

# Guidelines For Determining If A Stand-Alone Imaging System Is The Best Choice for You

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## Introduction

Many state and local government agencies are investigating ways to redesign business processes to improve services and operations. Records are an integral part of business processes, and most attempts to improve services involve rethinking the way records are created and managed. Most documents created by or filed with governments are produced on paper. Digital imaging systems allow for the capture, storage, indexing, retrieval, distribution, and display of an electronic image of the original document. Therefore, such systems are often considered an attractive technology solution for a variety of records management problems.

Appropriately implemented imaging systems *can* help government agencies improve records access and retrieval, ensure file completeness, automate work flow, and integrate paper-based documents with electronically based information such as spreadsheets, databases, and word processing files. But imaging systems implemented with insufficient planning can become costly, and can actually have a negative impact on services and operations. Successful imaging implementation begins with a clear identification of problems followed by an exploration of the variety of ways the problems

might be solved. If imaging offers a promising solution, a determination of whether a stand-alone or component-based system will best meet your needs can then be made.

State agencies and local governments have long been interested in electronic imaging systems in general, and interest in stand-alone imaging systems has recently shown a dramatic increase. The New York State Archives and Records Administration (SARA) is committed to helping government agencies make appropriate technology choices. SARA has developed these guidelines to familiarize you with stand-alone imaging systems and to help you determine if such a system will meet your needs.

## **What are turnkey or stand-alone imaging systems and how do they compare to other imaging systems?**

**Turnkey or stand-alone imaging systems** come complete with all of the hardware and software necessary for scanning, indexing, storing, and retrieving documents. A typical turnkey system includes a PC, a high-resolution color monitor, and a sheet feed or combination flatbed/sheet feed scanner. The scanner can handle documents up to 8.5" by

14". Images are stored on an optical disk. Jukeboxes, which allow for automatic retrieval from several optical disks without manually inserting disks, may also be available at additional cost if storage needs exceed the capacity of the base system. Stand-alone system vendors sell the hardware and software, install the system, and provide training and system support.

Stand-alone systems are often referred to as "electronic filing cabinets" because they operate strictly as file storage and retrieval systems. They are not designed for applications in which documents need to be routed and processed after they are imaged. Stand-alone systems can be networked so that several people at once can have access to the files, but images cannot be routed from workstation to workstation as part of a work process. Also, the number of people who can access documents at one time is limited because document retrieval times may degrade as the number of users increases.

Imaging applications that require routing and processing of documents are usually developed using hardware and software components from a variety of vendors. This is possible because the components adhere to industry standards (for more information on industry standards, see Appendix A, Office for Technology [formerly the Governor's Information Resource Management Task Force] - **Technology Policy 96-16A**). Systems integrators who have relationships with many vendors often develop these systems. The integrator's job is to find and use the best technology available for the application. In addition, these systems, because of their standardized nature, are often integrated with existing office automation tools such as e-mail, groupware, and word processing.

### **Where do I begin?**

Imaging, like any other technology, is a tool for solving business problems. All projects need to begin with identifying and analyzing the problem to be solved. This analysis can range from simply developing a clear description of the problem and its root causes to a full business process analysis. Whatever the approach, the following questions should be answered:

- What are the characteristics of the problem?
- What resources might be available to solve the problem?
- Who will be affected by the project's result?
- How will you know the problem is solved?

In pursuing a solution, you should be familiar with all possible technical options. Explore the range of technological solutions. Get an overview of technical and professional research related to the problem. Identify how specific business objectives have been addressed in other real-world settings. It is important to keep in mind that solutions will often have managerial and policy as well as technological components. Changes in management practices and policy, and variations in business processes, should be part of an overall solution.

### **Is imaging the solution?**

Imaging can be an effective technology for providing quick and easy access to records originally stored or received in paper form. Imaging can allow for multiple access to these records, as well as *parallel processing*, where two workers can perform tasks involving the same records at the same time. Imaging can be a tool for improving work processes, maintaining files, and integrating

information originally in paper form with other information resources (e.g., databases, word processing documents, spreadsheets, etc.). Space-saving is often cited as an advantage of imaging systems. However, the cost of an imaging system can rarely be justified by space-saving alone, because cheaper solutions (e.g., a records storage facility, a micrographics program) can better address this problem. Similarly, imaging may be a poor choice for providing access to records via the Internet or preserving long-term electronic or paper records. SARA strongly urges government agencies to undertake a needs assessment before making decisions on implementing any imaging solution. The results of this analysis should be used to select technologies that fit the defined business needs. Examples of the types of questions that should be considered in a needs assessment are contained in Appendix B. In addition, SARA also recommends that you undertake a feasibility study to precisely determine your organization's capabilities to implement and sustain a technical solution. The availability of resources to purchase, implement, and maintain a technology are crucial. Too often officials neglect to take into account the ongoing costs of sustaining and effectively using a technology.

