Electronic Document Management as a Component of the Electronic Health Record

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Practice Brief

Since the early 1980s, the healthcare industry has been discussing the need for electronic health records. And indeed, the past 20 years have seen the industry move toward a completely computerized medical record. A variety of technologies have contributed to this evolutionary process, including point-of-care clinical documentation, clinical data repositories, and automated results. The cumulative effect has resulted in slow but steady progress toward a complete electronic health record for the healthcare industry.

Despite the industry's progress, most healthcare organizations (HCOs) continue to be plagued by paper-based health information. Most HCOs are using a hybrid medical record: partially computer-generated and partially paper-based. Only a few HCOs have reached a completely electronic record. Wherever organizations lie on the EHR evolutionary timeline, they are learning that the technologies of electronic document management are a necessity. The goal of an electronic document management system (EDMS) is not only to eliminate paper, but also to manage *all* the organization's documents-- computer-generated and paper-based.

Many HCOs are discovering that an EDMS is a key component of the electronic health record. This practice brief is a compilation of best practices detailing the key steps or issues in implementing an electronic document management system. A number of the steps and guidance focus on document imaging technology because of the impact it has on the HIM department today. It is important to remember that document imaging is one type of technology used in an EDMS.

Step 1: Determining your information technology strategy

Step 2: Understanding the technology options, issues, and functionality

Step 3: The planning phase

Step 4: The implementation phase

Step 5: The postimplementation phase

This practice brief uses many technical terms. To help bring clarity, a glossary is provided. Some of the terms defined in this document have industry standard meanings and can be found on the TechEncyclopedia Web site available at www.techweb.com/encyclopedia/.

Step 1: Determining Your Information Technology Strategy

AHIMA recommends that health information management (HIM) computer systems complement the clinical health information systems (HIS) that are acquired and installed in US healthcare organizations (HCOs). Clinical HIS systems will benefit from the increased mainstreaming of HIM computer systems and vice versa. For example, more HIM departments will become more automated as enterprise HCO information technology (IT) strategies are expanded to include HIM systems.

In the past, HIM computer systems have not been included in enterprise IT strategies. Typically, this has hindered the movement away from managing paper-based systems, pigeonholed HIM with disparate, departmental computer systems, and resulted in a severe lack of automation in HIM departments.

With the recent industrywide focus on installing enterprise-wide EHR systems and the goals of HCOs becoming 100 percent digitized, HIM computer systems must be included in the enterprise IT strategies that guide EHR design, planning, procurement, and implementation. Therefore, HIM professionals must illustrate the benefits and requirements for inclusion of HIM computer systems in enterprise IT strategic planning initiatives.

HIM Computer Systems

Currently, HIM departments perform several processes that require IT solutions. Chart completion and e-signature management, chart deficiency management, paper chart tracking, enterprise patient identification, release of information, dictation and transcription, and coding and abstracting are examples of these processes, all of which have benefited from computerization. Document management also is an example of an HIM process that requires an IT solution. As such, an EDMS, with its many component technologies such as document imaging, work flow, and records management, is another HIM computer system that provides significant benefit to the HIM process. (See Appendix A, "HIM Computer Applications.")

To date, most HIM computer systems in HCOs have been characterized as *departmental* or smaller, less-than- enterprise-wide systems. Some are embedded in HIS products provided by major vendors. Rarely have these systems been considered strategic to the HCO.

This is beginning to change as HIM computer systems, including EDMSs, are being recognized as fostering enterprise-wide process and patient safety improvement initiatives. For example, well-organized, longitudinal, and digital medical record information, available anywhere, at any time, on any device, contributes to improved patient safety and quality of care.

Clinical HIS Systems

Clinical health information systems are used by care providers to document the care provided to patients (e. g., computerized physician order entry [CPOE] systems and clinical documentation systems). For HIM professionals, clinical HIS systems typically automate the familiar chart components, such as physician progress notes, nurses' notes, graphics, and ancillary notes.

In the past, clinical HIS systems were created by clinicians for clinicians, with little thought to their impact on HIM and other HCO processes that work in the background to support caregivers, such as creating and maintaining the legal record and collecting revenue. Today, newer generation systems are being created to include these supporting process requirements. For example, many of these systems include the document imaging technology component of an EDMS, because supporting the process requirement of scanning paper-based documents remains useful until all physician, nursing, and ancillary documentation is captured in a digital format at every HCO.

In addition, many clinical HIS systems require physician, nursing, and ancillary staff acceptance. Having complete records available (i. e., complementing clinical HIS systems with EDMS technologies) with scanned documents and other forms of digital documentation at the clinical desktop is beneficial for this acceptance. Eliminating trips to the HIM department to complete paper-based documents is also an attractive means for achieving clinician acceptance.

EDMSs: A Strategic Technology for the HCO

Despite significant investments in and benefits from a wide range of implemented clinical HIS systems, most patient-centric process areas within the HCO, in whole or in part, continue to realize the need for EDMSs. EDMSs enable many areas of the HCO to more effectively and efficiently use and process paper and computer- generated content, represented by analog or digital documents such as forms, notes, letters, reports, and messages. EDMSs allow these areas to migrate from their existing analog and manual output and processes to digital output and processes. And EDMSs complement their already automated (or perhaps less than automated) data technology solutions. As such, EDMSs become critical for HCOs to continue to realize efficiency and quality improvements in work processes.

The most important reason for acquiring and implementing an EDMS is *not* to eliminate paper. The most important reason for acquiring and implementing an EDMS is to manage the organization's *documents.* Documents--analog or digital--are organizational assets. Like the organization's data/information and money assets, HCOs must respect the necessity and strategic importance of managing its document assets. Further, organizations must manage the documents well or risk not only increased liability but information loss, which significantly affects patient safety and quality of care.

Even though document imaging technology--only one component technology of an EDMS--is the primary component technology for HIM departments, other component technologies, such as COLD/electronic record management (ERM) and work flow, must be included in clinical IT strategies. This is because most of the EDMS component technologies, not just document imaging, are needed to meet HCOs' many short and long-term electronic document requirements. In addition, frequently EDMS benefits are realized only when some EDMS component technologies are used in tandem.

For example, for HCO areas that currently process massive amounts of analog documents, such as HIM, an EDMS' document imaging and character recognition technologies remain critical until *all* internal and external (i. e., documents from the outside) healthcare forms, notes, letters, reports, and messages are generated, stored, and distributed electronically (i. e., digitally). However, for areas that currently process fewer analog documents, other EDMS component technologies, such as document management and work flow, are emphasized.

Most existing and future clinical HIS systems, such as laboratory information systems (LIS) and PACS, as well as financial and administrative HIS systems, such as patient billing/accounts receivable systems and credentialing systems, require EDMS component technologies. For example:

- Today, these information systems must have the ability to automatically fax out analog or digital documents in the event only a fax machine is at the receiving end. Similarly, these systems must have the ability to automatically capture and index faxed-in documents (document imaging technology).
- These systems must have the ability to automatically consolidate the storage, access, management, and distribution of digital source documents (ERM technology).
- These systems must have the ability to electronically assign, route, and activate the organization's business operations and decision processes through system-controlled rules (work flow technology).
- These systems must be able to electronically assemble a group of documents, control the versions and secure the documents, such as medical administration records (document management technology).
- These systems must be able to validate the authenticity of any individual transmitting information electronically and ensure the security of the information (digital signature management technology).
- These systems must be able to electronically create, deliver, and customize document content across the enterprise (document content management technology).
- All the documents generated by these systems must be electronically filed by type, legal use, and date to obey important file retention/destruction requirements. This avoids any physical handling and permits quick implementation of HIPAA-based file retention policies and procedures (records management technology).

HIM, EDMS, and Clinical HIS Systems as an IT Strategy for the Future

When the day arrives that HCO clinical, financial, and administrative information systems are enhanced, acquired, and implemented in *all* HCOs so that the organizations can input, output, send, and receive all-digital data or information, the healthcare industry will have achieved an all-digital infrastructure. As such, all these fully digital systems will eventually replace the organizations' current paper-based technologies and systems for the management of its medical, financial, and administrative documents. The promise for these all-digital systems is to drastically lower, if not eliminate, information recorded on paper. Therefore, when that day arrives, an EDMS document imaging technology component will be less important. However, all the other technology components of an EDMS will continue to be needed.

Important HIM, EDMS, and Clinical HIS Systems Strategy Considerations

HCO-wide strategic IT planning for clinical HIS systems must include HIM computer systems such as EDMSs. Therefore, HIM professionals working in HCOs must be included in the strategic IT planning processes to ensure that HIM requirements are met. To be included, HIM professionals must ask the following questions:

- What are the long-term goals for the following HIM processes?
    - Chart retrieval and viewing
    - Document capture
    - Chart completion
    - Release of information
    - Coding and abstracting
    - Deficiency management
    - Transcription
    - MPI maintenance
    - HIPAA, Joint Commission, and CMS compliance
- How do these HIM processes relate to clinical HIS systems? For example, if verbal order signatures are not tracked by HIM, what impact will this have on CPOE systems?
- Will HIM computer systems, such as EDMSs, be installed as departmental systems separate from the clinical HIS systems? If so, how will important interoperation with the clinical HIS systems occur? Through interfaces or through integration, with the primary clinical HIS system vendor providing HIM functionality as a part of the clinical HIS systems?
- What HIM requirements are included in the HCOs' clinical HIS system RFPs and procurement processes?
- What plans are instituted to guarantee physician and other clinician acceptance of the HIM computer systems? For example, with EDMSs this might include requiring robust EDMS functionality to allow for online medical record access and chart completion.

Step 2: Understanding the Technology Options, Issues, and Functionality

In the past an electronic document management system (EDMS) was synonymous with managing documents after they were scanned into the computer. Today, EDMS encompasses a variety of technologies--paper documents that are scanned to create a digital image, work flow technologies, multimedia technologies/formats, and computer generated content (moving digital documents such as an H& P or discharge summary automatically from a transcription system to the EDMS without creating paper). Online IT encyclopedia Tech-Web notes, "There is a trend toward designing information systems that are document centric, where the document becomes the focus, not the application that created it, is expected to bring document management to the forefront of computing."

There are many technical components to an EDMS and a wide variety of implementation options. To completely evaluate all the components and options can be a daunting task. This section will explain the various technology and implementation options offered by EDMS vendors and define the key components of an EDMS.

More than just scanning, an EDMS consists of six key functions: automated forms processing; electronic signature, document annotation and edit; document capture; document indexing, bar coding, character and form recognition and forms redesign; document retrieval, viewing and distribution; and document management. All of these functions work together to create a complete EDMS.

Automated Forms Processing Technology

Automated forms processing technology is one component technology of an EDMS. This technology allows the user to electronically enter data into online, digital forms and electronically extract the data from the online, digital forms for various data collection or manipulation purposes. In other words, the technology replaces analog fill-in-the-blank forms that must always be digitally scanned. Typically, online digital form documents are stored in a form format--as the user sees it on the screen--for ease of reading and interpretation.

Electronic Signature, Document Annotation, and Edit

The ability to electronically sign, add notes, and edit documents is a key EDMS component included in work flow technology. Electronic signature capability should be included for both scanned documents and text documents. Work flow rules direct unsigned documents (scanned notes and dictated reports) to a physician's work queue. Documents can then be signed and edited or an addendum added. Updating documents and securing signatures electronically automates the record completion process with little human intervention.

Document Capture

Document capture may be performed using a variety of technologies, including scanners, electronic forms, electronic transactions, cameras, voice, and video. Within an EDMS, document capture will consist of most of these technologies, however, the ones most commonly used are scanning, and electronic transactions. Electronic transactions include faxes, those documents received via COLD (computer output to laserdisc), as well as those received through ANSI transactions. Some documents are captured using a combination of COLD and ANSI--the electronic transaction comes into the EDMS via ANSI, and populates a COLD template to create a document image. When evaluating the document capture method to use, it is more effective to capture electronic transactions first (ANSI as COLD) and use scanning as the last method of capture electronic transactions are more accurate and less labor intensive than scanning.

Document Indexing, Bar Coding, Character and Form Recognition, Forms Redesign

Bar coded separator sheets: Many times forms redesign takes many months to complete. However, scanning operations may need to begin before this process is completed. Many systems allow the use of bar coded separator sheets for each section of the record as a precursor to complete forms redesign. Inserted into a chart during assembly, the separator sheet contains the bar code for the next group of documents (i. e. nurses' notes, orders, etc.). In this way, bar coded document indexing is performed with somewhat more preparation time than bar coded forms, but with higher accuracy and speeds than can be accomplished manually indexing each form.

Forms redesign: One of the goals of forms redesign is to identify and describe the form characteristics required to ensure successful form identification when using an EDMS. Complying with bar code design specifications will ensure the highest level of accuracy when using a bar code engine for bar code recognition. It also helps to identify form characteristics required to ensure better accuracy using forms recognition features of an OCR/ICR engine.

These form characteristics recommended in Appendix B, "Specific Forms Characteristics," should be incorporated within each document during the HCO's forms redesign process. Compliance to these standards will ensure a successful implementation of an EDMS solution.

Bar code: Code 3 of 9: Most EDMSs support Code 3 of 9 (also referred to as Code 39) bar code standard. This is an alphanumeric, self-checking, variable-length code that employs five black bars and four white bars to define a character. Furthermore, three of these bars are wide and six of these bars are narrow. The wide bars and/or spaces are at least two, but preferably three, times the width of the narrow bars and/or spaces. When implementing document imaging technology using bar codes, it is important to understand the bar code specifications, the bar code content, and issues related to bar code placement on the form. Appendix C, "Bar Code Information and Guidelines," provides additional information and guidelines on bar coding.

Document Retrieval, Viewing, and Distribution

Retrieving documents will depend on how an EDMS is deployed. In some cases it could be through the organization's intranet, the Internet, an application on the desktop, or within the clinical system. Ideally, access is simple and doesn't require the user to

jump back and forth between systems.

Viewing of documents should be provided on site in designated work areas or throughout the organization. Remote viewing should be provided to authorized users in particular to support remote viewing of documents from physicians' offices, remote completion of records, and remote coding.

Basic and advanced search methods should include filters and the appropriate security measures to track access and to limit access on a need-to-know basis.

Distribution should be defined by the organization and includes the following options

- Online viewing only for authorized users
- Online viewing and printing (generally only provided to HIM staff to support release of information functions)
- Auto fax for authorized users

Document Management

When HCOs arrive at a completely electronic health record, document management technology will still be required to manage every type of document, ensure correct content, and support linkages between various computerized systems to reproduce a complete, legal medical record. Within the document management function of an EDMS, there are six key attributes: document management technology, document content management, enterprise report management (COLD), records management, work flow, and Web content management.

Document management technology is another component technology of an EDMS. This component technology just happens to be given the same name as the system. Every type of document (analog or digital) and every section or part of a document requires "external classification" for appropriate retrieval. In other words, the document must be indexed with key words chosen to describe the document. Because of this, this technology additionally includes very important and related functions, such as electronic document version control, electronic document check-in/check-out control, and, most importantly, electronic document access control (e. g., an audit of every person who retrieved the document).

Document content management technology is another component technology of an EDMS. This technology goes further than document management technology because it takes into account the "internal classification" of a document and the metadata associated with the document. As such, the technology electronically manages the creation of the document (i. e., authorship, such as the LIS for a laboratory result report), distribution of the document (i. e., publication, such as the HIS for the laboratory result report), and customization of the entire, section, or part of the document. Another example of document content management technology is the creation/ authorship, distribution/publication and customization of the document content in a multipage spreadsheet or graph (e. g., a flow sheet).

