

**NORTH CAROLINA DEPARTMENT OF CULTURAL RESOURCES  
OFFICE OF ARCHIVES AND HISTORY  
DIVISION OF HISTORICAL RESOURCES  
ARCHIVES AND RECORDS SECTION**



# **Guidelines for Digital Imaging Systems**

## **Phase I: Project Planning**

August 1, 2003

## ACKNOWLEDGMENT

The North Carolina Division of Historical Resources would like to acknowledge the assistance of the State Records Management Division of the Secretary of State's Office of Missouri. These guidelines are based on their publication *Guidelines: Digital Imaging Systems* <http://www.sos.state.mo.us/records/recmgmt/DIGuidelines.pdf> In addition, we consulted publications from other states such as Alabama, Connecticut, and Mississippi.

## PURPOSE:

We hope these guidelines will help you assess what imaging entails—the cost, the time, and the commitment. In addition, we hope they walk you through the process of determining whether or not the expense of imaging is in line with the cost and worth the commitment of resources and long-term planning.

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## **Introduction**

Organizations use digital imaging systems to create efficiencies and improve effectiveness. Imaging gives them the ability to capture, store, retrieve, and share an enormous amount of records over their networks. Provided proper metadata exists, users can typically find a document on an imaging system faster than they can find the paper or microfilm version. They can easily share documents using workflow software or e-mail. Organizations may even find a decreased need for filing cabinets and box storage space. Though this last point is predominantly emphasized, the true benefit of digital imaging comes from the first two – on-line access to documents and sharing of valuable information.

## **Is Imaging Right for the Project?**

The decision whether to implement an imaging system is complex. Many issues must be considered. What is the office workflow? Will imaging improve the workflow process? What is the desired outcome of imaging? How will imaging solve user problems? Will it meet real needs? How will it integrate into the existing computer environment? How will it improve office workflow and/or will it produce cost savings? Are there sufficient financial resources and management buy-in to support the system over time? The decision to implement an imaging system must be based on the business need and cost benefit analysis. The key to the successful design, integration, and implementation of a digital imaging system is proper upfront analysis.

The Government Records Branch of the North Carolina Division of Historical Resources created these guidelines to assist state and local agencies and officials with this analysis. They are intended to offer practical advice as you tackle the three major phases of system development: project planning; technology assessment and selection; and system implementation. Each phase is addressed in a separate section of the guidelines. By using the guidelines, you will gain a better understanding of the opportunities, challenges, scope, and scale of a digital imaging project.

# Phase I: Project Planning

An examination of the following issues and analyses is among the first steps to take when considering digital imaging as a solution for your organization.

## *Legal Issues*

The laws governing the creation and use of records will affect your decisions. Statutes and administrative regulations may define how records are created, the media on which they may be stored, and whether or not you can destroy them. North Carolina General Statutes Chapters 132, the Public Records Law, and 121, the Archives and History Act, provide guidance on what constitutes a public record and issues related to access and disposition of public records. The Public Records law (G.S. 132) states that:

132-1 (a) "Public record" or "public records" shall mean all documents, papers, letters, maps, books, photographs, films, sound recordings, magnetic or other tapes, electronic data-processing records, artifacts, or other documentary material, regardless of physical form or characteristics, made or received pursuant to law or ordinance in connection with the transaction of public business by any agency of North Carolina government or its subdivisions. Agency of North Carolina government or its subdivisions shall mean and include every public office, public officer or official (State or local, elected or appointed), institution, board, commission, bureau, council, department, authority or other unit of government of the State or of any county, unit, special district or other political subdivision of government.

132-1 (b) The public records and public information compiled by the agencies of North Carolina government or its subdivisions are the property of the people. Therefore, it is the policy of this State that the people may obtain copies of their public records and public information free or at minimal cost unless otherwise specifically provided by law. As used herein, 'minimal cost' shall mean the actual cost of reproducing the public record or public information.

The Archives and History Act (G.S. 121) states:

121-5 (a) State Archival Agency Designated. —The Department of Cultural Resources shall be the official archival agency of the State of

North Carolina with authority as provided throughout this Chapter and Chapter 132 of the General Statutes of North Carolina in relation to the public records of the State, counties, municipalities, and other subdivisions of government.

121-5 (b) Destruction of Records Regulated. — No person may destroy, sell, loan, or otherwise dispose of any public record without the consent of the Department of Cultural Resources, except as provided in G.S. 130A-99. Whoever unlawfully removes a public record from the office where it is usually kept, or alters, mutilates, or destroys it shall be guilty of a Class 3 misdemeanor and upon conviction only fined at the discretion of the court.

When the custodian of any official State records certifies to the Department of Cultural Resources that such records have no further use or value for official and administrative purposes and when the Department certifies that such records appear to have no further use or value for research or reference, then such records may be destroyed or otherwise disposed of by the agency having custody of them.