### **Is a stand-alone imaging system right for you?**

You must identify your own business requirements to answer this question. A needs assessment will help you accomplish this. The key questions for determining if a stand-alone system will meet your needs are:

### **What are the problems with your current system and what would you like the new system to do for you?**

- A stand-alone system may be a good fit if the problems with your current system are related exclusively to document access issues, such as not being able to find documents or access them quickly enough to meet customer needs or expectations.
- A stand-alone system is not likely to be a good choice if your goal is to improve paper-bound work processes by converting paper to digital images, automating the routing of documents or workflow, and/or integrating images with other automated tools.
- If your goal is to simply eliminate paper files to gain more space, digital imaging in any configuration is probably not the best solution. This is especially true if the records you want to image have long-term retention periods and are infrequently used. There are other ways to store inactive documents that are less expensive and less risky. The real benefits of imaging are gained from its ability to increase access and improve work processes.

### **Are any elements of your current system automated?**

- If records are being initially created in electronic form, imaging may not be advisable. Development of electronic filing structures, elimination of duplicate paper records, or other document management technologies may provide better solutions to your specific problems.
- If you have a local area network (LAN) or computers already installed, you may

not need to purchase a complete stand-alone imaging system. A component-based system may be a better choice. You will need to determine if the system under consideration is compatible and be easily integrated with your existing equipment.

**What are the document characteristics? Will microfilm need to be converted to make the system sufficiently operational?**

- Stand-alone systems are designed to handle typical office documents.
- Stand-alone systems are not a viable option if you need to convert odd-size documents or microfilm.

**How will you need to use and access the documents?**

- If a limited number of staff needs access to documents at the same time, a stand-alone system may be a good choice. As mentioned earlier, the retrieval performance of stand-alone systems may degrade as the number of people using the system at the same time increases.
- If many people need access to the documents and document images must be routed as part of a workflow process, a component-based system is a more appropriate choice.

**What level of computer support does your office have?**

- Stand-alone system vendors install and maintain the complete system and provide user training. For this reason, stand-alone systems may be a good option for offices that have little or no computer support. However, because

these systems are proprietary in nature, the vendors must perform all upgrades. Vendors charge for these services. Therefore, ongoing maintenance of a stand-alone system can be more costly than maintenance of a component-based system.

**Other questions...**

There are other questions that apply equally to stand-alone and component-based imaging systems.

**What are the retention and disposition requirements for the records involved?**

- Regardless of the type of imaging system you choose, you must be prepared to maintain records for as long as needed to meet legal, fiscal, administrative, and archival requirements. Therefore, any system you implement should store images in the standard TIFF 4 format (Tagged Image File Format). This will allow you to migrate the documents to newer versions of the system or to another system if necessary. To maintain access to the documents, the index to the images also must be migrated. This may be more difficult than migrating the images, because indices are often proprietary. For more information, see SARA's *Guidelines on Long-Term Retention of Imaged Records* (access this document on SARA's website:

<http://www.sara.nysed.gov>

**How will you need to retrieve documents from the system?**

- Indexing is the key to effective use of an imaging system. Stand-alone systems generally provide both keyword and full-text retrieval capabilities. Full-text re-

trieval is accomplished through the use of Optical Character Recognition (OCR), which converts imaged words into alpha-numeric characters. OCR may also be used to extract certain words to create keyword indices.

You should carefully consider how you want to retrieve documents. Full-text searching may sound appealing, but full-text searches tend to locate many irrelevant documents. Keyword indices allow for document identification using a few pre-defined criteria. A combination of the two might be used. Indexing can be very labor-intensive and expensive, so indexing more than what is needed could become costly.

**Have you sufficiently considered the cost of converting paper documents to a digital imaging system?**

- Documents must be prepped before feeding them through the sheet feed scanners that are used for conversion. Preparation involves pulling staples, unfolding documents, and arranging documents in proper order. This process can be time-consuming, labor-intensive, and therefore expensive. Converting paper documents can cost ten cents or more per page.

**What is the document volume? What is the document accumulation rate?**

- You should calculate the number of documents that you want to convert to

the new system and the approximate rate of accumulation. This analysis will help ensure that the imaging system you implement will meet your document volume needs.

**What do you know about the vendor?**

- What are the vendor's previous experiences with state or local government agencies?
- Who are the vendor's customers? Will he or she give you customers' names and phone numbers?
- What are the vendor's plans for his or her products? Is he/she planning to continue support for his/her products?
- How financially viable is the vendor? Get copies of financial statements and have your finance officers look at them.