Enterprise report management (ERM) or COLD (computer output to laser disc) or COLD/ERM refers to the technologies and formatting behind bringing electronic files into a document management system. For example, automatically moving a dictated and transcribed H& P for a patient from the transcription system to his or her record in the EDMS without printing or handling paper. To gain efficiencies in an EDMS it is important to manage documents that are created electronically and will remain electronic--such as ADT information, lab reports, transcription reports, bills, remittance advices, etc.

The key technologies or standards behind enterprise report management are

- COLD
- HL7 messaging standards
- Interface engine
- Report format
- Metadata attached to report
- XML

Records management (storage and retention): As a general rule, paper records should be boxed up after all paper is scanned, indexed, and released in the EDMS, stored for no longer than six months, and then destroyed. An organization may influence skeptics of destroying the paper by demonstrating quality processes on the front end--during scanning and indexing.

The EDMS totally transitions a facility in terms of the legal medical record, and the legal definition is no longer based upon paper.

HIM work flow: Work flow is a critical component of an EDMS because it enables electronic routing and concurrent processing. In addition, many tasks traditionally performed within the HIM department can now be performed from secure home offices or other locations within the healthcare facility. Work flow rules identify the tasks, how they are routed, any condition between the tasks as well as the sequences and dependencies between tasks.

In a record completion work flow rule, for example, as the status of dictation changes from dictate to transcribe to sign to signed, the status of the deficiency system is automatically updated without human intervention. At the same time, a request for dictation or review and signature is routed to the physician's in box.

Coding is another critical HIM work flow in that it enables records to be distributed to coders' work queues. Coders code using the electronic record instead of the paper record. They should be able to route records to supervisors for coding questions, to physicians for coding query, or to auditors for prebill review, for example. Coding from the imaged record or clinical system creates new opportunities to meet bill hold requirements, manage space, and recruit coders.

Details regarding HIM work flow are discussed in detail in "Work Flow Redesign", below.

Web content management technology is another component technology of an EDMS. This technology is similar to document content management technology. Where electronic health record documents are being posted and shared on a HCO's private Web site/intranet for internal, private communication and retrieval purposes, this unique technology must be managed appropriately. A document such as a graphic flow sheet must be linked into hundreds of different Web pages with parent pages having different owners/creators, business rules, and formatting requirements.

Document Imaging Implementation Options: Stand-alone Versus Integration

Document imaging is one type of technology that can be used in an EDMS. It can be implemented as a stand-alone departmental solution or one that integrates with existing clinical applications. Often stand-alone solutions are installed in one to two departments such as HIM or billing, solving problems inherent in the access, movement, and storage of paper documents.

Stand-alone document imaging systems require implementers to consider how document imaging will interact with clinical systems. These systems often stand on their own, with little connection with other systems except to receive data through interfaces. If an HIM department chooses to go this route, access to authorized users outside of HIM should be provided in a manner that does not require users to leave the clinical system to view information in the document imaging system.

Several clinical vendors now include document imaging as a component of their clinical health information systems (HIS) achieving greater integration with clinical applications than its stand-alone counterparts. It is becoming more common for clinical vendors to include the breadth of required HIM functionality, which includes document imaging as a critical component.

The implementation decision to purchase a document imaging component as a stand-alone system or to purchase it as part of a clinical HIS system will be based on where an organization is on the path to the electronic health record. It will also be based on the functionality provided by clinical vendors versus stand-alone document imaging vendors.

Scanning Options

If document imaging is used as a component of an EDMS, HCOs must decide whether to centralize or decentralize their scanning operations.

Centralized scanning operations: Centralized scanning requires that all documents within an organization be sent to a central location for document capture through scanning. Depending upon the size of the organization, documents may be delivered internally to the scanning location or they may be delivered via courier multiple times throughout the day.

Decentralized scanning operations: As the EDMS is deployed throughout an organization, decentralized scanning is another choice for document capture. Scanning workstations can be placed in clinics, registration areas, or other off-site locations. As paper documents are completed, they can be scanned and indexed immediately or placed in a queue for indexing later. Decentralized scanning allows more of the documents to be captured prior to a patient being discharged rather than the

scanning being done within HIM after discharge. Registration information such as insurance cards and advance directives can be available immediately for benefit verification and patient care.

Record Management Options

Mass storage has changed over the years from being optical disk based to the latest direct attached magnetic and storage area networks. In the past the term *optical disk imaging* was used with emphasis on *optical disk* because this was the only storage device able to deliver price, performance, and volume of storage necessary to manage a document imaging system for high-volume medical record applications.

Write once read many (WORM) optical disks also were archival in nature and tended to calm the fears of a market that was unused to imaging, storage, and electronic applications in general. However, use of WORM technology required proprietary file structures, migrating and caching routines, and other assorted barriers to achieving full market penetration.

Although optical disk technology is not required for legal or technical reasons, they still may be sold and used in the marketplace for quite a long period of time. Many existing vendors, HIM departments, and HCOs have invested in this technology and improvements continue to be made to optical disks and jukeboxes. The following are a few concepts that anyone investigating optical disk based imaging or document imaging should become familiar with:

- **Platters:** WORM or rewritable (erasable) optical disks
- **Jukeboxes:** Robotic devices that manage many optical platters. Used to be 12" and 5.25" formats, today only 5.25" is common
- **Redundant array of inexpensive disks:** Multiple magnetic hard drives linked together to ensure data redundancy
- **Network connectivity:** Storage devices accessible from any point on a network
- **File system:** The actual logical file allocation and storage structure, how a database stores its information for retrieval. Typically optical disks required a specialized, proprietary file system to manage the optical platters and jukeboxes along with magnetic storage
- **Hierarchical storage management:** The management of information through the use of multiple devices that handle the information at different points in its life cycle. An example might be to place the documents on magnetic, move them to optical, and later archive the optical to tape
- **Back-up and redundancy:** The mechanisms, both hardware and software, that keep copies of documents and system information to ensure data recovery upon catastrophic system failure and/or data loss
- **Direct attached storage:** Magnetic storage that attaches directly to a server, not necessarily through a network
- **Application service provider (ASP)** based storage: Managing documents and information via Web access on servers and storage devices located remotely

Retention Rules

The records retention requirement--the period of time the documents must be stored and maintained accessible-- is a critical element in planning an EDMS. The length of that retention period will determine in part the access, maintenance, and migration activities that must be factored as part of the imaging system's ongoing costs. Those costs will continue to accrue for as long as the documents must be retained.

All healthcare records, including those stored in imaging systems, should be maintained and disposed of as part of a legally accepted records management program in order to ensure their acceptance as legal documents. States are required by law to have a state records committee- approved records retention schedule (records life cycle plan) for each record created, maintained, and received. All health records to be put on an imaging system must have retention schedules in accordance with state retention laws.

Many (if not most) HCOs considering the application of imaging technology will already have approved records retention schedules for their records. Most of these schedules, however, will have been approved for paper-based records. The aggregation of documents to be stored in an imaging system likely will not correspond to the file groups (records series) on which the existing retention schedule was based.

Obsolescence is a way of life in the information technology world. HCOs need to keep pace with constant change and improvement. This requires a proactive approach to system maintenance and upgrade. New applications should be backward-

compatible with existing applications. Managers should plan to budget between 5 and 10 percent of the original system annually for the cost of upgrading and data migration.

Financing Options

Lease: A form of financing in which the lease company actually owns the hardware, software, or system and the lessee uses it for a defined period of time. This can lower the cost in the short term. Whether a HCO leases hardware, software, or systems depends on the philosophy of executive management and the organization's financial models.

Buy: The typical acquisition of hardware, software, or services for a determined price. Once software is purchased, it is owned by the HCO; however, maintenance fees will be charged to keep the software up to date so the cost does not end with that purchase.

Subscription: A new form of financing in which software license fees, upgrade versions, and support, or any combination thereof are divided up over a period of time (three, five, or seven years, typically) with the HCO paying on a monthly or yearly basis. The HCO does not actually own the software but rather subscribes to its use. Subscription pricing can extend beyond software in some cases to cover services.

ASP: An ASP provides a service or application from a remote site. For example, a HCO might scan records on site and via telecommunications (including the Internet) store and then access the documents from a server located remotely from the HCO. The images may reside across the nation or across the world. The ASP financing model tends to concentrate on pay-as-you-go models where fees are paid for each qualifying transaction. Others are modeled after a subscription service. With ASPs, the software is hosted by the vendor and accessed by the HCO.

Step 3: The Planning Phase

Once you understand the key components of an EDMS and how each will function within your HCO, you are ready to make a presentation to your senior management, perform an EDMS cost justification, select a vendor, plan for staff transitions, identify work flow changes, and establish an implementation timeline. Your first juncture is to clearly articulate how the EDMS will benefit your entire HCO. A mission statement positioning the EDMS as an enterprise-wide solution and a key component of your HCO's overall IT strategy is a valuable tool in solidifying senior management buy-in throughout the entire process.

Justification and Return on Investment Like any other investment, an EDMS must demonstrate tangible and intangible benefits to the HCO. A key benefit will be access to information. In fact, simultaneous, multiple user access is cited as the number 1 reason HCOs are migrating toward electronic health records. Beyond access, benefits of an EDMS must be measured in hard-dollar and soft-dollar savings. These benefits should be documented, a return on investment calculated, and presentation made to senior management.

Built into your case is an assumption that the information contained in a medical record is inherently valuable and that value is attributed to the amount of uses this information has. The uses can be identified in a quantitative and qualitative manner, and their impact can be understood as yielding benefits, which can be described as tangible or intangible. The same logic applies when evaluating the benefits of including nonmedical record documents in the EDMS within a healthcare setting.

One of the most important changes that will occur in the move from the manual world to an electronic environment is the ability to provide access and enable simultaneous access among multiple users.

With this understood, a variety of operations that would potentially benefit from an EDMS need to be assessed in order to determine that there will be a significant return on investment (ROI) in order to justify acquiring a system.

What Needs to Be Justified and Why

Once an organization begins to consider whether or not to adopt an EDMS, the decision will largely depend on the cost. Healthcare facilities work under tight budgetary constraints. To sell a system to management, present it realistically as an ongoing investment. The costs begin once a decision is made to purchase a system and continues through all phases of the project, including ongoing maintenance.

Understanding and quantifying current chart management activities is essential to know what their actual costs are. Appendix D, "Helpful Justification and ROI Statistics," provides suggested statistics that may be useful in providing a benchmark toward what you wish to achieve.

The ROI documentation has to be presented with a global objective that should tie in with an organization's mission, vision, and long-and short-range strategies.

It can be useful to supply drilled-down statistics for key areas that will benefit from an EDMS, such as coding, release of information, chart completion/electronic signature, and finance to use them as examples to highlight this process.

One other strategy, which can exemplify the justification and ROI process for an organization, is to bring in the experience of similar facilities that have already implemented an EDMS.

Tangible and Intangible Benefits Appendix E, "Justification for an EDMS: Tangible and Intangible Benefits ," provides a detailed grid that breaks down key activities that will be impacted by an EDMS. The benefits are broken out in ways that can be understood as tangible and intangible.

These benefits are not mutually exclusive and may both impact the ROI. The tangible is predictable and easier to measure in cost benefits to an organization. The intangible may only be fully realized and quantified when a system is actually in place.

Planning Steps/Checklist Once you have determined your facility is planning to move forward with the implementation of an EDMS, the detailed planning steps must begin. To ensure a full return on investment, it is important to complete each step with adequate time for planning.

In addition, remember to include the appropriate stakeholders (users, influencers, key decision makers, etc.) into your planning. Some of these key players may already be on your electronic health records task force. You may call others into a decision-making component of planning only as needed.

While all of the planning activities should be initiated as soon as a decision is made to move forward with implementation, a sample checklist is provided with examples of timing and the appropriately involved personnel. Note that the entire planning checklist may take 6 to 18 months to complete.

There are 11 key steps in the planning process:

1. **Assembly:** Ensure the record is in the optimal physical order for efficient processing for records to be scanned.
2. **Types of records:** Determine where each of the following is stored and how reconciliation will occur on a daily basis (check in and account for each chart, even outpatients).
3. **Forms inventory/format:** Create inventory with sample of each form.
4. **Loose/late reports:** Determine policy on receipt of loose reports, adding in order or filing in back of chart, and codifying once entered into system.
5. **Physical layout of equipment:** Determine work flow in HIM department.
6. **Analysis, deficiency, and electronic signature process:** Ensure that the medical record is complete and that entries are timely according to established rules and regulations.
7. **Paper storage/filing:** Determine disposition of paper documents after scanning.
8. **Communications:** Ensure that all stakeholders receive critical information about the new system and the impact.
9. **Quality assurance:** After documents are scanned, the next steps are indexing and quality control. Indexing is performed to assign document names and encounter numbers to each document. Quality control is performed on 100 percent of images to review the quality of scanned images. In addition to this initial quality control, ongoing quality monitoring should be performed on a random basis.
10. **Policy and procedures:** Develop new policy and procedures.
11. **Legal considerations:** The information stored is the entity's business record (in healthcare, the legal record). A plan to house this information on media other than paper must be scrutinized by legal counsel to ensure that the technology being considered can comply with federal and state laws, requirements for licensure, and credentialing along with operational needs and that it is consistent with existing policies and procedures. There should also be a risk management component to ensure that there will be no compromise to patient care and that documents required for lawsuits remain available.

This latter consideration may impact a facility's decision on how to proceed with their documents once scanned into the imaging system.

Details for each of these steps is addressed in Appendix F, "Planning Checklist ." It also provides a sample timeline and designation of personnel involved in the process.

Step 4: The Implementation Phase

Now the real work of an EDMS begins--the implementation phase. In Step 4, you will establish a project management team, solidify your work plan, and create a management reporting methodology for the implementation. Work flow will be redesigned and decisions made based on input from your department and your EDMS vendor's project management team. During the process, you will be designing and redesigning many work flow schematics; this section includes a few samples. Finally, the implementation phase will include testing, training, and system go-live. This step in the practice brief provides useful guidance specifically related to document imaging technology because of the impact imaging has on the operation of the HIM department.

Project Management A strong project management team and plan will help assure a smooth and successful transition to an EDMS. This section provides you with resources and guidance in managing your project.

Implementation Team Roles and Responsibilities

Vendor Roles and Responsibilities

- **Project manager:** manages overall project and the vendor project team focusing on scope, time, cost, risk, and quality. Works closely with the enterprise project manager throughout the duration of the project.
- **Application consultant:** provides expertise in configuring the software product to meet the needs of the enterprise, in addition to providing the enterprise with support in determine how the product will work best within the organization.
- **Programmers:** provide expertise in coding the software product to meet the needs of the enterprise.
- **Technical consultants:** provides expertise in developing interfaces and conversions to meet the needs of the project. In addition, provides expertise on the database level requirements.
- **System engineers:** provides expertise on setting up the hardware and developing the databases.

Enterprise Roles and Responsibilities

- **Project manager:** manages overall project and the enterprise project team focusing on scope, time, cost, risk, and quality. Works closely with the vendor project manager throughout the duration of the project.
- **Enterprise analyst:** responsible for data collection, coding/configuring tables, documenting end-user functions, and analyzing system reports.
- **Functional area managers:** representatives from the departments/areas that will be using the system. Provide area-specific knowledge and are responsible for providing input to work processes, test plans, and policies and procedures.
- **Steering committee:** comprised of executive-level representatives from various enterprise departments who have a stake in the project.
- **Interface analyst:** performs data collection, coding/ configuration, and testing for interfaces. Develops technical specifications and test plans for interfaces
- **Network administrator:** evaluates and facilitates the network level activities required by the project.
- **Server administrator:** installs database-related software, monitors system operations, and performs system maintenance.
- **System administrator:** manages installation of hardware and software required by the project.
- **Desktop administrator:** responsible for workstation rollout required by the project.
- **Super users:** provide application support to end users during and after activation.
- **Training resources** (training coordinator, trainers): manages training process by determining training needs, developing training plans and classes, and performing end-user training.