You must develop strategies to meet these and other legal requirements regarding your digital records, including compliance with an approved records retention and disposition schedule. The staff of the Government Records Branch will work with you to write a retention schedule to reflect the business needs of your office. We also strongly recommend consultation with your organization's legal counsel before implementing an imaging system.

In addition to the retention legal and fiscal issues, the IRMC of North Carolina, the Information Resource Management Council, states in its [Application Security Policy \(http://irmc.state.nc.us/documents/approvals/IRMCAppSecPolicy.pdf\)](http://irmc.state.nc.us/documents/approvals/IRMCAppSecPolicy.pdf) that all IT systems must have documented security specifications that include an analysis of security risks and recommended controls, including access control systems and contingency plans. Based on your office's conclusions, you should "provide the level of information protection for information assets that is appropriate to their vulnerability, risk level and organizational value" ([Information Asset Protection Policy](#) by the IRMC).

## ***Feasibility Study***

Before the decision to purchase an imaging system is made, a thorough feasibility study should be conducted. At a minimum, analysis should include:

1. **Needs assessment.** Conduct a needs assessment to determine what, if any, benefits you will gain by using an imaging system. An understanding of the total business process is critical to the project's success. A good starting point is to define and analyze the existing document workflow. In addition, consider other clients to whom the information is helpful and

- what role they might play in the document flow. Look for any problems and look for opportunities for improvements particularly in the areas of document storage, retrieval, and access. The knowledge gained in the needs assessment phase will prove invaluable in the system design and product selection phase.
2. **Customer satisfaction.** Consider how both your internal and external customers will or will not benefit from the new system. How much resistance to change is acceptable? How will satisfaction be measured?
  3. **Alternatives assessment.** One of the pitfalls of imaging or any other electronic technology aimed at the storage of records is rapid obsolescence of the software and hardware components of any electronic system. As will be discussed below, migration strategies *must* be a part of advanced planning for an imaging system. In addition, you should research alternative media. Microfilming should be among these alternatives. Microfilm and imaging each yield different, yet excellent benefits. For example, imaging is more cost effective than microfilm when retrieval rates are high. However, microfilm is ideal for the retention and preservation of the majority of long-term records. When comparing alternatives, be certain to consider on-going costs to determine the cost of access over time. You may decide that a combination approach — scan to microfilm — may be the best solution for your office. With this method you can either scan your documents and create microfilm from those images or you can create scanned images from microfilm.
  4. **Economic feasibility and cost-benefit analysis.** Determine whether expected cost savings, productivity improvements, and other benefits outweigh initial purchases and on-going expenses, (e.g. hardware, software, network, office space, and hiring new staff and/or retraining existing staff). In addition, determine if you want to do a backlog conversion of existing documents and the costs associated with such conversion. State agencies attempting a project with lifetime costs of \$500,000 or more must seek approval for the project from the IRMC. Details can be found at <http://irmc.state.nc.us>.
  5. **Technological feasibility analysis.** First, verify that reliable hardware, software, and storage media can be acquired or developed and will integrate with your existing systems. Second, verify that you will be able to migrate to newer technologies as necessary. In other words, the rapid rate of technological change must be considered and built into your plan. (More information on migration may be found in Phase II, page 14). The use of open systems and non-proprietary solutions will help to ensure the continued viability of the imaging system. Additionally, more information technology professionals and consultants will be able to perform work on the proposed imaging system if the system is an open architecture system. We strongly encourage you to involve your IT staff at the beginning of your planning as they can help you with internal information technology policies, standards, and technical architecture.

6. **Operational feasibility analysis.** Assess the willingness and the ability of management and staff to operate, use, and support an imaging system. Implementing a scanning system requires that you define a range of technical and procedural issues, including image specifications, staff training, quality control, and audit procedures. When software is upgraded, staff will have to be retrained to use it. Most importantly, once you have identified what records you want to scan, you should scan all of the records over time in a faithful, consistent manner.
7. **Recovery time assessment objective.** When deciding to purchase a system, analyze how long your office can stand to be “down” if the system is down. Assess how long your office can function without the images or data in the imaging system down before it negatively impacts your business.
8. **Recovery point objective.** Assess how much data you can stand to lose if the system does crash. Inevitably, if you are scanning and the system goes down, you will lose the information that you were scanning. Assess a level that is acceptable. Consult your information technology personnel to discuss these last two points.
9. **Exit strategies.** When discussing implementing an imaging solution, discuss and develop an exit strategy for different scenarios—the vendor goes out of business, the contract ends and is not renewed, or you switch vendors. Should your office decide to change vendors or simply cease scanning altogether, discuss the layout of the system with the vendor. Know what fields contain what information. Often, the name of a field is incongruous with the information contained in the field. In addition, make sure that you understand the links between tables and fields. Essentially, you want to ensure that you know what the file formats are, where they are stored, and how you get to them. Most importantly, when signing a contract, make sure that you and the vendor agree, in writing, to escrow the source code. If you have the code and the vendor goes out of business, you will be able to access and use the information. This is especially vital if the system is a proprietary system.

