Jenzabar CX

Document Imaging

Installation Guide
# TABLE OF CONTENTS

## SECTION 1 - GETTING STARTED
- Overview ................................................................................................................................... 1
  - Introduction ............................................................................................................................... 1
  - Purpose of This Guide ............................................................................................................... 1
  - Intended Audience .................................................................................................................... 1
  - About the User Version ............................................................................................................. 1
  - Process of Installation ............................................................................................................... 1
- Product Design ............................................................................................................................ 2
  - Introduction ............................................................................................................................... 2
  - Document Files ........................................................................................................................ 2
  - Volumes .................................................................................................................................... 2
  - Servers ...................................................................................................................................... 2
  - Image Systems .......................................................................................................................... 2
- Hardware/Software Requirements ................................................................................................. 4
  - Introduction ............................................................................................................................... 4
  - Viewing Stations ......................................................................................................................... 4
  - Scanning Stations ....................................................................................................................... 4
  - Monitor Sizes ............................................................................................................................ 5
  - Database Connectivity ............................................................................................................... 5
  - Image Server ............................................................................................................................. 5

## SECTION 2 - TABLE SETUP
- Overview ..................................................................................................................................... 7
  - Introduction ............................................................................................................................... 7
  - Standard CX Records ............................................................................................................... 7
  - Institution-Specific Records ..................................................................................................... 7
  - Image System Administration Tables/Records ......................................................................... 7
  - Document Type Tables ............................................................................................................. 8
- Building the Primary Tables ......................................................................................................... 9
  - Introduction ............................................................................................................................... 9
  - Access ..................................................................................................................................... 9
  - Image Server Table (im_server_table) ..................................................................................... 9
  - Image System Table (im_sys_table) ........................................................................................ 10
  - Image Volume Table (im_vol_table) ......................................................................................... 11
  - Image Volume Record (im_vol_rec) ........................................................................................ 11
  - Estimating the Number of Subvolumes .................................................................................... 12
  - Image Files Storage Location .................................................................................................... 13
  - Allocation and Preallocation Amounts ..................................................................................... 13
  - Over-Subscribing Volumes ........................................................................................................ 13

## SECTION 3 - PC INSTALLATION
- Overview .................................................................................................................................... 15
  - Introduction ............................................................................................................................... 15
  - Tasks Prior to Installation ........................................................................................................ 15
  - Canceling the Installation .......................................................................................................... 15
  - Installing Document Imaging on a PC ...................................................................................... 17
    - How to Install on a PC ........................................................................................................... 17

## PROGRAMS
- Overview ................................................................................................................................... 21
SECTION 1 - GETTING STARTED

Overview

Introduction

Document Imaging is a document scanning and viewing product that Jenzabar, Inc. has developed for the CX product.

Purpose of This Guide

This guide serves as a learning tool and reference guide for installing the Document Imaging product. The information in this guide can help you install the Document Imaging files on a personal computer (PC) and set up the tables on the host system containing the CX product.

Intended Audience

This guide is for use by the system users in your institution's computing center. System users include the Jenzabar system coordinator, system administrator, and programmer/analyst.

About the User Version

Document Imaging currently has a user version, which has options for scanning and viewing document images. To access the tables discussed in this guide, you must use the Table Maintenance option, which is not a standard part of the user version. If a user is to have access to Table Maintenance, a shortcut on the user's desktop should be created to imagetbl2.exe in the Document Imaging directory.

Process of Installation

The following steps describe the process for installing Document Imaging:

1. The institution obtains or upgrades the hardware required to run the Document Imaging System, including viewing stations, scanning stations, and, if desired, a server.
2. The institution installs the Document Imaging host software and builds the tables on the host computer.
3. The institution installs the Document Imaging software on each of the user's workstations.
4. The institution builds the table entries to create the desired behavior for Document Imaging.
Product Design

Introduction

Document Imaging is designed to store:

- Index information in the CX database
- Document image files as files in volumes located in the file system on one or more image servers

The following describes the hierarchy of concepts of Document Imaging.