Project Sponsors

Because the implementation of EDMSs and their components are far reaching in terms of organizational impact, involved and committed sponsorship of the project is critical to the successful implementation. Further, the sponsors of the project will be the visible champions and organizational spokespersons for the project. The importance of their role as key communicators to the senior leadership team and medical staff cannot be underestimated.

Project sponsorship can come from within the senior leadership of the HIM, information technology, or finance departments. Sponsors typically have a vested interest in the achievement of the goals set forth in the project charter. Because the goals of the project may range from the tactical (e. g., enable the medical record to be concurrently accessed by multiple users) to financial (decrease the cost of offsite storage) to technological (decrease the page to page response time for the EMR), there can be multiple sponsors.

Co-sponsors bring their own unique perspectives to the oversight committee and can be instrumental in broadening the understanding of the EDMS throughout the organization. As decisions need to be made that may impact upon the work flow of different constituent departments, project sponsors can be called upon as negotiators that work on behalf of the project team to secure buy-in and cooperation with necessary changes.

Project Charter and Scope

The project charter is developed in collaboration with the vendor and the oversight committee. This document serves as a summary of the current environment, defined scope of the project, goals and objectives, change control procedures, team responsibilities, staffing requirements, project monitoring, and escalation procedures for issues or concerns that develop during the implementation phase. While all components of the project charter are important, the project scope is critical to keeping the implementation phase on time and on budget.

The project scope is a list of items that will be addressed during the implementation phase of the project. This list is utilized to define what specific deliverables are with a clarification of expectations for each item. In an imaging project, this may include items such as which interfaces will be developed, the types of work flow tools that will be enabled, and the type of storage solutions that will be implemented.

The project scope is mutually determined by both the vendor and the organization and signed off by both parties. It also is an important point of reference for the duration of the project to reorient the various teams working on implementation as to the agreed-upon deliverables for the project. Failure to maintain the project within scope can often prolong the duration of the project and place it over budget. Out of scope requests that are brought forth by various constituents of the project are often added to a future considerations list. This list is often used postimplementation to determine needed enhancements to the end product.

Workplan

The project workplan is used to guide the execution of the project. The workplan identifies tasks to be completed as a part of the project and assigns resources to those tasks. In addition, the workplan includes hours and durations to complete tasks, as well as, the sequencing of the tasks.

There are typically five core processes utilized in developing a project plan. The five processes with examples of activities are included in Appendix G, "Project Plan Processes."

Management Reporting

Communication both within the project team and external to the organization is a vital component of the implementation phase. Keeping all constituents involved and updated will ensure identification of potential barriers to a smooth implementation and assists in the management of change within key customer areas. This communication is usually accomplished through the routine reporting of information in status reports to key groups. The table below shows examples of the types of reporting common to the implementation of an imaging system.

Management Reporting Common to the Implementation of an Imaging System

Type of Reporting	Audience	Information Provided	Frequency
Executive level	Senior leadership team	Variance from budget or timeline Showstoppers that require intervention	As necessary and at the completion of any major milestone
Organizational	Departmental leadership, key stakeholders, and medical staff leaders	Status to timeline, showstoppers, achievement of milestones, changes in scope, items with impact to general operations or work flow of key departments	Monthly and as necessary for urgent items
Project manager	Vendor and oversight	Status to timeline, showstoppers, status to budget, issues list, changes in scope, barriers, change to specifications, upcoming milestones and other critical project items	Weekly

Work Flow Redesign

The HIM department work flow changes significantly with the implementation of a document imaging system. Part of the implementation phase is to articulate assumptions, identify changes in the work flow, and make decisions as to which process to implement.

Discharge Control

Discharge control is a fundamental process for ensuring the timely pick-up or receipt of medical records. This is not a new process in HIM; however, it is an integral part of the entire document imaging process. The process includes tracking receipt of inpatient, outpatient surgery, and emergency discharge records, and accounting for and following up on any unreceived or missing discharges.

These questions will need to be considered:

- What shift/time should records be picked up and process for scanning taking into consideration coding, chart completion, and other retrieval needs?
- Would inpatient discharges be best processed by the graveyard shift?

Document Preparation

The document preparation process is the equivalent of chart assembly and loose material sorting in the paper chart environment. The document preparation process involves grouping, identifying, and preparing medical record documents prior to scanning so they can be scanned efficiently. This process includes

- Removing duplicate copies, staples, paper clips, notes, and tractor-feed edges;
- Checking and writing identification on each page of every document;
- Taping torn edges and big holes;
- Taping top and bottom of half-sheet or smaller sheets onto 8"-by-11" paper; and
- Grouping and putting in date order all linked documents (treatment episodes).

Scanning and Indexing Process

The scanning and indexing process is the equivalent of filing medical record documents in the paper chart. This process involves the following steps:

- **Encounter/batch cover page printing:** Printing encounter cover pages or batch cover pages to identify the batch, patient, and encounter where the scanned documents will be indexed. There are three requirements to index a document: medical record number and encounter/account/visit number, which are captured through bar codes on an encounter cover page, and document type, captured through a bar code on a form.
- **Document scanning:** The process of manually scanning batches of medical record documents.

- **Document indexing:** The process of manually indexing documents that fail through an automatic indexing process, including those that fail through electronic interfaces.
- **Problem document processing:** Handling of problem documents received as loose sheets that cannot be identified, document type does not exist in the database, form not bar coded, etc. The process includes returning unidentifiable documents to the source.
- **Interactive scanning and document modification:** Low speed or flat bed scanning of documents, especially odd-size documents. Interactive scanning is mostly used for rescanning or replacing documents.
- **Document imaging quality monitoring:** Assuring all documents are scanned accurately to the correct patient, account, and document type, and checking for the quality of images scanned. Quality checks must be done at each step of the document imaging process.

When interfaces exist between the ancillary systems (radiology, pathology, lab, and many others), scanning of interfaced documents is eliminated. However, documents that fail through the interfaces will need to be manually processed for indexing. (See Appendix H, "Document Imaging Process Flow Discharges," and Appendix I, "Document Imaging Process Flow Outpatients/Clinics and Ancillaries.")

Chart Analysis and Completion

The chart analysis and chart completion processes change as follows:

- **Chart analysis:**
    - Staff analyzes records online instead of the paper chart.
    - Records requiring signature are printed, flagged, and can be signed in the HIM department or delivered to the physician.
    - If document imaging system or transcription system has electronic signature authentication, flag/tag the deficient documents and electronically allocate deficiencies to the appropriate physicians.
- **Rescanning:** Signed paper documents, which are returned to HIM, are rescanned replacing the previously scanned deficient documents.

  (See Appendix J, "Chart Completion Work Flow.")

Coding

After medical records are scanned, the images are immediately available for the coders to use. The coders have two choices: View medical records online to code or use the original paper charts.

Things to consider in choosing the best option

- Speed of viewing documents
- Size of the monitors
- Coders' comfort level
- Workstations/ergonomics

Document Retrieval

For a period of time, both paper and electronic imaged records will need to be retrieved when requested. However, the chart retrieval process will diminish as more imaged documents become available electronically.

There are two options for retrieval:

- The medical record images can be retrieved by viewing the documents online
- If the user is unable to view documents online, the medical records can be requested and printed. This can be streamlined by creating "document sets" for each requestor or group of requestors

For release of information, copying is replaced by printing the images from the document imaging system. (See Appendix K, "Medical Records Retrieval Process.")

New Roles and Skills for HIM

As new technology is implemented with an EDMS, the HIM department will reorganize and new positions will emerge. New skills are necessary for virtually all positions in the HIM department, from director to clerk. An important part of the planning phase will be to understand and plan for the new roles, skills, and jobs of the reorganized HIM department.

To be successful, HIM leaders (directors, managers, and supervisors) must be open to new technology and willing to learn IT language. They must become technically savvy to ensure communication with the information technology department. In addition, project management skills are crucial to a successful implementation and maintenance of an EDMS.

Several new roles emerge in the HIM department implementing an EDMS using optical imaging technology. Sample job descriptions provided describe the basic skills needed to perform each of the new tasks and suggest minimum qualifications of the person doing the job. The size and scope of the project at a HCO will determine whether each job description will have enough work associated for a full-time position (the descriptions are written so that they could be combined if needed). The most effective job descriptions are based on the facility's or organization's missions and goals--the examples attached do not include any references to any missions and goals since they are specific to each organization.

The preparation and scanning positions are entry-level positions. A clerk, file clerk, or a person dedicated to assembling records will be best suited to perform the preparation and scanning functions because they would have prior knowledge of the forms and documents they would be working with. This would give existing staff a growth opportunity and an opportunity to use what they know today to continue being successful.

There are opportunities to provide additional assistance with these functions from other sources in the HIM department. Specifically, when records are assembled assemblers should be taught to remove all staples, tape down all documents, and so on. This will decrease the amount of preparation time, thus improving efficiency.

The indexing and quality control positions require more in-depth knowledge of HIM departmental functions. An analyst or senior clerk might transition into either of these two positions. The quality control position could be combined with other, supervisory type duties. It should be noted that educational suggestions for these positions are RHIT preferred.

Implementing an EDMS using optical imaging technology will cause changes to other traditional positions in the HIM department. For example, the release of information function will have references to retrieving records from optical technology as well as paper files and microfilm. In addition, depending on the system implemented, there may be a decrease in the time it takes to provide a copy of the record. These efficiencies may create a need to re-evaluate the release of information job duties and tasks assigned.

The HIM profession seems well prepared to move forward into an electronic document management world. The skill sets needed for the newly created positions still require basic HIM knowledge. Focusing on training will assist those currently working the field to transition to the newer positions more easily. (See the position summaries in Appendices L-O, "Indexing," "Preparation," "Quality Control," and "Scanning," respectively.)

Conversion Options--Outsourcing

In preparing for implementation, a HCO must consider its options for converting existing files and evaluating the staff resources available. Outsourcing may be a consideration for the conversion process.

Some outsourcing scenarios include:

- HCO-purchased in-house system, on-site conversion with HCO staff and management;
- HCO-purchased in-house system, on-site conversion using outsourced staff for some or all of the prep/ scan/indexing functions, outsourced staff doing conversion function on site;
- Vendor-owned and operated system and staff doing on site conversion; and
- Complete conversion done off site at conversion center with documents available to facility via Web, intranet, CD.

Testing

Before going live, the EDMS should be thoroughly tested to find possible errors. Use a testing plan to make sure things work as expected. What will be tested and who will test it is part of the plan. Testing is beneficial because it:

- Mirrors the actual production system,
- Can be done repeatedly in order to operate without failure,
- Can be done comprehensively as per design,
- Can be done by IT staff who will be familiar with IT issues, and
- Allows users to play an important role in testing the system.

Training

Training users and the leadership team is a crucial step in the implementation of an EDMS. Unfortunately, it's a task that is usually understaffed and under scheduled. A well-designed training program or plan will:

- Improve the chance of the EDMS being properly implemented,
- Change users', attitudes and behaviors toward the changes created by the EDMS, and
- Make a key contribution toward a successful conversion to an EDMS.

A training plan should identify

- Who will be trained (users, end-users, and leadership team)
- What's being covered
- How they are going to be trained (materials, handouts, lecture, slides, etc.)
- When they are going to be trained (timeline, length of session)

The following "Training Plan Outline" provides a list of key points to keep in mind when developing your training plan. (See also Appendix P, "Sample Course Plan".)

Training Plan Outline

	Description
Target Audience	• Identify who is going to be trained (leadership and end users). • Understanding the role of the user and their skill level helps prepare the trainer and can provide assistance when answering questions.
Course/Class Description	• The goals and objectives of the classes must be clear and well defined. • The objectives assist the trainer in developing the program content.
Trainer/Trainers	• Technical people should not be trainers. Use a professional trainer who knows how to educate and understands adult learning techniques, learning styles, and the psychological factors that impact users' perceptions and their ability to learn. • A train-the-trainer plan may be advantageous when preparing to provide training on various shifts. The plan provides the assistance of additional trainers, which is effective when providing many training classes to a large number of staff.
Training Setting	• The training environment must contribute to the learning process by making sure that the users are physically, socially, and psychologically comfortable. • A computer training room is a plus.

Schedule/Class Duration	• Numerous applications will increase the amount of time required for training. This means that more users need to spend more time in class and away from their work responsibilities. • Training sessions should be as close to the go-live date as possible. Shorter, more frequent classes may improve the amount of information users can absorb at one time and improve the ability to schedule staffing coverage.
Training Aids	• Keep in mind adult learning principles and styles when creating educational materials. The trainer may find that using the computer along with a workbook with procedure steps is helpful. Handouts, reference aids, and storyboards from the vendor can be helpful.
Evaluate	• Determine whether to give the users a written exam or a practical evaluation. Evaluation of the training technique provides feedback regarding the users' reaction and the trainers' abilities. Post-testing after training is an effective way to measure users'skills and knowledge. The evaluation also provides feedback regarding the ability of the users to transfer and apply skills and knowledge learned in training to actual work setting.
Follow-up	• Follow-up during the first go-live will immediately help the users with the transfer of knowledge learned in training to the real environment. This will also provide an opportunity to communicate any changes that have occurred during the period between the training and go-live.
Ongoing Training	• Training is ongoing. Training does not end once the EDMS is in production. New employees, new releases, new policies and procedures will create the need to review and redefine training continuously.

Ensure that training and user manuals are readily available. One option is to have an electronic format of the manuals residing on the HCO's intranet for easy access.

Step 5: The Postimplementation Phase

Your EDMS is live and operational and your HCO is another step closer to a complete electronic health record. In the postimplementation phase, you will continue to refine the EDMS work flow, make revisions to staffing and roles, and begin taking a closer look at documents within your HCO. Newly created file space will require management decisions while the project team determines how to provide ongoing training and maintenance of the system. Finally, you'll want to begin measuring your success and ensuring your HCO realizes the return on investment and benefits promised by the EDMS.

Handling Issues Unique to EDMS Operations Creating facility policies and procedures related to the EDMS will provide consistent guidance to all facility employees. The policies and procedures should be reviewed to ensure consistency with laws and guidelines set forth by regulatory, state, and federal agencies. Facility leadership, HIM, information technology, information security, quality assurance, and clinical staff should be included in the process of developing the HCO's policy and procedures. The HIM department will need to develop policies and procedures specific to the document imaging process and related issues. Here are some specific issues unique to EDMS that need special attention and guidance.

Corrections: Policies and procedures should identify how this procedure is done and by whom. Business rules may determine who can access and correct unsigned documents. Facilities should develop guidelines for changes made to signed and unsigned documents.

For example, if a document is changed/corrected, typically the copy with the error is removed from view within the EDMS. However, a copy of the original document must be available. This can either be a manual or electronic process. It is important

that all staff are aware that these documents are available if needed. You may make some type of annotation in your EDMS system so that clinical staff will know who to contact if they feel they may need to see the original document.

Retraction, reassignment, resequence: Define these terms as they do have different meanings and the actions to be carried out differ.

- **Retraction** involves removing a document for standard view, removing it from one record, and posting it to another within the EDMS. In the record from which the document was removed, the document would not be considered part of the designated record set or visible to anyone. Typically, the privacy officer or designee would have the ability to perform the action and view/print the retracted document. An annotation should be viewable to the clinical staff so that the retracted document can be consulted if needed.
- **Resequencing** involves moving a document from one place to another within the same episode of care. No annotation of this action is necessary.
- **Reassignment** (synonymous with misfiles) involves moving the document from one episode of care to a different episode of care within the same patient record. As with retractions, the privacy officer or designee would have the ability to perform the action and view or print the reassigned document. An annotation should be viewable to the clinical staff so that the reassigned document can be consulted if needed.