**Who to contact for more information**

In addition to these guidelines, SARA offers other services related to digital imaging, including educational events, other guidelines and publications, and advisory services. For more information about **these services, contact SARA at (518) 474-6926 or visit our home page at <http://www.sara.nysed.gov>**. You can also visit the home page of the New York State Office for Technology at <http://www.irm.state.ny.gov> to access policies related to electronic document management systems.

**APPENDIX A**  
**James G. Natoli - Director of State Operations**  
***Governor's Task Force on***  
***Information Resource Management***  
***Technology Policy 96-16A***

**Subject: Electronic Document Management Systems – Standards**

**Date: January 3, 1997**

**Purpose**

The purpose of these standards is to provide general guidance to agencies in the area of image enabled Electronic Document Management Systems (EDMS).

**Policy**

The attached standards represent the State's Preferred Standards for EDMS technology, and elaborates on the information provided in [Technology Policy 96-16](#) concerning Electronic Documents Management. The attached standards will be updated as needed, to reflect the changing technology marketplace.

The standards were arrived through review of industry's emerging directions and in consultation with system specialists employing this technology in State agencies and private industry.

<b>Component</b>	<b>Preferred Standard/Recommended Best Practice</b>
<b>Image File Format</b>	TIFF Version 6.0
<b>Compression</b> <ul style="list-style-type: none"> <li>• For Documents</li> <li>• For Pictures</li> <li>• For Video</li> <li>• For Fingerprint Images</li> <li>• For Audio</li> </ul>	<ul style="list-style-type: none"> <li>• Consultative Committee International Telephone and Telegraph (CCITT) Group 3 and 4 [CCITT is now known as International Telecommunication Union-Technical (ITU-T)]</li> <li>• Joint Photographics Expert Group (JPEG)</li> <li>• Moving Pictures Experts Group (MPEG) MPEG-1 and MPEG2</li> <li>• WSQ (FBI Standard)</li> <li>• Refer to <a href="#">Technology Policy 96-16</a></li> </ul>
<b>Architectural Recommendation</b>	Purchase or develop Open System Solutions
<b>The Network</b> <ul style="list-style-type: none"> <li>• Communications Protocol</li> </ul>	<ul style="list-style-type: none"> <li>• TCP/IP</li> </ul>
<b>Desk Top System/Client</b> The predominant desktop computers in use in the business/office environment are based on Intel architecture and run a Windows operating system. Modern desktop applications and operating	<ul style="list-style-type: none"> <li>• An evaluation of the market immediately prior to acquisition, as well as special needs should help to determine what to purchase. As of the close of 1996, a Pentium (class) Processor running at 133 MHZ with 32 MB of memory is the system of choice for the standard desktop environment.</li> </ul>

systems require more processing power (measured in MHZ) and more memory (measured in MB) to operate effectively. Inadequate memory results in a remarkable loss of performance and productivity.	<ul style="list-style-type: none"> <li>• Because of the potential for lower support costs, Thin Client architecture is being evaluated as a standard for use in installations where the applications are dedicated or predefined.</li> </ul>
<b>Desktop Operating System</b>	<ul style="list-style-type: none"> <li>• Windows 3.11, Windows 95, Windows N/T, OS/2 (Macintosh, and UNIX only for special requirements)</li> </ul>
<b>Video Monitors</b> <ul style="list-style-type: none"> <li>• Monitors used in imaging applications need to be large. Normally more than one window is on screen. Typically an 8 ½ by 11 document is displayed alongside a word processing or application window. Production image applications should display an 8 ½ by 11 document as full size.</li> </ul>	<ul style="list-style-type: none"> <li>• Large color screens, high quality</li> <li>• Minimum 17"</li> <li>• Monitors with extensive image viewing function should be a Minimum of 19"</li> <li>• Side by side document viewing may require 20" or 21" Monitors *NOTE: be aware that comparability problems may exist when used with Legacy applications</li> <li>• Minimum of 120 DPI resolution</li> <li>• Dot Pitch no greater than .28</li> <li>• Fast Refresh Rate of 70 Hz or better; at high resolution (1024) -768 or greater</li> <li>• Non Interlaced (NI)</li> </ul>
<b>Video Adapters</b> <ul style="list-style-type: none"> <li>• Video adapters accelerate the performance of a computer.</li> <li>• High resolution, large screen displays require adequate memory to buffer changing views.</li> </ul>	<p>To support EDMS display requirements:</p> <ul style="list-style-type: none"> <li>• Video adapters should utilize an accelerator chip set;</li> <li>• Video adapters should have a minimum of 2 MB of video memory. 4 MB to 8 MB are common for graphic applications;</li> <li>• Video adapters must be matched to the monitor (resolution supported, color palette, refresh rate) and the computer itself (bus, drivers, speed and operating system support);</li> <li>• For best product integration, video adapters should be configured and installed by the vendor that manufactures or assembles the system.</li> </ul>
<b>Scanners</b>	<ul style="list-style-type: none"> <li>• TWAIN</li> <li>• Image and Scanner Interface Specifications (ISIS)</li> </ul>
<b>Storage</b>	<ul style="list-style-type: none"> <li>• Stored on a server (or Mainframe acting as a Server)</li> <li>• WORM (Write Once, Read Many) technology should be used when data permanence is a primary consideration for retaining data.</li> <li>• If CD-ROM is used as a storage media, it must comply with ISO 9660 Standard which specifies how a CD-ROM disk stores information.</li> </ul>
<b>Legal Admissibility Standards</b>	<ul style="list-style-type: none"> <li>• Refer to Legal Acceptance of Electronically Stored Documents in <a href="#">Technology Policy 96-10</a></li> <li>• Guidelines for the Legal Acceptance of Public Records in</li> </ul>