## ***Budget Issues***

The total cost of an imaging system includes not only the initial purchase of hardware, software, and technical support, but also on-going costs such as:

- **Storage media** – including optical disks, hard drives, network servers, etc.
- **Maintenance contracts** – this includes preventive maintenance, hardware repairs, software upgrades, and technical support, either in person or via telephone (typically this expense runs between 15% and 20% of the original purchase price per year).
- **Business continuity**—Recovery of damaged information, software, and hardware and continued operation with loss of facility, infrastructure, or staff.

- **Labor**--You must also consider the periodic costs and future considerations associated with ever-changing technology including the following:
  - **Refreshing media** – every three to five years depending on the media (more information on refreshing media may be found in Phase II, page 13).
  - **Technology upgrades** – as necessary. This could mean every five years or could be as soon as two. Technology changes rapidly and most will only support software that is two generations old.
  - **Replacement of obsolete hardware** – every three to five years is a good rule of thumb.
  - **Migration to new software and formats** – as necessary. If possible, work with a vendor who is knowledgeable about technology changes who will alert you when your records need migrating.
  - **System documentation** – reflects changes as a result of upgrades and migration. This is especially important regarding the legal admissibility of electronic records. You might consider contractually requiring the vendor to provide this information.
  - **Training** – new staff and retraining existing staff on new systems.

Remember market changes are inevitable. Those changes will require unforeseen costs. Newer technology drives out older technology. How many PCs in your office still have a 5-¼ inch floppy disk drive? The same fate will happen to one or more components of your imaging system. You must budget for change.

Before selecting a vendor, you should research the company's stability and reputation. You want to ensure that the company has provided others with excellent products and services. Talk with other customers. Also research the company's years in business. Stable companies who have been in business a while are more likely to stay in business than companies with little experience or companies that have not survived changing technological environments.

Unfortunately, system failure will occur. The system may be down for several hours or even several days. We recommend that you have a contingency plan in place that should address: How fast can the vendor be on-site for equipment repair? What can users do to get by while the system is down? What will support staff do while the system is down? How will you recover the system in the event of a disaster?

## ***Records Management Issues***

Many records management issues must be considered when planning an imaging system. For instance, every public record series has disposition

instructions stating how long records must be retained. Creating digital copies of records does not remove the original records from the records management schedule. Please consult the Government Records Branch web page <http://www.ah.dcr.state.nc.us/records/> to find your office's retention schedule or the *General Schedule for State Agency Records*. Please contact the Government Records Branch at [records@ncmail.net](mailto:records@ncmail.net) or call (919) 733-3540 to develop schedules for your digital copies and to discuss alterations to the schedules for your original records to account for the changes in your office procedures. A records management plan must be in place and followed scrupulously to ensure that information is kept and remains accessible as long as its retention schedule mandates.

Procedure manuals and other system documentation should become a part of your organization's approved records disposition schedule. Addressing these concerns at the design stage and putting in place the proper procedures from the beginning will ensure routinely managed retention and destruction of records on the system.

### ***Business Process Analysis***

One more process to analyze is the way your office handles documents currently and how they will handle them once the system is in place. Examine the workflow once a document is created or is received by your office. What does your office do with it, who sees it, and where is it filed? Are there any official signatures or approvals that a document must go through? Conversely, how will that same document be handled once your imaging system is in place? How does your office intend to bring that document in (e.g. U.S. mail, electronic mail or transfer) and what do you intend to do with it once it is scanned? What safeguards are in place to ensure that proper approvals have been received? If it is a file that is shared between departments, determine who will be the manager of the document.

Once that determination has been made, the departments should discuss who will do the imaging of the document, what resolution to scan at and what file type format the document should be. Will any of the images need to be redacted or have pages restricted from public view? If so, your office needs to determine who will be responsible for these actions. It may be that your IT department will create and manage the filters but they will need to have some sort of signal from you. If you intend to destroy the paper after imaging, what types of quality controls do you have in place, and how will that destruction be handled? Will the document remain filed for a period of time before destruction? Will you use a vendor to recycle or destroy documents? Assess these processes so that your system will succeed and you can effectively manage the documents once they come under your jurisdiction or are created in the office.

Please see Phase II: Technology Assessment and Selection to review the next step and help you determine what type of system— hardware and software— works best for you.