Updated documents: In an EDMS system, updates to documents may not always be readily apparent to clinical staff. Examples of such documents include problem lists, advance directives, and growth charts. In some cases the same document is updated at each episode of care, yet others generate a new document entirely. It is essential that clinical staff see the most up-to-date document. "Version control" is a way to alert clinical staff to that there is an update. Several systems offer an electronic means to communicate this to the providers within an EDMS. If your system does not have an electronic method, then manual tracking and notification may be necessary.

Time frames and hierarchy: There are three main categories for the scanning process: real time, scanning at discharge, and scanning when deficiencies have been cleared and the record is considered complete for filing. Define what you consider to be your legal record and how that record is to be sequenced. Then determine what time frames for scanning documents into the EDMS are acceptable. It is important to reference facility bylaws and regulatory agency guidelines when developing time frames. Once established, all clinical staff should be made aware of when documents should be available for viewing in the EDMS.

Forms committee: Include IT staff in the forms approval process to help determine if a new form can be created electronically (thus eliminating the need for scanning) or what technology can be used to help automate the process. Facilities should also consider automating the forms approval process.

Use of Newly Created File Space as a Result of EDMS

Many factors may impact available file space created as a result of document conversion with an EDMS. The implementation timeline of the system purchased, type of conversion (in-house versus off site), location of space available (HIM department versus enterprise-wide availability) all affect the outcome.

Though this decision may fall to the HIM director, there is a significant chance that it will be decided upon by executive management or the EDMS team/task force. An enterprise-wide EDMS may bring with it an enterprise- wide decision for use of this newly available space.

With space (real estate) at a premium in most facilities a HCO often justifies an EDMS by using the file area in the HIM department for revenue-generating services. This can result in lost space for HIM.

Space in other departments where redundant and shadow files are kept may also become available as a result of an EDMS. Shadow files are often created by other departments for convenience and security of having the information needed quickly without dependence on deliveries or pickups from another department. An EDMS eliminates the need for these files, making that space available. Such space could mean the ability to add another treatment room to the emergency department.

A HCO with an in-house system may use the file space for a centralized conversion center. Remote file space can be used for a clinic or physician office space.

Timing is also a factor. Outsourcing the complete conversion function to an off-site conversion facility may make the space available within a short period of time, while other conversion methods may take longer.

Existing as well as future space needs must be considered before committing the space for a specific purpose. Consider what new programs or services are being put in place and what space will be required for them.

Ongoing Training Needs

Perhaps one of the most overlooked aspects of maintaining an EDMS is end-user and leader training. Without properly trained users and leaders, the full benefits of an EDMS will never be realized. Therefore, proper training is essential to explain all new procedures and opportunities associated with the system.

Over time, new staff will need to be trained. Future software releases and platform conversions mean that more training will be needed. In addition, policies and procedures are dynamic, requiring new and retraining on an ongoing basis.

Although help desk staff might be available, the main purpose of ongoing training is to make users self-sufficient--capable of answering their own questions in an efficient manner. Therefore, in order to make ongoing training as effective as possible, use evaluation surveys to help collect information about the existing course materials, job aides, instructors, and format to help refine and constantly improve the training.

Ongoing Maintenance

Ongoing maintenance is a critical step in the success of electronic document management. Each HIM department should have a plan in place that addresses this process. Three main areas for consideration are hardware, software, and personnel.

Read the documentation enclosed with hardware for routine maintenance tests and tips. Keep to a maintenance and image calibration schedule for optimal hardware operation. Document image calibration should be performed according to manufacturer instruction as part of routine maintenance.

Another hardware consideration is budgeting for ongoing needs. Your facility's IT staff or vendor can assist with defining the necessary ongoing hardware requirements and the projections for the related costs.

Keeping current with software versioning is very important for system operation. Ask your vendor or facility IT staff how you can proactively keep up with software updates and enhancements and how to check workstations to ensure the most up-to-date version of the software is installed. In addition, long-term storage of documents may necessitate keeping an older/different version of the software for archived image retrieval as technology advances and new software is loaded.

The last area for consideration is personnel. Have a review cycle in place that includes, at minimum, validation of the facility and departmental EHR policies and procedure manual(s), process for re-evaluating skills for existing scanning staff on an annual basis, and training new staff in HIM and other areas throughout the facility in document retrieval and in the scanning process (as applicable). Finally, have a plan in place for assigning and monitoring access by user class and for timely termination of access as employees leave their jobs.

Each facility will have a slightly different version of how the three main areas for consideration are addressed. The key for successful ongoing use and maintenance is identifying how each area will be monitored and document the details of that monitoring process.

Benchmarks

Productivity and benchmarks are helpful in planning, implementing, and evaluating an EDMS. Appendix Q, "Benchmark Productivity Standards," provides some sample statistics.

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Glossary

Automated forms processing technology: A component technology of an EDMS. This technology allows users to electronically enter data into "online forms" and electronically extract the data from the online forms for various data manipulation purposes. Powerful contextual verification processes have made such operations highly accurate. In addition, the form document is stored in a form format--as the user sees it on the screen--for ease of interpretation.

Bar code symbology: The printed code used for recognition by a bar code scanner (reader). Traditional one-dimensional bar codes use the bar's width to encode just a product or account number. Two-dimensional bar codes, such as PDF417, MaxiCode and DataMatrix, are scanned horizontally and vertically and hold considerably more data. PDF417 is widely used for general purposes. MaxiCode is used for high-speed sortation, and DataMatrix is used for marking small parts.

Batch scanning: documents are scanned (i. e., processed) in batches instead of one document at a time.

Character recognition or automatic identification Technology: A component technology of an EDMS. This technology quickly and accurately enters character or symbol data into computer systems from analog, paper forms, or other analog documents. Some of the more common character recognition technologies include bar codes, optical characters (e. g., preprinted account numbers on paper bank checks), commonly known as optical character recognition (OCR), optical marks (e. g., filled-in circles by Number 2 pencils on SAT exam forms), commonly known as optical mark recognition (OMR) or Mark Sense, and intelligent characters (e. g., hand-printed alphanumeric characters on forms or other paper documents), commonly known as Intelligent Character Recognition (ICR). The use of this technology speeds the scanning and indexing processes required of document imaging technology.

Context management: (see CCOW)

Clinical context object workgroup (CCOW): Publishes standards for the visual integration of cooperative interaction among independently authored healthcare applications at the point of use. "Visual integration" emphasizes the specific scope the workgroup chose to address: applications with graphical user interfaces operating together on a personal computer or workstation.

Version 1 of the standard, the Patient Link, supports synchronizing the applications for a selected patient. When the user of an application changes the selected patient, the other applications on the workstation follow the change. This cooperation frees the user from the tedium of repeating the action in more than one application.

Deferred mirroring: A form of content replication process in which an information system defers updating backup volumes within a mirror set, typically to the end of the processing day. It then copies the data, such as image data, from the master volume to all backup volumes.

Destination path: Represents the storage endpoint of data or items. The path contains a server, volume, and directory specification that point to a location in the system where the data will be written.

Digital document indexing technology: A component technology of an EDMS. This technology denotes categories of information, such as metadata, by which documents are tagged for retrieval purposes and then delineated for a particular application. The indexing process involves analyzing the content of a document, determining the appropriate values for

designated indexing fields, and automatically entering the values into the system. In healthcare organizations, the several sections of the patient medical record are most commonly indexed: discharge summaries, histories and physicals, laboratory/ radiology results, medication administration records, nursing notes, physician notes, correspondence, etc.

Digital document retrieval technology: A component technology of an EDMS. This technology coordinates the search and subsequent printing of the document to screen. Unfortunately, many digital documents are still printed to paper or film for storage, human interface, and distribution purposes.

Digital signature management technology: A component technology of an EDMS. This technology offers both signer and document authentication. Signer authentication is the ability to identify the person who digitally signed the document. The implementation of the technology is such that any unauthorized person will not be able use the digital signature. Document authentication ensures that the document and the signature cannot be altered (unless by means of showing both the original document and the change document). As such, document authentication prevents the document signer from repudiating that fact.

Digitization: In document or diagnostic imaging technology, digitization is the process of capturing analog document as a collection of binary digits (pixels) using a scanning device. Digitization is a precondition for electronic storage, such as magnetic storage, storage on optical disk, and character recognition (e. g., ICR, OCR).

Direct attached storage devices (DASD): Disk drives contained within the computer cabinet and connected to the CPU via a peripheral bus. Contrast with NAS devices (network attached storage devices) or SAN devices (storage area network devices), which are external storage units connected to workstations and servers over the network.

Document: Any analog or digital, formatted, and preserved "container" of data or information. This container of data or information is humanly interpreted in an audible, readable, or visual manner. For example, documents (not data) are required for evidentiary discovery purposes. To settle legal disputes, the transaction *presentation* (i. e., the document), and *not representation* (i. e., the data), is required for all business records. In healthcare organizations this involves the retrieval of the bill "document" (not the bill's structured, coded data), the consultation report "document" (not the report's unstructured, text data), or the photograph or image "document" (not the photograph or image's unstructured, bitmapped data).

Document Capture: The process of accepting information through acceptable capture devices in an EDMS. The document imaging technology component of an EDMS transforms captured analog information into an electronic or digital representative form to allow for the management of the document similar to management approaches in an analog paper-based system. Document capture may be performed using a variety of technologies, including scanners, electronic forms, electronic transactions, cameras, voice, and video. In the case of text-based documents, document capture may be performed by rekeying the information contained in the document.

Document content management technology: A component technology of an EDMS. This technology takes into account the internal classification of a document and the metadata associated with it. As such, the technology electronically manages the creation (authorship), distribution (publication), and customization of an entire document, section, or part of a document. For example, in healthcare organizations, the document content that must be created, distributed and customized could be that of a multipaged spreadsheet.

Document imaging: The online storage, retrieval, and management of electronic images of documents. The main method of capturing images is by scanning paper documents.

Document imaging systems replace large paper-intensive operations. Documents can be shared by all users on a network, and document routing can be controlled by the computer (see work flow technology). The systems are often simpler to develop and implement than traditional data processing systems because users are already familiar with the paper documents that appear on screen.

Document images are stored as bitmapped graphics, and although a small amount of text (keywords) may be associated with the document in order to index it, the meaning of the document content is known only to the human viewer, not the computer. Like microfilm, signatures and other original markings remain intact.

Document imaging technology: One, and *only* one, of the many component technologies of an EDMS. This technology electronically captures, stores, identifies, retrieves, and distributes documents that are (1) not generated digitally and are stored on paper and/or (2) are generated digitally but are stored on paper. These analog documents must be digitally scanned (i. e., faxed) in order to capture (in this case, bitmap) the document's data. Scanning devices (similar to facsimile machines) are used.

Document management technology: A component technology of an EDMS. This technology provides core library services for documents. In other words, the technology is concerned with the external classification of a document--the index fields and the keywords chosen to describe the document. As such, document management technology automatically organizes (as in chart assembly), secures (as in HIPAA regulations for security-- audit trails, encryption, etc.), and shares documents. Some of the more common document management functions include document version control, check in-check out control, document access control, and text or word searches.

Dynamic mirroring: A form of content replication process in which an information system writes the content to several storage points in the system. A storage point records the content to a computer medium. A retrieval request for the content returns the content from any valid storage point. Dynamic mirroring represents a master volume and a backup volume that are written simultaneously.

Electronic document management system (EDMS): Any electronic system that manages documents (not data) to realize significant improvements in business work processes. Like most information systems, EDMSs consist of a number of component technologies that support both analog and digital document management.

Enterprise report management (ERM) technology (formerly known as computer output laser disk [COLD] technology, and, today, often written as COLD/ERM): A component technology of an EDMS. This technology electronically stores, manages, and distributes documents that are generated in a digital format and whose output data are report-formatted/print-stream originated. Unfortunately, documents that are candidates for this technology too often are printed to paper or microform for distribution and storage purposes. ERM technology not only electronically stores the report-formatted documents, but also distributes them with fax, e-mail, Web, and traditional hard-copy print processes. In healthcare provider organizations, typically such documents include "green bar" financial system report documents, Uniform Bills (UBs)/CMS 1500s, laboratory cumulative result summary report documents, and transcribed word-processed medical report documents.

Image combining: The process of taking two or more bitmapped images and combining them to make a single bitmapped image. An example of a combined image is a bank check, where the front and back are stored as individual files. These two images are subsequently combined to form a single image presented to an end user.

Image-enabling: Refers to adding document images to an existing database application. Image-enabling allows end-users to view document images from the existing database application's "viewer" or user interface (i. e., the application's look and feel). End users do not need to know an EDMS exists. They just keep doing what they did before the arrival of the EDMS by working in their usual business applications. As such, image-enabling saves on training and retraining, and it extends or improves the existing database application's usefulness by making it image-capable.

Index key: A character string in an archive file that is used as a file locator. Examples include account numbers, social security numbers, and customer names. Index key values are extracted by indexing expressions when files are archived. Search expressions locate the index key value in the archived file and display appropriate data. (See *digital document indexing technology.)*

Integration server: A computer containing software that enables one application to communicate with another on an ongoing basis. The foundation of an integration server is a message transport service such as MQSeries. Other higher-service layers provided include data routing and reformatting. An integration server is also known as a "message broker."

Magnetic storage: Different types of magnetically coated media traditionally used in computing to store data and programs. Information is written to magnetic storage (e. g., tape, floppy disk, or hard disk) by the read/write head, which changes the polarity of individual regions of the medium. In contrast to microfilm, magnetic storage merely records the information itself and its form or image.

Nonpatient centric: Items that are not directly related to a patient; for example, in an EDMS, age trial balance reports are nonpatient centric.

Records management technology: A component technology of an EDMS. Business records are bound by legal and regulatory requirements. Consequently, formats for long-term preservation, storage media for long-term viability, and strategies for migration and accessibility require records management technology components that must ensure the authenticity, security, and reliability of an organization's electronic records.

For example, mass storage technology is required for the massive amounts of structured and unstructured data as well as the large number and kind of documents stored in EDMSs. The major mass-storage medium used in EDMSs is magnetic, including disk, redundant array of independent disks (RAID), or tape options. For extraordinarily large amounts of data and lengthy document archive requirements, the optical medium is used, including compact disk-read only memory (CD-ROM), digital versatile disk (DVD), or write once read many (WORM) options.

In addition, like documents, analog and digital records have a life cycle. EDMS records must be properly classified under appropriate categories so that appropriate legal and regulatory retention rules can be applied. Users must determine how to identify and declare these records so that the records and/or record documents can be deleted/destroyed (i. e., purged) at a defined point in their life cycle.

Registration scanning: Document capture that is performed at the point of registration. Documents such as driver's license or insurance cards are scanned, indexed, and stored in the EDMS.

Storage area network (SAN): A network of storage disks. In large enterprises, a SAN connects multiple servers to a centralized pool of disk storage. Compared to managing hundreds of servers, each with their own disks, SANs improve system administration. By treating all the company's storage as a single resource, disk maintenance and routine backups are easier to schedule and control. In some SANs, the disks themselves can copy data to other disks for backup without any processing overhead at the host computers.

The SAN network allows data transfers between computers and disks at the same high peripheral channel speeds as when they are directly attached. Fibre channel is a driving force with SANs and is typically used to encapsulate small computer systems interface (SCSI) commands.