Document Files

The lowest level concept is the page image, the scanned file for a single page. This file is in *tif* format for bi-tonal documents (gray scale) and *jpg* format for color images. It exists only during the actual scan or display of a document. During a scan operation, the system compresses one or more of the page images and places them in a temporary directory. When the user saves the document, all images and associated files are copied into a container file called the *document file*. The system also stores header information, a directory of the document file, and a copy of the information in the Index record (im_doc_rec) in the document file. For compound documents, the product stores all parts of a document (including overlays when they are supported) in one operating system file.

Volumes

Document files reside on a *volume*, which is tied only temporarily to a specific physical device, such as a hard drive, optical disk, or CD-ROM, through an entry in the Volume record (im_vol_rec). Because a volume is not permanently tied to a physical device, you can move a volume from one physical device to another without having to modify either the Index record or the indexing information in a document file. This is important because the copy of the Index record embedded in the document file contains the volume number. If you plan to migrate documents to CD-ROM physical volumes, you can allocate spaces on the drives (optical or hard drive) to be approximately the size of a CD-ROM. Thus, when you move documents from the hard drive to the CD-ROM, you update only one record, the Image Volume record (im_vol_rec). This record has a server code in it that points to a Server record, which contains the path to the server. The image tables will continue to point to the correct volume number, but the volume will be on a physically (or at least logically) distinct server.

Servers

Volumes reside on a *server*. A server can be a hard drive with room for one or several volumes or a jukebox with provision for many volumes. Jenzabar, Inc. recommends that during a volume’s early life the volume reside on a hard drive or a fast optical drive server. As access to a volume tapers off, you may then migrate the volume to a more cost effective media, such as a CD-ROM, which can be mounted in a jukebox for convenient access. In the future, the CD-ROM will be able to be taken offline, in which case a message will appear to prompt the user to mount it in a drive.

Image Systems

Servers reside in one or more *image systems*. The concept of the image system simplifies the handling of document files and permissions. An image system can exist entirely on a single user’s system. For instance, to provide a high level of security, a user dealing with highly confidential information and correspondence can have an entire image system, complete with a workstation, scanner, and server, contained in the user’s office.
An image system can also serve a workgroup, such as the Admissions or Financial Aid office. In this case, the image system may contain one or more servers. Because the primary keys for most of the tables contain the image system code, different offices may define records with the same value. For example, each office could use the code GENLET (general letter) for a document type and for each office that code could have different properties. An institution can also store all documents on a common server, where the same server exists in each image system. In this scenario, the system places the documents for all workgroups in one location. However, most clients will choose to keep the documents for each workgroup on a separate server (for example, in a separate directory tree on a network file server).
Hardware/Software Requirements

Introduction
Your institution must consider the following in regard to hardware:
- Viewing stations
- Scanning station(s)
- Server (for document files)

Viewing Stations
An IBM-compatible PC with the following processor specifications:
- **Minimum**: Pentium 120 MHz or greater
- **Recommended**: Pentium 300 MHz or greater

Memory
The Random Access Memory (RAM) configuration for the PC is:
- **Minimum**: 64 megabytes (MB)
- **Recommended**: 128 MB or greater

Hard Disk Storage Requirements (for client machine)
- **Minimum**: 100 MB
- **Recommended**: 300 MB

Hard Disk Storage Requirements (for file server)
- **Minimum**: 100KB per page times the number of pages expected to be scanned during the period of interest

Software Requirements
- **Minimum**: Microsoft Windows 98 operating system
- **Recommended**: Microsoft Windows NT 4.0 with Service Pack 4 for non-USB scanners
- **Recommended**: Microsoft Windows 2000 or Microsoft Windows 98 for USB scanners

Graphics Card
- **Recommended**: A high-color graphics card in order to handle photographs

Scanning Stations
An IBM-compatible PC with the following processor specifications:
- **Minimum**: Pentium 120 MHz or greater
- **Recommended**: Pentium 300 MHz or greater

Memory
The following Random Access Memory (RAM) configuration for the PC is:
- **Minimum**: 128 MB
- **Recommended**: 256 MB or greater
Hard disk Storage Requirements

**Minimum:** 250 MB or greater of free disk space

**Recommended:** 1 gigabyte (GB) or greater of free disk space

**Scanner**

The scanner must be fully TWAIN compliant. In particular, the scanner must obey the command not to display its own GUI interface.

