

Imaging systems offer institutions benefits in streamlining department and office workflow processes, reduced storage and retrieval costs, and improved customer service by automating customer files and correspondence. These systems present new concerns and challenges for examiners and the board of directors who must ensure that the risks are addressed by the institution's management (see Chapter 25 for additional information on FFIEC SP-10.)

## DEFINITION

Electronic imaging systems is a term that describes the technology used to capture, index, store, and retrieve electronic images of paper documents.

Imaging systems capture customer documents and store them in a digital form through the use of scanning devices. Additional data and text may be entered into the system as part of the customer record. The document is imaged, and the data and text are then indexed and stored for later retrieval at user workstations throughout the financial institution. Imaging systems can be designed to range from a small stand-alone system supporting work groups or departments, to large systems supporting multiple documents with hundreds of users. Images are stored on standalone optical disks, an optical jukebox, or magnetic disk. Peripherals such as scanners and laser printers are managed by LAN-based servers. Thus, the components of imaging are: capture data, store data, display data, print data, and transmit data.

## BACKGROUND

Technological advances in document scanning and optical character recognition are replacing the traditional paper storage systems in financial institutions. These systems incorporate new technologies such as optical disk storage, high resolution displays, document scanners, and laser printers to capture, store, and print documents. Once stored in electronic form, the documents can be accessed throughout the organization. Image systems can range from small systems supporting a business function or department with a few users, to large

systems or networks supporting multiple departments with hundreds of users.

Imaging systems replace the handling, distribution, and storage of paper documents with electronic images. They are generally grouped into two types of systems: document management systems and item processing systems.

## Document Management Systems

Document management imaging systems automate the flow of paper documents processed by departments and offices in a financial institution. These applications are referred to as low-speed imaging systems as documents contained in office or customer file folders are scanned one at a time. The process consists of capturing original documents in electronic form on a lowspeed scanning device, entering additional data and text into the record via keyboard entry, indexing the file folder and documents in a computer data base, and storing the folder on electronic storage media. Documents can then be displayed on a computer terminal, processed, or printed at work stations throughout the organization. These systems allow automatic routing of electronic documents to individuals involved in the review or decision making process. They also can route documents or file folders for quality control reviews.

Document management systems account for the majority of imaging systems in financial institutions today. Examples of business functions where original documents (loan applications, customer correspondence, etc.) are being converted to imaging systems to improve processing and customer service are:

- Customer service account inquiries.
- Student loan processing.
- Loan/mortgage servicing applications.
- IRA/Keogh files.

- Trust files.
- Signature verifications.
- Accounts payable.

### **Item Processing Systems**

Item processing imaging systems automate check or remittance processing applications on reader-sorters or similar high speed capture equipment. Images of transaction items are captured and stored for later use in encoding documents and exception processing. Item processing imaging systems require special attention to the quality and readability of the imaged documents. These high speed systems are relatively expensive to install as they require special scanning equipment, expanded storage capacity, and complex software programs to convert documents into readable electronic images.

Examples of item processing applications where transaction documents are converted to images for processing are:

- Proof-of-deposit.
- Sales draft (credit card/POS) processing.
- Remittance processing.
- Account reconciliation processing.
- Statement rendering.

### **CONTROL AND SECURITY RISK AREAS**

The replacement of paper documents with electronic images can have a significant impact on the way that an institution does business. Many of the traditional audit and security controls for paper based systems may be reduced or absent in electronic document workflow. New controls must be developed and designed into the automated process to ensure that information in image files cannot be altered, erased or lost.

Risk areas that management should address when installing imaging systems and that examiners should be aware of when examining an institution's controls over imaging systems include:

*Planning* – The lack of careful planning in selecting and converting paper systems to document imaging systems can result in excessive installation costs, the destruction of original documents, and the failure to achieve expected benefits. Critical issues such as converting existing paper storage files, integration of the imaging system into the organization workflow,

and equipment backup and recovery procedures should be addressed to avoid reduced customer service and business interruptions.

*Audit* – Imaging systems may change or eliminate the traditional controls, and checks and balances inherent in paper based systems. Audit procedures may have to be redesigned and new controls designed into the automated process. Audit departments should be sufficiently involved to ensure that electronic document workflows include appropriate audit controls and audit trails.

*Redesign of Workflow* – Institutions generally redesign or reengineer workflow processes to benefit from imaging technology. New jobs or functions are identified and others eliminated. Changes may range from the redesign of forms to the reorganization of departments. Traditional controls such as time/date stamps, control numbers, review signatures, etc. may be replaced by limiting access to imaged documents, automated logs that report document access, and retrieval information, etc. The absence of these, and other automated controls, may result in increased risks for the institution.

*Scanning Devices* – Scanning devices are the entry point for image documents and a significant risk area in imaging systems. Scanning operations can disrupt workflow if the scanning equipment is not adequate to handle the volume of documents or the equipment breaks down. The absence of controls over the scanning process can result in poor quality images, improper indexing, and incomplete or forged documents being entered into the system. Factors that should be considered in an imaging system are quality control over the scanning and indexing process, the scanning rate of the equipment, the storage of images, equipment backup, and the experience level of personnel scanning document. Procedures should be in place to ensure original documents are not destroyed before it has been determined a good image has been captured.

*Indexing* – Poorly designed imaging system indexes can result in lost or inaccessible documents. Proper indexing of scanned documents is critical to later retrieval, and establishing access levels to individual documents and file folders. The integrity of indexes must be carefully maintained to ensure access to all documents and protection from unauthorized modification. The indexing method can affect the security administrator's ability to restrict access to

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documents or file folders. The institution should maintain automated journals and audit trails of document access and modifications to customer records.