SANs can be centralized or distributed. A centralized SAN connects multiple servers to a collection of disks, whereas a distributed SAN typically uses one or more fibre channel or SCSI switches to connect nodes within buildings or campuses. For long distances, SAN traffic is transferred over ATM, or fiber. To guarantee complete recovery in a disaster, dual, redundant SANs are deployed one a mirror of the other and each in separate locations.

A SAN option that is expected to become popular is Internet protocol (IP) storage, which enables data transfer via IP over fast gigabit Ethernet locally or via the Internet to anywhere in the world

Universal, global, or patient level documents: Documents associated with a patient at the medical record number (MRN) level. Global documents can be seen on each encounter for the patient. Documents associated at the encounter are generally not seen when viewing another encounter for the same patient. This is not true for global documents, which are visible for every encounter. Examples include advance directives and insurance cards.

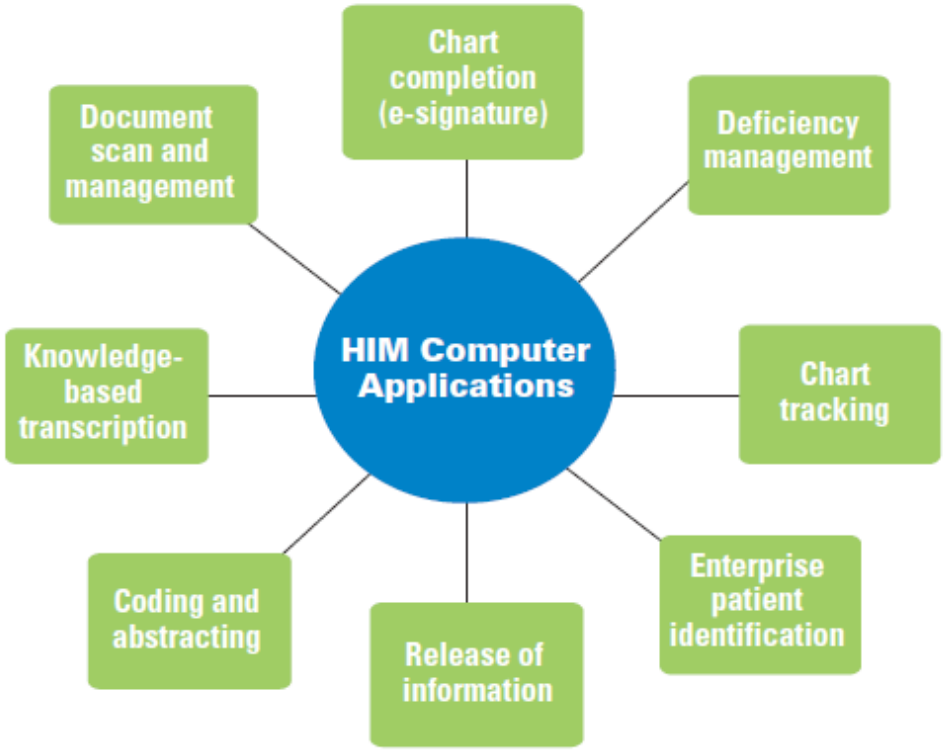
Virtual folder: A type of folder dynamically assembled at the time of the request. The virtual folder may represent a subset of a static folder or a crosssection of static folders. Examples include a folder that represents a particular business type, such as driver's license, that encompasses the entire foundation; and a folder that represents content collected for the day.

Virtual rescan (VRS): An electronic checkpoint for scanned images that ensures that only the highest quality images and data are captured. As images are scanned, VRS software performs a multipoint inspection of each document. VRS instantly and automatically checks and adjusts for correct alignment, brightness, contrast, and image clarity. Any inconsistencies are immediately corrected so that only the straightest, most readable images are moved into the EDMS.

Web content management technology: A component technology of an EDMS. This technology specifically manages documents on Web sites. It provides for the storage, maintenance, and retrieval of HTML and XML documents and all related elements. It provides publishing capabilities to export content not only to the Web site, but to any mass storage device or print medium. Typically, Web content management technology is built on top of a native XML database.

Work flow technology: A component technology of an EDMS. This technology allows computers to add and extract value from document information as documents move throughout an organization. The documents can be assigned, routed, activated, and managed through system-controlled rules that mirror business operations and decision processes. For example, in healthcare organizations, work flow technology automatically routes electronic documents into electronic in-baskets of its department clerks or supervisors for disposition decisions.

Appendix A



Appendix B: Specific Forms Characteristics

General

- All documents should have a size of 8½ by 11 inches.
- Booklets and "foldouts" (e. g. nurses' flow sheets) should have a perforation at the "bound" or "foldout" edges for ease of separation into 8 ½ -by-11-inch pages during scanning preparation.
- Quarter-inch border (on each side of document without bar code)--half inch border (side with bar code)
- Mnemonic descriptor and or inventory number may be used for non-bar-code recognition engine.

Paper

- White paper is recommended for all documents that will be scanned, because white will provide the best results for bar code ID, OCR, viewing, etc.
- Shading of "bars" that contain text is not recommended, because the text typically will not be readable after scanning.
- If colors are required for ease of manual identification, a color border around the edge with a white center is recommended.
- Minimum of 20 lb. weight bond paper is recommended for best scanning results.
- Twenty-four lb. weight is recommended for double-sided forms to prevent bleeding through of ink and information during scanning.

- Do not use glue on the leading edge of a form. The edge that has been separated results in a curled edge and will be misfed into the scanner. Also, the glue will build up quickly on the rollers and cause jamming.

Identification

- Twelve-digit bar code (see format below)
- A document should use a unique identifier or mnemonic descriptor.
- Up to 12 character mnemonic descriptor (with 12 point font).
- The bar code and mnemonic descriptor must be related to a document type. This is typically associated during the application setup when setting up document rules.

Other Items That Must Be Considered and Addressed

- Note that portrait docs will typically be three-hole punched at the top so they can be put into a medical record chart holder (left-hand side of landscape docs will be three-hole punched).
- Holes across the top of a page could result in paper not being fed properly or jams, if the holes have been ripped and are not taped.
- Note potential for three-hole punch on left side of some portrait docs (and tops of some landscape docs) for standard three-ring-binder applications.
- Some foldout forms have a data column on the fold. These forms must be redesigned so that the perforation or "cut-out" is not on the data column. Note that a minimum inch "neutral zone" on either side of the perforation or "cut-line" is recommended to ensure data is not lost.
- When designing forms, it is important to not place information on the "back" side of the page in the same area as the bar code is on the opposite side. This could bleed through during scanning and cause the bar code not to be readable in the scanned image.
- Avoid small fonts; 8 point or larger is recommended.
- All forms should be either computer-generated or printed on a laser printer. Bar codes do not read correctly from copied forms.
- Review charts for use of colored stickers (bright pink or yellow with black print)--scanners may see these stickers as an all black area.
- Avoid designing documents with inconsistent page orientation (e. g., page 1 of a document is portrait, page 2 is landscape, page 3 is portrait). Input systems may rotate images according to the orientation specified in the system setup. Orientation is typically set for the entire document, not each page of a document.

Appendix C: Bar Code Information and Guidelines

Code 39 Supports the Following Characters:

- Twenty-six uppercase letters (A through Z)
- Ten digits (0 through 9)
- Seven special characters: minus sign (-), period (.), dollar sign ($), forward slash mark (/), plus sign (+), percent sign (%), and space ( )
- Start and stop characters, represented by an asterisk (*)

Code 39 Is in the Following Format

- A leading "quiet" (blank) zone
- The start character (*)
- Data characters, with characters separated by an intercharacter gap (blank space)
- The stop character (*)
- A trailing "quiet" (blank) zone

Bar Code Content

If standard forms are currently identified using a numeric or alphanumeric character string (e. g., MC1234), then configure the imaging bar code using that same numeric or alphanumeric string.

Bar codes can be used to identify the document and/ or encounter number.

Placement of Bar Codes on Forms

When determining bar code placement on a form, it is important to consider the location of any addressographs and/ or stick-on labels that may be applied to each document type. Also, the bar code may be preprinted on a form or printed on an adhesive-backed label that is manually applied to the form prior to scanning. There should be one bar code per form, and it should be placed in an area with the proper leading and trailing quiet zones as previously described. If the form's corners will be susceptible to wear, curling, fraying, or tearing, placement in these areas should be avoided.

- A unique bar code is recommended for the front page of every document that will be scanned and indexed. This means
    - A unique bar-code *must* be on the front side of a duplex document (required to ensure both sides [image] are properly indexed in the correct page order).
    - A unique bar code *must* be on the front side of a multipaged document (required to ensure all sides are properly indexed). Length of document is determined by a setup value.
    - A bar code is not required on the back (" blank") side of simplex documents, as these pages may be scanned in a batch that is being scanned in duplex mode, but they will not be indexed.
    - All bar codes should be oriented to the same direction, either parallel to the direction that the paper travels or perpendicular. This will make scanning and reading of the bar codes more efficient and consistent.

The bar code must be surrounded on all sides (above, below, to the left, and to the right) by at least 0.25 inches of blank or clear space. This blank space comprises the leading and trailing "quiet" zones discussed in the preceding section of this document.

Print sample bar-coded forms to use for testing. If the location of the bar code is causing difficulty, reposition it. Each form should be scanned 30-50 times to test for a successful reading. Only when you are satisfied that a code and orientation is correct, and has been successfully tested multiple times, should you conduct a full form redesign and printing.

Appendix D: Helpful Justification and Return on Investment Statistics

Facility Data

- Number of beds
- Number of clinics
- Number of inpatient visits per year
- Number of outpatient visits per year
- Number of ambulatory visits per year
- Number of emergency visits per year
- Location of clinical areas including off-site satellite clinics

Storage

- Size of the HIM department
- Cost per square foot
- Cost of microfilming per year
- Cost of off-site storage per year (including retrieval)
- FTEs
- Number of FTEs dedicated to file management functions
- Labor costs (including benefits)

Volume

- Volume of charts requested on a
    - Daily basis
    - Weekly basis
    - Monthly basis
    - Annual basis
- Areas requesting charts
    - Internal departments or locations
    - External departments or locations
- Retrieval rates
    - Percentage of charts successfully retrieved on a daily basis from what is requested
    - Time studies that would include average length of time for file functions per FTE

Technical Denials

- Amount indicating lost revenue due to missing charts

Litigation Cases

- Potential money lost due to missing charts

Appendix E

Justification for an EDMS: Tangible and Intangible Benefits

Justification	Tangible Benefits	Intangible Benefits
Improved clinical staff access to the medical record for purposes of patient care	• Timely access to patient's historical medical records • Assurance that current data will be available for future encounters • Ensures continuity of patient care amongst healthcare providers • Potential decrease in medical errors	• Enhances quality of patient care • Potentially improves patient safety • Efficiency leads to overall patient satisfaction and excellent customer service
Simultaneous access of system by multiple users for clinical, administrative, and other healthcare operations	• Improves staff efficiency • Increases staff productivity • Reduces turnaround times for reporting purposes • Faster feedback on quality improvement activities • Ability to allow other business offices and ancillary departments to archive documents other than the medical record to create their own efficiencies	• Efficiency leads to overall patient and staff satisfaction
Reduce and redefine staffing complement and competencies (more technical and diverse	• Reduce number of FTEs dedicated to file management functions	• Streamlined operations overall creates new efficiencies

skills to utilize systems and multitask)	• New roles and skills for staff	• Enhances HIM department image • Overall hospital image is seen as technically advanced
Disclosure (availability of information for purpose of timely disclosure)	• Streamline ROI operations by reducing turnaround time • Provides almost 100% retrieval rates for requested information • Enables easy archiving of correspondence requests and authorizations (which no longer should be filed in the back of the chart, as it is no longer pulled to satisfy a request) and amendments and related correspondence associated with them • Enables ROI staff to verify signatures on authorizations and review for any additional state-required authorization	• Promotes positive customer service • Improved ability to satisfy on-demand requests • Allows facility to make strategic decisions regarding how correspondence will be processed and who will do itÑ outsource or take on full correspondence service to bring in revenue directly to the facility (or some combination of both) • Other healthcare providers can have timely access to patient records for follow-up care outside the organization
Improved ability to employ privacy and security measures (defining access rights, audit trails)	• Ability to assign role-based access to PHI • Employ minimum necessary access to reduce security breaches	• Improved public trust and confidence that facility is able to keep information confidential
Supports compliance efforts with HIPAA, Joint Commission, and other regulatory bodies	• Online review process vs. paper chart review yield greater compliance • Ability to quickly retrieve data on short notice • Notice of Privacy Practices acknowledgements and other required documentation can be maintained • If Office for Civil Rights investigates, can provide them with audit logs and protocols for role-based access • Advanced Beneficiary Notice and Local Medical Review Policy documentation can be maintained	• Ability to achieve and maintain consistent compliance
Improved capture and routing for all documents	• More orderly flow of paper trail • Significant decrease in missing documentation	• Ensures integrity of the medical record
Access for peer review organizations audits impacting reimbursement, decrease of technical denials, revenue enhancement	• Improves revenue enhancement • Consistently ensures regulatory compliance • Addresses timeliness and response to Medicare additional document requests	• Simplifies administrative processes by avoiding follow-up related to technical denials based on missing documentation

Reduced file management and storage, which may allow for less need for physical space	• Significant savings on file storage • New use of current file space for other hospital operational needs • Eliminates or significantly reduces administrative costs of copying and supplies	• Can dedicate more physical space to patient care areas and other revenue generating enterprises
Effectively ties in offsite or satellite clinical areas	• Reduces need to move the physical charts between separate geographical areas to access the information • Reduces labor and other associated costs • Enhances patient care	• Eliminates or significantly reduces efforts to file, transport, track, and search for lost records • Avoids potential privacy breaches • Patient satisfaction
Improved operations (new work flows)	• Existing operations will realize efficiencies as a result of automation • Potential reduction of FTEs • Reduces or eliminates chart retrieval activities • Reduces or eliminates filing activities • Reduces or eliminates chart assembly activities • New roles and skills for employees	• Overall efficiencies create greater staff and customer satisfaction • May assist in retaining and recruiting FTEs • Professionalizes HIM services • Allows organization to consider other approaches to work including outsourcing
Utilization of EDMS technology to manage documents specific to other business needs of the facility beyond HIM	• Other facility departments with business record storage needs can employ EDMS technology to manage their documents such as registration, patient financial services, contract compliance, radiology • All related documents are located in one folder • Access controlled through security	• Streamlines operations • Frees up physical storage space • Allows areas to achieve retention requirement for various documents • Enables access to documents needed for reimbursement • Greater security controls by establishing role based access to sensitive information • Customer satisfaction
Maintains the continuity of online access by incorporating handwritten documents that are created during downtime for other clinical information systems	• Supports data integrity and business continuity plan • Supports emergency downtime or disaster preparedness	• Enables facility to continue to deliver quality care • Impacts patient safety • Customer satisfaction with reliability, stability, and trust with the organization

Improved coding/abstracting processes and accounts receivables processing time	• Streamlines revenue cycle process • Information readily available for coding and abstracting • Allows for implementation of home-based coding • Promotes accurate reimbursement and better accounts receivables management	• Facilitates review process by DRG coordinators to ensure accuracy of coding • Enables facility to entertain a variety of options to staff and attract coders
Interface or component of EDMS technology which enables electronic signature for specific documents	• Improve turnaround time for specific record completion activities for any dictated reports • Provide efficient and streamlined services to physicians • Allows for charts to be completed and filed to permanent storage in shorter time frames • Reduces HIM department's administrative activities to employ sanctions for delinquent physicians • Ensures compliance with regulatory bodies such as the state and Joint Commission	• Physician, staff, and outside customer satisfaction • Allows for timely completion of all required documentation • Potentially impacts patient safety • Allows for timely follow-up disclosures for release of information activities

