devote more time to post-development educational activities in the future.

Environment for which it is suited

The CIA's ERKS process works best in a large, sophisticated operation where IT systems development and records management operations are well integrated into the IT infrastructure and agency business processes, and there is a long-term commitment by senior agency management to support the program and provide appropriate resources to assure its success. It would work best in agencies with good communications between the IT and records management program areas, and with program managers and staff in

business units. To support the process, an agency needs to develop an appropriate standards-based IT infrastructure to support enterprise-wide initiatives such as the ERKS requirements and certification process. The CIA's certification processes require a highly skilled and professionally trained staff to implement the process and supplement the short handbook with their expertise. A process like this also requires a high-level commitment over time to integrate the process into agency's enterprise architecture, system development lifecycle procedures, and the IT/records management infrastructure.

Significance to NARA

The CIA's *ERKS Requirements* and certification process are an effective way of ensuring that recordkeeping requirements are built into every new or updated IT system that contains Federal records. As with the FBI, the CIA process utilizes requirements found in DOD 5015.2-STD, which NARA has endorsed for use by all Federal agencies. The CIA found that Version 1 of their ERKS process, which included all of the DOD 5015.2-STD ERK requirements and was presented in a handbook of approximately 130 pages, was very complicated and burdensome for IT system developers to use. The CIA found that the level of complexity served as a barrier to necessary cooperation and full implementation. The current, more streamlined, version of the process has been easier to use and more readily accepted throughout the agency.

2.6 U.S Patent and Trademark Office: *Electronic Records Management Technical Standard and Guideline* (ERM-TSG). Available from USPTO

Organization

U.S. Patent and Trademark Office. The mission of the U.S. Patent and Trademark Office (USPTO) is to examine and issue patents and trademarks and administer all applicable laws pertaining to patents and trademarks. The records of USPTO are crucial to protecting the legal rights of patent and trademark holders, with severe penalties to those who infringe upon their rights. USPTO must protect these rights as long as they endure, as well as preserve the records for every patent and trademark to enable the examination of “prior art” for current applicants. Consequently, the development and implementation of sound records management policies and procedures ensuring the proper disposition of USPTO records are vital to the mission of the agency.

Records Management and IT at USPTO fall under the purview of the Office of the Chief Information Officer, Office of Data Architecture and Services, Data Administration Division. Under this structure, the agency Records Officer and the Electronic Records Team Leader serve as consultants to the business units and the IT offices regarding the development of new electronic systems. They have no direct enforcement powers to approve or withhold approval of any USPTO automated information systems. Their Director, however, is able to enforce some level of compliance through the Technical Review Board upon which she sits and which governs the IT life cycle. The manager of the Division also enforces records management requirements through the Data Management Plan that all IT projects must prepare and adhere to through their life cycle.

Methodology

USPTO created the *Electronic Records Management Technical Standard and Guideline* (ERM-TSG) to ensure that all new USPTO automated information systems comply with statutory and agency recordkeeping requirements. ERM-TSG provides detailed instructions for the preparation of a requirements checklist for electronic records management. With the ERM-TSG in place, the agency Records Officer and Electronic Records Team Leader are able to help business units and IT staff members incorporate recordkeeping requirements into the lifecycle of new systems. They work cooperatively with the business units to encourage records management functionality and insert records management in the data management plan for new automated information systems. They often address electronic records management issues with the business units and the IT offices if electronic records are included in the new system. New systems are usually identified using the USPTO Strategic Information Technology Plan, and by reviewing Data Management Plans that have been submitted to the Technical Review Board for approval. Furthermore, the agency records officer is invited to business unit and data management meetings and is given the opportunity to explain the risks of not including records management functionality, and the business units conduct a cost-benefit analysis on mitigating the risks. The cost benefit analysis is essential to the development of new

systems at USPTO, as not all electronic records management requirements may be feasible or necessary.

System developers along with Business Area Record Stewards review the recordkeeping requirements in the thirteen major electronic records management categories listed in the ERM-TSG and determine which of them will apply to the new system. Not all thirteen areas of consideration pertain to each automated information system – the developer determines which are applicable and what needs to be built into the system to meet the applicable requirements.

Records management task supported

The USPTO ERM-TSG supports the systems development life cycle for electronic recordkeeping. The ERM-TSG is a tool used by the business units and system developers to ensure that recordkeeping requirements are incorporated into new USPTO systems. In addition, the ERM-TSG defines the legal requirements that system developers and business unit managers must adhere with respect to the development of any new electronic systems.

Audience

The USPTO ERM-TSG process is designed for use by System Development Managers, System Maintenance Managers, Project Managers, Systems Managers, Business Area Record Stewards, Operational Record Stewards, and Technical Record Stewards within USPTO.

Benefits and Strengths

The *Electronic Records Management Technical Standard and Guideline* clearly lays out the roles and responsibilities of everyone involved in the design, development, and implementation of electronic systems with respect to recordkeeping requirements. The ERM-TSG identifies recordkeeping requirements in the form of a checklist that all systems developers must fill out. The IT staff is familiar with the requirements and finds them easy to use. The business units are beginning to see electronic records management as a need, and are asking for it in their systems. More importantly, ERM-TSG ensures that electronic recordkeeping will be incorporated into all new electronic systems. No new electronic systems can be developed without first receiving approval from the Technical Review Board, which ensures that all of the ERM-TSG requirements are met and adhered to prior to implementation of the system. Another of the standard and guideline's great strengths is that it includes a combination of requirements for recordkeeping functionality and process-specific records requirements, such as case file metadata. The process takes full advantage of the fact that many requirements for records and case files are stable across many patent and trademark processes and only need to be identified through business process analysis once. Thus, USPTO's standard and guideline provides some of the advantages of business process analysis in a process that integrates records management into the systems development life cycle.

Limitations

The limitations reported by USPTO records management staff members are that electronic records management is still not perceived as a business requirement by all of the IT staff. This is primarily a cultural issue, and more records management training needs to be conducted in the Office of the Chief Information Officer. Furthermore, limited resources often hamper the ability of USPTO to implement the program as fully as they would like. The Records Officer does not have the authority to approve or withhold approval from a system in the same way that the FBI's Records Officer does as part of their certification process, although records management has significant influence through the Technical Standard and Guideline, the Data Management Plan, and personal contact.

Environment for which it is suited

The ERM-TSG is best suited for a fairly large agency that has received high-level management support including support from the CIO for incorporating recordkeeping requirements into new electronic systems based on the business processes involved. The USPTO's program could be most easily adapted by agencies that have a good, cooperative relationship between records managers and IT personnel.

Significance to NARA

The *Electronic Records Management Technical Standard and Guideline* complies with all laws, regulations, statutes, and standards that mandate and support records management and electronic records management in the Federal Government, including DOD 5015.2-STD, which was endorsed by NARA. The USPTO ERM-TSG could serve as an excellent model for other agencies with similar records management and IT structures. The degree to which USPTO has crafted this guideline for the unique needs of its patent and trademark business processes makes this standard an excellent model to emulate but would also require that another agency do extensive customization of the model to suit its own distinct business needs.