*Software Security* – Security controls over image system documents are critical to protect institution and customer information from unauthorized access and modifications. The integrity and reliability of the imaging system database is directly related to the quality of controls over access to the system. Software security and security administrator functions are essential to prevent unauthorized alterations to stored documents.

*Contingency Planning and Backup Procedures* – Since more than 100,000 documents may be stored on a single optical disk, the loss of electronic image files or storage media can severely impact business operations if back-up electronic or paper files are not readily available. Contingency planning and back-up storage procedures for imaging system documents should follow generally accepted practices for data processing and management information systems, including rotating duplicate optical disks off-site.

*Training* – Inadequate training of personnel scanning documents can result in poor quality document images and indexes, and the early destruction of original documents. The installation and use of imaging systems can be a major change for department personnel. They must be adequately trained to ensure quality control over the scanning and storage of imaged documents, as well as the use of the system to maximize the benefits of converting to imaging systems.

*Legal Issues* – Case law on the admissibility of electronic image as evidence has not yet been established by the courts. Although precedent has been established on related electronic documents such as facsimile, microfilm, and photocopies, the courts have not addressed the authenticity of electronic images of original documents. Institutions installing imaging systems should carefully evaluate the legal implications of converting original documents to image, and the subsequent destruction of the original documents.

## COMPONENTS OF THE SYSTEM

The components or parts of optical filing systems are:

- Document scanner.
- Personal computer(s) (e.g., 386, 486, Pentium system) capable of running the image software,

DOS-based software, and Windows.

- A high resolution, non-glare, large-landscape monitor that allows clear viewing of documents, while offering windows for viewing portions of other documents, creating documents, or running other applications.
- An optical-disk drive that may contain a three and a half, five and a quarter, 12" or 14" for storage. The disks may be write-once or rewritable.
- A "jukebox" that stores and retrieves imaged data.
- A laser printer that provides high-speed printing.
- Local area networks/wide area networks.
- Upgrades of mainframe computers are required for imaging, as well as image-capable check encoders and sorters, for a check processing environment.
- Application software used for text retrievals and searches, and image management.

## BENEFITS

Most areas of the institution could benefit from the use of imaging systems. Examples of potential uses are: check/item processing signature verification mortgage loan servicing loan origination and trust file and pension fund management. Some benefits derived from an optical system are:

- Increases productivity.
- Improves service (fewer lost documents).
- Improves the business process/electronic work flow.
- Reduce business costs (e.g., reduced floor space, file cabinets, and labor) since 100 cases of paper are stored on one 5 1/4" optical disk. This would be equal to 750,000 customer statements. A bank can mail two checking account statement pages and two imaged pages (36 checks) to a customer, which weighs one ounce. In a conventional environment, the statement and checks would weigh two ounces.
- Positions for the future.
- Improves control over paper files and reduced

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deterioration due to handling.

- Gives access to data by multiple locations.
- Allows simultaneous usage of the same material.
- Increase potential market share.
- Provides opportunity to learn hands-on.
- Reduces fraud, especially credit card fraud. Customers' pictures are stored and their images are transmitted to credit card merchants for purchase verification.
- Enhances employee skill sets.
- Yields higher profits.

### **RISKS**

- Legal issues.
- Longevity of optical disks is unknown (i.e., shelf life claims range from 10 to 100 years).
- Major impact on the way a financial institution operates.
- Developing standards.
- Very costly (including conversion process).
- Maturity of vendor/product.
- Problems with character-recognition process (i.e., for check processing, some software is correctly reading check dollar amounts only about 50 percent of the time). This is due to the quality of the checks.
- Loss of data.
- Images indexed incorrectly.
- Incomplete document set.
- Access to paper documents.
- Fraud – deliberately altering, destroying, or counterfeiting images.
- Hiring and keeping an adequate number of skilled personnel who are knowledgeable about imaging.

### ***Examples of Imaging Testing or Use***

The following are examples of how imaging is being used or tested:

- To decipher handwritten dollar amounts on checks.
- To reduce the back-office proof of deposit function.
- To transmit images of checks in return-item notification, and canceled checks that are held or truncated, at the point of deposit.
- At a credit card customer service center, incoming mail is now scanned as soon as correspondence is opened. This permits customer service to know when letters arrive, the actions taken, and when. In addition, customers' account histories are available on-line. As a result, telephone service levels have improved, and the average speed of answer was reduced from 2 minutes to 12 seconds.
- A desktop imaging pilot for 8,000 Lotus Notes users will store, retrieve, print, and fax documents. Imaging is used in new construction projects. Source documents such as invoices, canceled checks, technical specs, building permits, contracts, and purchase orders will all be imaged. Hence, facilities management is becoming image-enabled. All images are linked to the bank accounting system.
- A mortgage processing center is actively using imaging for all mortgage-related documents; IRA/CD were imaged as well as all documents in the retail loan area were imaged.

### **IMPLEMENTATION**

Banks and other corporations are focusing on applications to scan that are manageable, visible, and valuable, so that success will attract the support of top management. As imaging becomes integrated into the mission critical processes of a financial institution, integrity must be maintained, and the adequacy of controls should be ascertained. Image-processing systems are configured similarly to other information services environments with the exception that a new data type (digital image file) has been introduced, and that new capture peripherals (scanners) and storage media (optical disk) are involved.