Appendix F: eHIM Imaging Sub Task Force on Planning—Planning Checklist

			Who should be involved?												
Category/tasks	**Objective of task/comments**	**Time frame from implementation (T-x months)**	**HIM**	**CFO**	**Medical Staff**	**Nursing/Ancillary/Clinical Staff**	**Information Technology**	**Patient Registration**	**Pt. Fin. Services (Business Office)**	**Environmental Services**	**Vendor**	**Other?**	**Legal Affairs/ Risk Management**	**Human Resources**	**Office of Organizational Learning**
Assembly	To ensure the record is in the optimal physical order for efficient processing for those records needing to be scanned.	Any time prior to implementation.	X		X	X									
(a) Receiving the chart	Receiving all charts from all areas (reconciliation process.)		X		X	X									
(b) Sequence of the forms	Assembly list in place with forms numbers		X		X	X									
(c) Chart dividers	Paper or plastic; return to floor, keep or dispose														
(d) Prepping the documents	Removal of staples, overlapping documents, vertical positioning, ID on each form		X		X										

Types of records	To determine where each of the following is stored, and how reconciliation will occur on a daily basis (check in and account for each chart, even outpatients)	Several months prior to live date, create grid			
Centralized or decentralized	Will you perform daily reconciliation in HIM or elsewhere? Are there enough computer terminals? Can you use bar coding?		X	X	
Inpatients			X	X	
Outpatient diagnostic/ancillary			X	X	
Emergency			X	X	
Outpatient in a bed (day surgery, observation, other)			X	X	
Specimens	Will order be stored with record?		X	X	
Home health			X	X	
Long term acute care			X	X	
Physician's offices	Ownership issues must be addressed		X	X	
Rehabilitation			X	X	
Behavioral health			X	X	
Series charts	If using a longitudinal record, can you check in individual recurring visits (i.e. for radiation therapy?)				
Special considera-tions (ICU, NICU, OB, Peds, etc.)			X	X	
Shadow records?	Will copies be destroyed once original is online or are they needed at all now that EDMS is in place?		X	X	
Forms Inventory/ Format	Create inventory with sample of each form		X	X	X
Unique numbering: internal, external, computer generated	Different numbering may be required for different modes of generation. Eventually these can be bar code embedded onto document for automatic form type recognition to speed processing during scanning.		X	X	X
Similar design: best practices					
(a) All white (color stripe if needed)			X	X	
(b) Same size letter paper			X	X	

(c) Vertical format preferred			X		X			
(d) No shingle sheets			X		X			
(e) No staples or tape			X		X			
(f) No highlighter; only black or red ink			X		X			
(g) Addresso-graph bottom right corner			X		X		X	
(h) Same place for facility identifier			X		X			
(i) Forms name number bottom left/center top			X		X			
(j) 3 hole vs. 5 hole punch			X		X			
(k) Paper dividers (reusable) with major sections			X		X			
Loose/late reports	Determine policy on receipt of loose reports; add in order or file in back of chart; how codified once entered into system.	When procedures are written.	X		X			
Process for measuring and reducing			X		X			
Used for coding or not?			X					
Sequential or not?	If scanning, will forms first be sorted by date for easier reference later, or randomly once received? If the former, must have all loose reports from dates materials [sic] before final scanning occurs.							
Will deficiencies coming in (i.e. dis-charge summary) be scanned later, or will chart be held for final scanning?			X					
Physical Layout of Equipment	Determine workflow in HIM Department	6 months prior to purchase or earlier (in time for capital equipment approval)	X					
Analysis and deficiency and electronic signature process	To assure that the medical record is complete and that entries are timely according to established rules and regulations.	Prior to imple-mentation	X		X			
	Determine access needs for all functions and departments (paper study of retrieval)--terminal vs. printer		X	X	X	X	X	X
	Total terminals vs. printers		X				X	

	Scanners		X		X						
	Jukeboxes if used		X		X						
	Other equipment (previous fiche/ film)		X		X						
	Use of bar code scanners and labels?		X		X						
(a) Design new procedures for performing analysis online and for reporting and tracking deficiencies	If copies of dictated reports are filed in the record while the patient is being treated, decide how to handle handwritten changes; will an electronic signature be required if dictated reports are signed manually?	Prior to imple-mentation	X	X	X		X				
(b) Build tables; identify document types that will have deficiencies; create physician letters, notices.	Determine which deficiencies will be assigned automatically (i.e. signatures on dictated reports) and which will be assigned manually by HIM staff (i.e. signatures on scanned orders).	During system build phase of project	X	X	X		X				
(c) Develop written policy and procedure on electronic signatures	To ensure the accuracy and protect the integrity of electronic records and to safeguard against misuse of electronic signatures, review with your vendor how reports that need correction by the author are handled (i.e. does your system allow text editing?).	6 months prior to implementation	X	X							X
Paper storage/ filing	To determine disposition of paper documents after scanning	Prior to imple-mentation	X	X	X				Board approval of retention policy		X
(a) Check state and federal retention statutes to determine how long to retain paper documents.	Medicare Condi-tions of Participation §482.24 state "Medical Records must be retained in their original or legally reproduced form for a period of at least 5 years"	10 months before implementation	X	X	X		X				X
(b) Define where paper records will be storied and how long they will be maintained.	Considerations: on site vs. off site storage; method of storage (i.e. in boxes by scan date); will COLD fed docu-ments be printed and stored along with scanned docu-ments? will paper documents be secured for potential legal cases? how and when will documents be destroyed?	8 months before implementation									
(c) Develop an RFP and obtain bids if records will stored off site or	Once vendor is selected, a contract and business asso-ciate agreement will need to be signed.	8 months be-fore implemen-tation	X						Purchasing		X

destroyed by an outside vendor							
(d) Define method to locate stored paper documents	Creating standard batch names and using subtitle fields can assist in locating scanned records. Example: include the date scanned, record type and medical record number in the batch name for inpatients.	Prior to imple-mentation	X			X	
Communications	To assure that all stakeholders receive critical information about the new system and the impact	Several months prior to live date	X				Marketing and communications department
(a) Identify key stakeholders and end users	Medical staff, nursing staff; other departments, admin-istration, quality management staff, external reviewers.	Several months prior to live date	X	X	X		
(b) Develop com-munication plans	Include how information will be communicated (Web sites, posters, mailings), when, what information should be communicated (i.e. live dates, training information, key contacts, system features)	Several months prior to live date	X	X	X		
(c) Execute plan, design and create communication tools		Several months prior to live date	X	X	X		
QA	After documents are scanned the next steps are indexing and quality control. Indexing is performed to assign document names and encounter numbers to each document. Quality control is performed on 100% of images to review the quality of scanned images. In addition to this initial quality control it is recommended that ongoing quality monitoring be performed on a random basis.						
(a) Develop index-ing competency checklist and vali-dation tools to as-sess performance of staff assigned to indexing.	Consider performing a second quality review of all documents indexed by new staff until desired levels of competency are achieved	Few months before live date	X			X	
(b) Develop ongoing QA Plan	Perform on a random sample of images to measure accuracy rate of indexing.	Shortly after live date	X			X	Quality management

(c) Determine sample size and method and frequency of review.		Shortly after live date	X				X
(d) Develop quality indicators and thresholds.	Documents indexed to correct document name? Documents indexed to correct patient? Documents indexed to correct encounter? Documents indexed in chronological order? Documents contain no folded edges?	Shortly after live date	X				X
(e) Design tools for data review and display.		Shortly after live date	X				X
(f) Assign respon-sibility for data collection, tabulation, follow-up.		Shortly after live date	X				X
Policies and Procedures Develop new policies and procedures.		6 months before live date and prior to training	X				X
1. Discharged chart check-in and reconciliation	To assure records are received in the HIM Department as soon as possible after discharge		X		X		X
2. Prepping			X				X
3. Document cap-ture (scanning, re-scanning, indexing, quality control)	Create batch cover sheets.		X				X
4. Online coding							
5. Release of information (printing, faxing)			X				X
6. External audits	How will auditors access online chart?		X				X
7. Scanner maintenance	Be sure that all required supplies (light bulbs, cleaning products) are ordered		X				X
8. Deficiency analysis			X	X			X
9. Delinquent record reporting				X			X
10. Correction of reports			X	X			X
11. Downtime procedures			X			X	X
12. Procedures to request access to imaged chart	Consider using an online request form. Requests should be from manager or above.		X	X	X	X	X
13. Requests for old charts			X	X	X		X
14. Use of place-holders (pictures and photos)			X				X
15. Workflow queue monitoring	If an automated workflow is part of the document imag-ing system, work queues will need to be		X			X	X

	monitored to assure assignments are processing correctly.															
Legal considera-tions--The informa-tion stored is the entity's business record and in healthcare the legal record. The plan to house this informa-tion on media other than paper must be scrutinized by a legal counsel acting on its behalf to ensure that the technology being considered can comply with federal and state laws, requirements for licensure and credentialing, along with operational needs and policies and procedures. Tucked under this section is a risk management com-ponent which will need to ensure that there will be no compromise to patient care and that documents required for law-suits remain avail-able. This may impact a facility's decision on how to proceed with their documents once scanned into the imaging system.	(a) Identify the system being used is acceptable with any federal/state laws along with other requirements from regulatory agencies.	Prior to choosing a system	X	X	X						X		X		
	(b) Ensure media that will house information can meet retention periods.	Prior to choosing a system.	X		X		X					X		X		
	(c) Assess system in order to demonstrate that archived information is secure and retains an integrity in regards to tampering.	Prior to choosing a system.	X		X		X					X		X		
	(d) Ensure that system provides timely access to support patient care and administrative needs.	Prior to choosing a system	X	X	X	X	X		X	X		X		X	X	
	(e) Identify policy for retention of paper documents.	Prior to live date	X	X	X	X	X		X	X		X		X		
	(f) Identify backup and downtime procedures.	Prior to live date	X	X	X	X	X	X	X	X			X			
	(g) Identify definition of legal medical record.	At the time of live date or soon after	X	X	X								X			
	(h) Review contractual obligations with vendors (1) to determine that they are adequate to support system implementation, transition and maintenance, and (2) ensure that the vendor's contract includes your HIPAA compliant requirements and that the system provides features that allow you to be compliant with the privacy & security regulations.	Once a vendor is selected	X										X			
	(i) Develop criteria for audits along with policy & procedures for disciplinary action for inappropriate access and disclosure.	prior to live date		X	X	X							X	X		
Interface or scanned-indexing: integra-tion--Document imaging is only one component of an electronic doc-ument manage-ment system. It is the means by which you can introduce docu-ments created on paper	(a) Identify all forms. An inventory of the forms that comprise your chart is neces-sary and a decision to standardize those which will be incor-porated into the document imaging system. The inventory will allow the facility to make decisions regarding the level of detail they	6 months to a year prior to live date	X		X	X	X					X		X		

into a digi-tal system. Approach to this should include the assumption that having the information integrated in a way that provides easy access and retrieval similar to the experience of the paper based chart is important. What needs to be resolved is what information resides on other systems and what they can import. There are many technical and proprietary issues surrounding how this can be accomplished.	wish to index to. Bar codes can be applied to approved forms to identify document types and decrease some of the steps in the indexing function. The advantage is that the more speci-fic indexing allows for easier navigation although the burden then increases that activity in the front end. This is ultimately a decision that should be con-sidered by your user groups													
	(b) Inventory the current disparate systems that main-tain electronically generated information. (1) How are those reports currently maintained (online and/or printed for inclusion in the paper chart)? (2) Are those systems capable of COLD feeding into the document imaging system? Volume of the data and format (ASCII or txt) is important. (3) Identify the vendors of those other systems and query their protocol for establishing inter-faces with systems other than their own. (4) Have vendors of other sys-tems provide you with a contact who will work with your facility to establish these feeds. (5) Establish a team of IT staff to be dedicated to this project and who will provide support and moni-toring after these interfaces are in place.	Prior to select-ing a vendor	X		X	X	X				X			X	
Coding Process Re-engineer work flow to ensure that coders will have access to information in a timely manner to enhance and not compromise revenue.	(a) Verify the turn-around time from when documents are scanned, indexed, released, and then made available to the user.	At the time the system is being assessed and when it is being tested just prior to and post live date.	X		X	X	X				X			X	
	(b) Verify speed of the system from a viewing perspective.	At the time the system is being assessed and when it is being tested just prior to and post live date.	X			X	X			X	X				
	(c) Consider the size of the monitors needed to review records online.	6 months to a year prior to live date (as you may require capital funding)	X	X	X	X	X			X	X			X	
	(d) Make strategic decisions regarding system time outs based on role based access.	Prior to live date	X	X	X	X	X	X	X		X			X	X

	(e) Ensure initial training is conducted and there is a way to provide some follow-up by a super user to include tips and tricks in navigating the system.	1-2 months post live date	X	X	X	X	X	X	X		X		X	X	X	
	(f) Consider the physical environmental issues including ergonomics/lighting.	6 months prior to live date	X	X	X	X	X	X	X	X			X	X	X	
	(g) Review system capabilities and policies to enable telecommuting.	Prior to and post live date	X	X					X		X		X	X	X	
Access (online and printing) chart tracking process --The ability to provide concurrent access to information is key to the EHR. In creating greater access you need to be strategic in deciding where to allow printing and what kind (network or local or screen print).	(a) Determine who needs access, for what purpose and where. (1) This is critical in making hardware decisions as to how many workstations need to be rolled out. (2) Opportunity to analyze your users in terms of role based classes so that you can understand what types of access levels you want to assign. (3) Transition plan to phase out distribution of hard copy chart. (4) Roll out strategy timed to create a meaningful database for each clinical area (consider back scanning specific segment of records). (5) Have a strategy for handling duplicate docu-ments that may make their way into the imaged record. (6) Determine appropriate time outs for specific areas.	6 months - 1 year prior to live date	X	X	X	X	X	X	X	X	X		X	X		
	(b) Making decisions in regards to printing is key since you want to ensure your document man-agement system is not producing any unncessary production and proliferation of paper documents. (1) Only allow printing for release of information and train users to only print what they need. (2) Ensure that shared printers are in secure locations and have a banner page which identifies which user is printing, how many pages the job will print, and a confidentiality statement. (3) Enable local or screen print to satisfy clinician's need to review a specific report. (4) Implement a policy and procedure for managing documents that are	Prior to and shortly post live date	X	X	X	X	X	X	X		X		X		X	

	printed throughout the orgnanization which should include ability to securely destroy and filter out from original documents routed to HIM for scanning/ indexing. (5) Reassess how much paper and toner you may need to order and keep on hand. (6) Find out if users who need to print to shared printers can have a program installed which would show how many jobs may already be in a work que prior to sending work to that specific printer. (7) See if a specific printer can be reserved for more emergent type of print jobs. (8) Ensure IT is able to provide timely sup-port to the printing function which should include timely ability to cancel print jobs. (9) Can the system print in a precise fashion, i.e. ability to break up a document type to only print specific pages or does force you to print more than you want? and if it is precise are your users trained to only print what is necessary? (10) Get buy in from organization that users will accss information online and that the HIM Department does not become a printing factory for areas who do not wish to access the system.															
	(c) Establish time out protocols	prior to live date	X		X	X&	X	X	X		X		X		X	
	(d) Decide when to stop circulating paper based chart.	post live date	X	X	X	X	X	X	X		X		X		X	
Job Descriptions With new opera-tions come new job descriptions which require different kinds of skill sets. As HIM Departments change the way they conduct business from managing charts to online information the staffing complement may be reduced and the individuals will be charged with a more diverse and techni-cally	(a) create a flow chart to identify functions which need to occur operationally to support document imaging. (1) Try to transition units which have supported similar types of functionality in the manual world. (2) Work with the current job descriptions and incorporate new skill sets and competencies which would be required for newly created positions. (3) Determine that grades and levels are appropriate for new functionalities. (4) Work closely with Legal Affairs and HR to	6-9 months prior to live date	X	X			X	X	X	X	X	X	X	X	X	