	an Emerging Electronic Environment (State Archives and Records Administration)
<b>Data Base Software</b>	<ul style="list-style-type: none"> <li>• Open Data Base Connectivity (ODBC) Compliance</li> </ul>
<b>Standards Bodies and Reference</b>	<ul style="list-style-type: none"> <li>• American National Standards Institute (ANSI)</li> <li>• International Organization for Standardization (ISO)</li> <li>• International Telecommunications Union (ITU)</li> <li>• International Electrotechnical Commission (IEC)</li> <li>• ISO/IEC JTC</li> </ul>
<b>Reference Organizations</b>	<ul style="list-style-type: none"> <li>• Association of Information and Image Management (AIIM)</li> <li>• Document Management Alliance (DMA)</li> <li>• Institute for Electronic and Electronics Engineers (IEEE)</li> <li>• National Information Standards Organization (NISO)</li> <li>• National Institute of Standards and Technology (NIST)</li> </ul>
<b>Bar Code Standard</b>	<ul style="list-style-type: none"> <li>• refer to <a href="#">Technology Policy 96-16</a></li> </ul>
<b>OCR-ICR</b>	<ul style="list-style-type: none"> <li>• Application Specific</li> </ul>
<b>Multimedia Digital Motion Pictures</b>	<ul style="list-style-type: none"> <li>• AVI</li> <li>• MPEG</li> </ul>

## APPENDIX B



### Needs Assessment for Imaging Systems

1. What are the overall goals of your organization, department, or office?
2. What processes does your current records system support (e.g., accounts payable and receivable, legal research, case-file management, etc.)?
3. What are the deficiencies in the current system?
  - Unable to locate and retrieve documents
  - Several staff members often need a document at the same time
  - Electronic and paper records can't be linked
  - Document retrieval is too slow
  - Work backlogs adversely affect customers
  - High costs associated with current system (e.g. clerical support, misfiles, processing delays)
4. What record series are involved in the current process?
5. What are the retention and disposition periods for the records involved?
6. How do you separate active records from those eligible for disposal?
7. What is the volume and accumulation rate of paper documents?
8. Will all paper documents need to be converted to a new system?
9. What are the characteristics of your paper documents?
  - Size
  - Color
  - Weight
  - Physical condition
  - Single-sided/double-sided
  - Type of fonts
  - Print or handwritten
  - Photographs and/or drawings
10. Will microfilm need to be converted to the new system?
11. How are the documents currently arranged?
12. What access tools are currently in place?
13. How are the documents currently created and processed?
14. How are documents identified (e.g., case number, name, subject)?

15. Are any elements of your system automated?
  - What technologies are being used?
  - Are records created using computer applications such as word processing, spreadsheets, database etc.?
  - How are the electronic versions of records maintained?
  - How are paper and electronic records linked?
16. How are the documents used and accessed?
  - How many users will need access, and where are they located?
  - How often are the documents accessed?
  - Are there typical access patterns? Are there peak periods when documents are heavily used?
  - Will the documents need to be annotated at any time in the process?
17. What would you like a new system to do for you?
  - Lower misfile rates
  - Improve retrieval accuracy and speed
  - Increase availability of documents
  - Improve workflow
  - Improve security of documents
  - Improve processing
  - Provide greater longevity for your documents
  - Make more space available
18. What level of computer support is available?
  - Local area network
  - PC support (help desk)