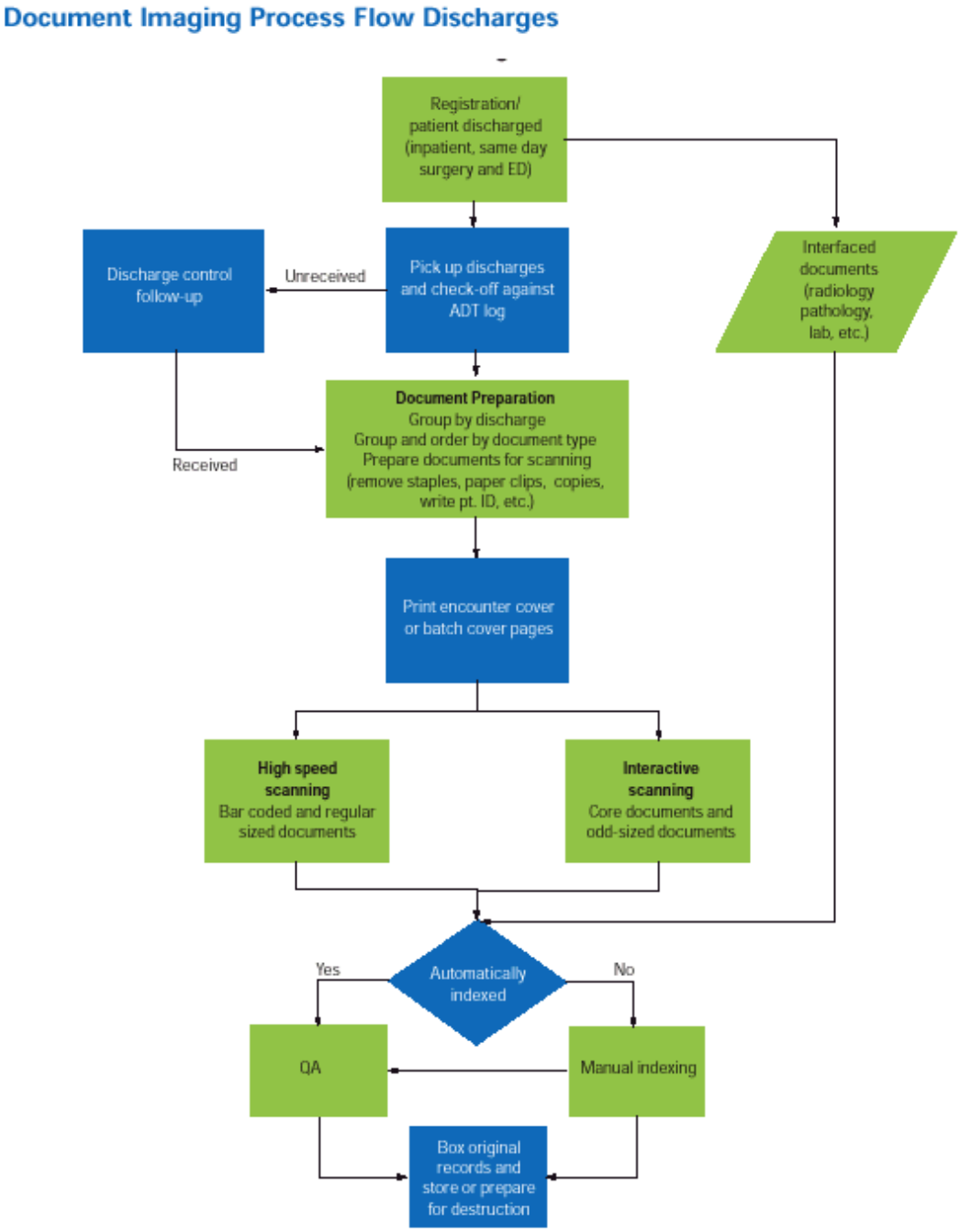
challenged approach in how they perform their jobs. Developing computer skills for existing staff and requiring a stand-ard for new recruits becomes essential.	ensure that you are not creating employee relations or union problems by changing job descriptions for current employees. (5) Ensure that your recruiters can develop appropriate skills assesments to identify individuals who are comfortable working with computers for new hires (6) Involve facility's organizational learning center in a viable training plan. (7) Involve the managers and supervisors in the plans to transition jobs and have this effectively communicated to staff to allay fears of being phased out. (8) Con-sider outsourcing operations which may in time diminish such as the chart assembly function.															
Training plan for the system: With-out training the system will never live and breathe. There is a hierarchy in who needs to be trained, by whom on what and where. The range is from staff who will support the system from an IT perspective to the areas who will assume the scanning/indexing operation to users who will need to access the infor-mation by time you go live. The timing needs to be strategic on all levels to ensure that as the go live date approaches you do not have to repeat training due to non-use of the system. There may exist a more basic training prior to system training on the part of those who will be scanning and indexing and the general users of the system which is do they need to learn how to operate a PC?	(a) Identify the roles and class of staff who need to be trained in order to work closely with the vendor to phase this in appropriately. (1) IT Training: consider whether the staff who will support the system need to be trained at the vendor's site. (2) Identify who will be training the organization's users and ensure that they recieve adequate training from vendor along with working with HIM and other clinical departments to appropriately guide users to navigate through the documents (3) Plan what type of training room you may want to set up with regard to how many users should be in one class and as-sign the appropriate workstations to this area. Ensure that there is an assur-ance from IT that this room will be routinely checked to ensure that the system will be available when a session is conducted. (4) Work with technical teams to coordinate training with hardware and software roll-outs. (5) Involve clinical coordinators in scheduling user training for physi-cians and nursing staff. (6)	For IT staff, 3 - 6 months prior to live date For trainers, 1 month prior to live date For scanning and indexing operations, 1 month prior to live date For users, within 1 month prior to live date For users who require basic pc training this should be happening within the year prior to live date in order to build a comfort level with these skills.	X	X	X	X	X	X	X	X	X	X	X	X	X

	Identify superusers in each area to serve as reference to others. (7) Consider printing up cheat sheets for users to have handy when working with the system. (8) Educate users on how to call for help when having system problems.

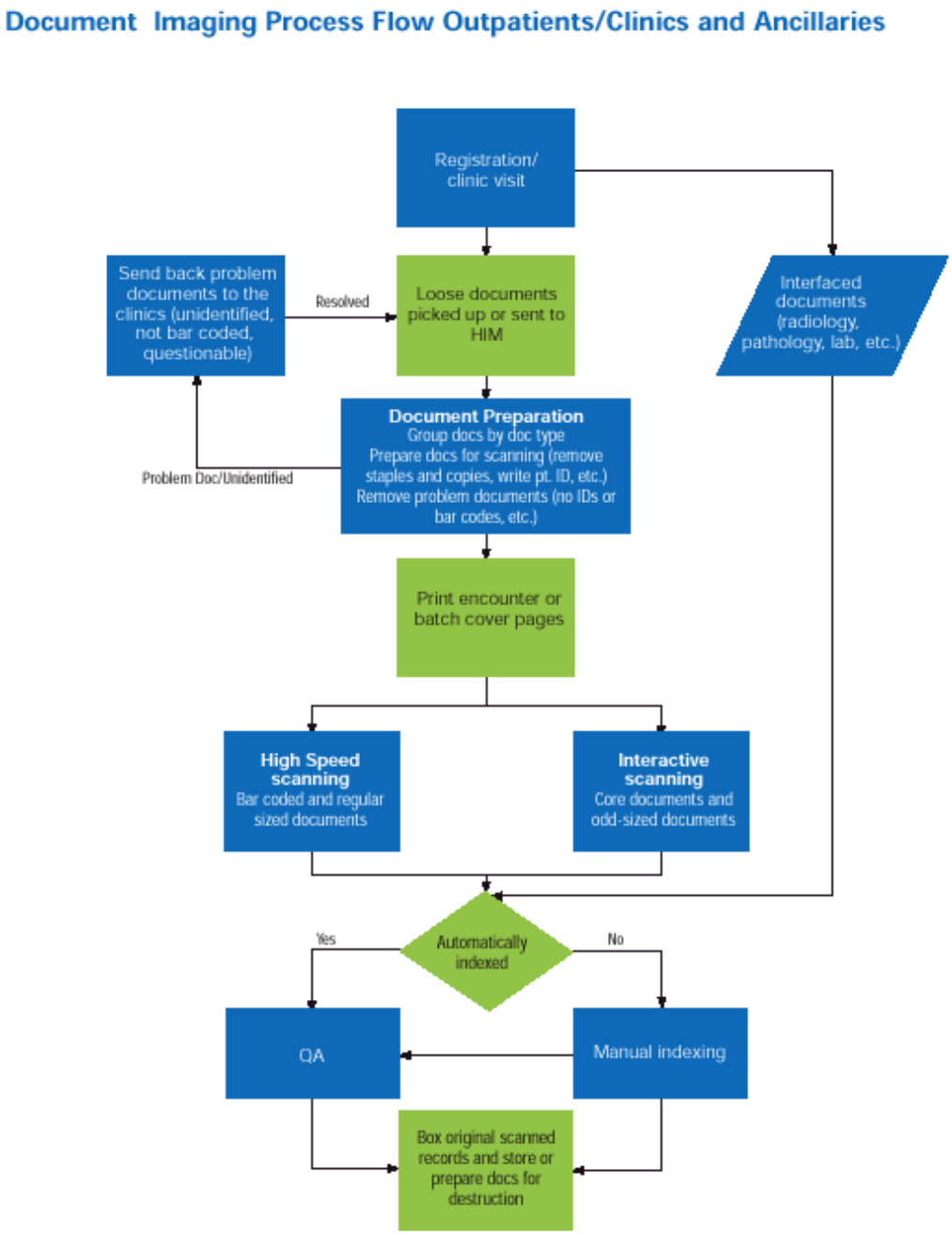
Appendix G: Project Plan Processes

1. Initiating processes (authorizing the project)
    a. Contract execution
    b. Acquisition
2. Planning processes (defining objectives and the course of action to attain the objectives required of the project)
    a. Defining and documenting the scope of the project
    b. Developing the project plan
    c. Assigning the project team
3. Executing process (carrying out the project plan)
    a. Training
    b. Data collection
    c. Work flow analysis
    d. Hardware installation
    e. Software installation
    f. System configuration
    g. Testing
    h. Activation preparation
    i. Activation
4. Controlling process (monitoring and measuring progress to identify variances from the plan)
    a. Quality reviews
    b. Status meetings
    c. Overhead activities (reporting)
5. Closing process (formalizing acceptance of the project and bringing it to an end)
    a. Transition to support organization
    b. Project closure

Appendix H

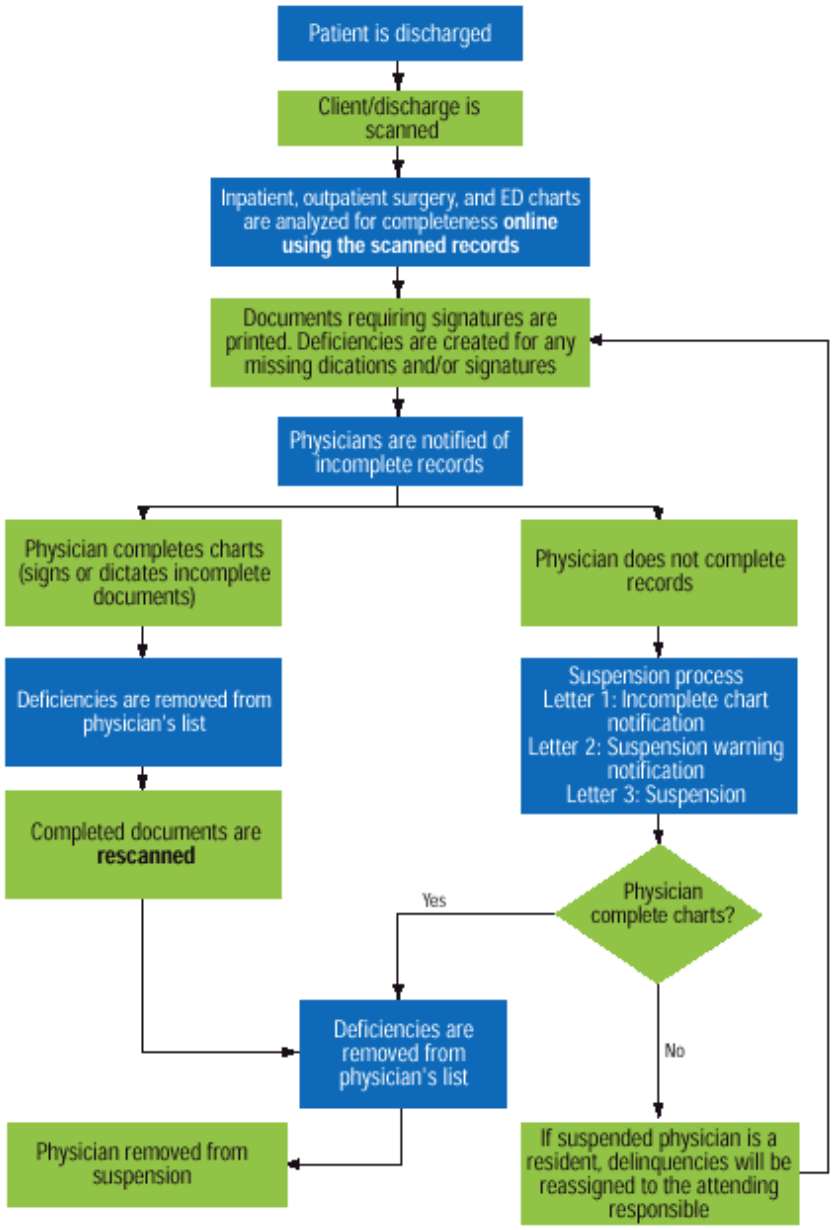

Document Imaging Process Flow Discharges
Registration/ patient discharged (inpatient, same day surgery and ED)
Discharge control follow-up
Unreceived
Pick up discharges and check-off against ADT log
Interfaced documents (radiology pathology, lab, etc.)
Received
Document Preparation
Group by discharge
Group and order by document type
Prepare documents for scanning
(remove staples, paper clips, copies, write pt. ID, etc.)
Print encounter cover or batch cover pages
High speed scanning
Bar coded and regular sized documents
Interactive scanning
Core documents and odd-sized documents
Yes
Automatically indexed
No
QA
Manual indexing
Box original records and store or prepare for destruction

Appendix I


Document Imaging Process Flow Outpatients/Clinics and Ancillaries
Registration/ clinic visit
Send back problem documents to the clinics (unidentified, not bar coded, questionable)
Resolved
Loose documents picked up or sent to HIM
Interfaced documents (radiology, pathology, lab, etc.)
Problem Doc/Unidentified
Document Preparation
Group docs by doc type
Prepare docs for scanning (remove staples and copies, write pt. ID, etc.)
Remove problem documents (no IDs or bar codes, etc.)
Print encounter or batch cover pages
High Speed scanning
Bar coded and regular sized documents
Interactive scanning
Core documents and odd-sized documents
Yes
Automatically indexed
No
QA
Manual indexing
Box original scanned records and store or prepare docs for destruction

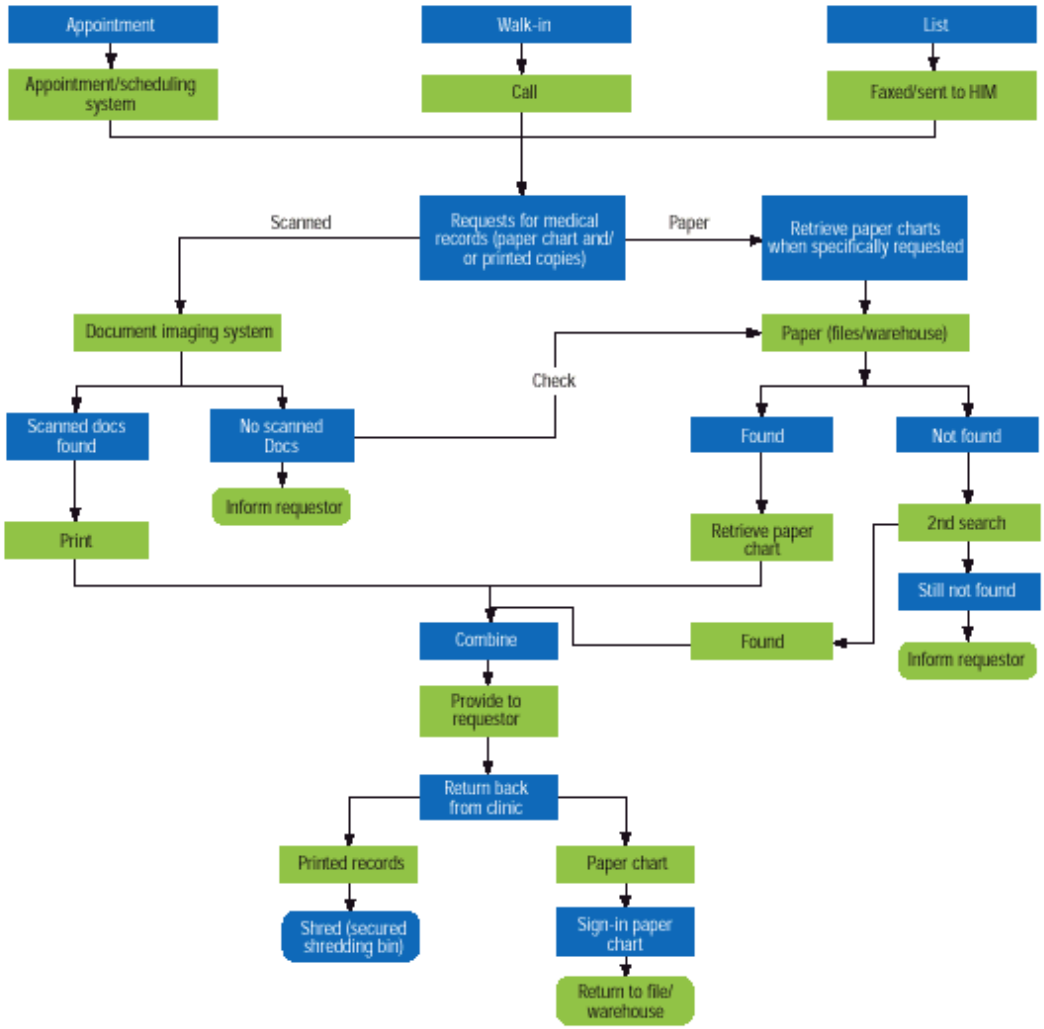
Appendix J

Chart Completion Work Flow



Appendix K

Medical Records Retrieval Process



Appendix L

Position Summary: Indexing

Intermediate-Level Position

Manually indexes documents to the correct level as established by facility policy. Minimizes duplicate records and overlap entries. Verifies data integrity. Coordinates information with master patient index and patient registration modules, and various other ancillary departments and modules.

Education

- High school graduate or equivalent with GED
- Associate degree: RHIT Preferred

Experience

- Minimum of 3 years HIM experience (mandatory) or associate degree: RHIT
- Good oral and written communication skills
- Basic computer skills

Required Skills

- Knowledge of medical record format and content for all patient records
- Competent knowledge and understanding of anatomy
- Competent knowledge of medical terminology
- Ability to review record and verify patient identification
- Strong computer skills
- Good verbal, written and computer communication skills
- Ability to perform job function and make decisions without direct supervision
- Detail oriented
- Ability to evaluate and process _____ (encounters, sections or documents) per hour
- Ability to interact with customers

Core Competencies

1. Monitor the manual indexing queue of unassigned images.
2. Prioritize the batches in the queue and retrieve the batches for processing.
3. Confirm that all records ready for indexing have been received.
4. Review each electronic image within the batch. Compare with hard copy to confirm image quality, appropriate order and appropriate rotation.
5. Determine the correct patient name, medical record number, account number, document type, or section (if appropriate).
6. Index the image (encounter, section, or document) appropriately by required patient data elements according to facility specific guidelines.
7. Review and determine if image should be

    a. Added as a new document to an existing record
    b. Replacing a page within an existing record
    c. Deleted

8. Delete episodes when determined applicable.
9. Add episodes when determined appropriate.
10. Revise episodes when determined appropriate.
11. Relocate episode when determined appropriate.
12. Return for re-scan any images not appropriate for permanent storage.

Appendix M

Position Summary: Preparation

Entry-Level Position

Prepares documents for scanning into the electronic document management system. Examines pages and verifies patient identification on each page.

Education

High school graduate or equivalent with GED

Experience

- Experience in health information management department preferred

- Good oral communication skills
- Basic computer skills preferred

Required Skills

- Knowledge of medical record format and content for all visit types
- Ability to examine the record and verify patient identification
- Ability to examine a form and determine its proper placement within the record
- Ability to identify nonstandard forms and determine action required
- Ability to navigate the patient registration system
- Ability to push or lift up to 30 pounds
- Detail oriented
- Ability to evaluate and process _____ documents per hour

Core Competencies

1. Reconcile paper records with departmental documents to verify receipt of all records.
2. Confirm patient name, medical record number, and account number on every page in the record, front and back.
3. Identify and tape any torn edges.
4. Mount and tape down any sheets less than 8.5 by 11 inches on an 8.5-by-11-inch sheet.
5. For sheets with rhythm strips or other mounted documents, tape down the top of the strip so it does not catch in the automatic document feeder (if you will be scanning in "Portrait" mode).
6. Remove all staples.
7. Perforate and number pages for fan-folded sheets.
8. Put tape over sticky materials.
9. For any documents on card stock or manila, such as Kardex or ambulance run sheets, make a photocopy before scanning.
10. Arrange multipage documents in date order, either chronological or reverse chronological, per department guidelines.
11. Ensure all pages are in the same proper orientation.
12. If a document is identified as likely to result in poor image quality once scanned, photocopy the document, adjusting the copy contrast (lightness/darkness). This may help improve the quality of the scanned image. If improvement is not noted, follow departmental guidelines for processing poor-quality originals.
13. Once all documents are prepped for scanning, clip them together and place them at the front of the folder. Set them aside until you are ready to deliver them to the scanning staff. Segregation of these documents in the folder allows all of the record to stay together (i. e. in the patient folder), and the scanning staff can select only the part of the record that is to be scanned.

Appendix N

Position Summary: Quality Control

Intermediate-Level Position

Reviews the electronic document management system and records contained within for appropriate image quality and indexing.

Education

- High school graduate or equivalent with GED
- Associate degree: RHIT preferred

Experience

- Good oral and written communication skills
- Basic computer skills

Required Skills

- Knowledge of medical record format and content for all patient records
- Competent knowledge and understanding of anatomy
- Competent knowledge of medical terminology
- Ability to review record and verify patient identification
- Strong computer skills
- Good verbal, written, and computer communication skills
- Ability to perform job function and make decisions without direct supervision
- Detail oriented
- Ability to evaluate and process _____ (encounters, sections or documents) per hour
- Ability to interact with customers

Core Competencies

1. Determine the readiness of the batch for the quality control process.
2. Locate the electronic document for verification against the paper batch.
3. Review each image in the batch and verify the following

    a. Correct patient name and account level
    b. Proper indexing level (encounter, section, or document)
    c. Image quality (readable, orientation, multiple sides, etc.)

4. For each page scanned or indexed with errors

    a. Rearrange out of order images within the electronic document.
    b. Relocate electronic images that are incorrectly filed in another document.
    c. Relocate electronic images or documents that are incorrectly filed in an encounter.
    d. Replace electronic images that have unacceptable image quality or have been updated.
    e. Modify the indexing as appropriate.

Appendix O

Position Summary: Scanning

Entry-Level Position

Scans documents into the electronic document management system. Examines pages and verifies patient identification on each page. Appropriately batches documents. Maintains scanning equipment.

Education

- High school graduate or equivalent with GED

Experience

- Experience in health information management department preferred
- Good oral communication skills
- Basic computer skills preferred

Required Skills

- Ability to perform routine maintenance and adjust setting on the scanning equipment

- Ability to examine record and verify patient identification
- Ability to identify forms, standard and nonstandard, and their appropriateness for inclusion in the record
- Ability to perform computer functions
- Good eye and hand coordination
- Ability to push or lift 30 pounds
- Good verbal communication skills
- Detail oriented
- Ability to evaluate and process _____ documents per hour

Core Competencies

1. Perform daily maintenance of the scanner
2. Calibrate the scanner for proper image quality
3. "Fan" the stack of documents to be scanned in order to make sure the documents separate easily and that any previous hole punches or stapled pages do not stick together. Purpose: Reduce the number of automatic document feeder misfeeds.
4. Once records are scanned, remove them from the scanner's out tray. Begin process of verifying the quality and accuracy of the scans. With the records faceup, view the hard copy and the scanned image to confirm all images can be read and all pages were captured. This can be done by flipping through the hard copies as you verify each image, page by page. Purpose: Reduce the number of rescans as a result of poor image quality or skipped pages.
5. As images are reviewed, change the rotation, switch sides, etc., as needed. For example, documents that are typically viewed "landscape" should be rotated so they present to the end user in landscape mode. If a docu-ment was sent through the scanner so that the back page was scanned as the front page, switch sides to put the images in the appropriate order. Purpose: Improve the readability and use of the images by the end user.
6. If an image is identified to be of poor quality, adjust the scan sensitivity or use the copy machine to enhance the quality of the document to be scanned. Once the scan sensitivity is changed or the document is enhanced via the copy machine, replace the image. Purpose: Reduce the number of records returned for rescan as a result of poor image quality.
7. Once initial quality review has been completed, transfer the folder to Assign Document ID. Clip or bundle the hard-copy pages together and forward them for document ID assignment. Purpose: The process of document ID assignment will provide a second review to identify issues with image quality or skipped pages. The hard-copy record must be available in order to accomplish this.

Appendix P

Sample Course Plan

Title class:	Executive Overview--Introduction to Electradoc (EDMS vendor name)
Description:	Executive overview of Electradoc outlines how Electradoc will support the delivery of improved patient care, customer service, reduce cost and speed up patient billing for CareAll Health System.
Target audience:	Senior management/ leadership, possibly middle management
Training setting:	Classroom (if available, a room that is utilized for executive meetings) Provide continental breakfast
Duration:	Thirty to 60 minutes (max) for lecture and demonstration
Schedule:	9 a. m.
Method of evaluation:	Assessment/ evaluation tool given after the class
Training aids:	Laptop/ projector Handouts--quick reference guide, fact sheet
Prerequisites:	None

Electradoc Training Schedule

Class	Curriculum	# of attendees	Start Date	End Date
Executive Overview	**Goals** Outlines how Electradoc will support the delivery of improved patient care, customer service, reduce cost and speed up patient billing for CareAll Health System	8	3/26	3/29
Foundation Patient Accounting (first class)	**Goals** Outlines the basic elements for understanding the Patient Accounting Specifics	6	5/4	5/7
Foundation Patient Accounting (second class)	Same as above	6	5/11	5/14
Foundation Registration (2 consecutive sessions)	**Goals** • Demonstrate to user how to configure Patient Registration Application • Prepares user to train other end users **Key Topics** Registration assistant work flow issues, document types, and chart order issues	4	5/25	5/28
System Administration	**Key Topics** Care and feeding of Electradoc server and jukebox, intro to interface monitoring, Electradoc menu, logs, and monitoring	4	5/25	5/28
HIM Foundation (first class)	**Goals** Demonstrate to user how to configure chart completion work flow and prepares user to train other end users **Key Topics** Defining and configuring a basic chart completion work flow process, deficiency analysis, chart completion, release of information, reports	6	6/13	6/16
HIM Foundation (second class)	Same as above	6	6/20	6/23
HIM Scanning (first class)	**Goals** • Outline basic elements for understanding the scanning configuration • Prepare user to develop scanning processes and procedures • To configure scan operator with site defined batches • Prepare user to train your scanning and quality review team(s) **Key Topics** Practice scanning, reviewing, accepting, and uploading charts; practice routine maintenance of various scanner models; how to generate reports	4	6/27	6/30

HIM Scanning (second class)	Same as above	4	7/5	7/8

Appendix Q: Benchmark Productivity Standards

Positions	Inpatient Records WO/Bar Codes	Inpatient Pages/Sheets W/Bar Codes	Inpatient Pages/Sheets W/Bar Codes	Inpatient WO/Bar Codes	SDS Records WO/Bar Codes	SDS Records W/Bar Codes
Chart assembly and preparation		20 per hour	200 per hour			
Batch scanning				50 per hour		
Flatbed scanning						
Scanning and prepping			594 per hour			
Scanning and indexing	30 per hour	40 per hour				
Scanning, prepping, and indexing		20 per hour				
Indexing only			107 per hour			
Quality control	100%	100%	100%	100%	100%	100%
Document maintenance						
Coding inpatient	2.4 to 4 per hour					
Coding outpatient						12 to 20 per hour
Audits (monthly on each employee [if new employee 100% and decrease percentage based on error rate])	10%	10%	10%	10%	10%	10%

Positions	SDS Pages/Sheets W/Bar Codes	SDS Pages/Sheets WO/Bar Codes	ED Records WO/Bar Codes	ED Records W/Bar Codes	ED Pages/Sheets W/Bar Codes	ED Pages/Sheets WO/Bar Codes
Chart assembly and preparation	200 per hour				200 per hour	
Batch scanning		50 per hour	87 per hour			50 per hour
Flatbed scanning						
Scanning and prepping	123 per hour				123 per hour	
Scanning and indexing			90 per hour			
Scanning, prepping, and indexing						
Indexing only	100%	100%	100%	100%	100%	100%
Quality control						
Document maintenance						
Coding inpatient			11 per hour	12-20 hour		
Coding outpatient						
Audits (monthly on each employee [if new employee 100% and decrease percentage based on error rate])	10%	10%	10%	10%	10%	10%

Positions	Clinic Diagnostics Records WO/Bar Codes	Clinic Diagnostics Records W/Bar Codes	Clinic Diagnostics Pages/Sheets W/Bar Codes	Clinic Diagnostics Pages/Sheets WO/Bar Codes

Chart assembly and preparation			200 per hour	
Batch scanning				50 per hour
Flatbed scanning				
Scanning and prepping			190 per hour	
Scanning and indexing				
Scanning, prepping, and indexing			143 per hour	
Indexing only	100%	100%	100%	100%
Quality control				
Document maintenance				
Coding inpatient				
Coding outpatient	18 to 20 per hour	40 to 60 per hour		
Audits (monthly on each employee [if new employee 100% and decrease percentage based on error rate])	10%	10%	10%	10%

Prepared by

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