**Note:** Many scanners claim to be TWAIN compliant. Check with Jenzabar, Inc. or get one on approval.

Software Requirements

**Minimum:** Microsoft Windows 98 Operating System

**Recommended:** Microsoft Windows NT 4.0 with Service Pack 4 for non-USB scanners

**Recommended:** Microsoft Windows 2000 or Microsoft Windows 98 for USB scanners

**Graphics Card**

**Recommended:** A high-color graphics card in order to handle photographs

Monitor Sizes

Jenzabar, Inc. recommends at least 17” viewing station monitors. Jenzabar, Inc. also recommends 19” or 21” scanning stations. Larger-sized monitors save time because they allow the user to perform quality inspections after completing a scan without zooming or panning the page. A graphics card/monitor combination having a resolution of equal to or greater than 1280 x 1024 will also aid this quality assurance check.

**Note:** This is only a recommendation. Other specifications could impede adequate viewing of your image and require the use of the zoom feature to pan across the image.

Database Connectivity

Document Imaging is a client/server application that runs in a Microsoft Windows 32-bit environment. It needs two ODBC drivers to connect to the CX database. The first ODBC driver connects to the database directly. It is recommended that the Intersolve 3.10 driver (distributed in SMO 12550) or the Informix 3.3 driver (distributed in SMO 12588) be used for this purpose. In addition, the CX ODBC driver version 1.54 (distributed in SMO 12588) is needed to connect to the application servers.

Image Server

Document Imaging will work with any storage environment that presents itself to the program as a drive letter. Such storage environments include, for example:

- Novell file server
- NT file server
- NFS mounted file system on host
- Smb accessed file system (SAMBA)

It also will work with UNC names (e.g., \ server name\ path) that are recommended instead of drive letter mapping for ease of user workstation administration.

Jenzabar, Inc. recommends that the image server be located on the network segment containing the bulk of the users. This arrangement keeps the bulk of the image traffic local to that segment if you also use a means of isolation, such as bridges or switches.

Jenzabar, Inc. also recommends that the institution use a fast drive for storing current document images, such as a hard drive or single optical disk. However, documents archived for legal
reasons, which are only retrieved for an occasional spot check, can be stored inexpensively on a CD-ROM (DVD-ROM) jukebox. The storage requirements for a document typically range from 25-100 kilobytes (for bi-tonal images).
SECTION 2 - TABLE SETUP

Overview

Introduction
This section provides information about the tables and records used by Document Imaging. You must set up the tables to reflect the institution's desired operating configuration. The four categories of tables and records are described, followed by information on building the primary tables when you install the system.

Standard CX Records
Document Imaging currently uses the following standard CX records:
- Contact record (ctc_rec)
- Education record (ed_rec)
- ID record (id_rec)

The Contact record (ctc_rec) and Education record (ed_rec) contain the im_doc_no column to associate a Data record with an Index record (im_doc_rec). The list of records to which a document image may be linked will expand in the future.

Institution-Specific Records
The following records are those that contain actual institutional data that grow with time and normally do not need any administrator maintenance:

Image Document record (im_doc_rec)
Contains the indexing information that allows for retrieval of the images.

Image ID Volume record (im_id_vol_rec)
Contains all ID volume associations. Speeds up the allocation of a new image to a volume that already contains images for the same ID. This is particularly important if the main document server for current images is a jukebox (this is not recommended).

Image System Administration Tables/Records
The following tables are set up either once during the implementation or are handled by the system administrator.

Image Volume record (im_vol_rec)
Stores information on every volume Document Imaging uses. The system administrator must add an entry to this table whenever a new volume is created. The Table Maintenance program allows the system administrator to add a new row to this table and simultaneously add the required directory on the correct server.

Image System table (im_sys_table)
Contains information on each Document Imaging System on the campus.

Note: Each Image system may have one or more image servers to hold the image files. On the other hand, Image systems may share a server.
**Image Server table (im_server_table)**
Defines each server and Image system it uses. Typically, a server will have one type of media, such as a hard drive or a CD-ROM drive.

**Image Volume table (im_vol_table)**
Defines the type and characteristics of the volumes a server uses. A volume can be a hard drive, optical disk drive, or CD-ROM drive.

**Image Global Configuration table (im_glbl_cfg_table)**
Holds configuration information for the Document Imaging System. The system uses this table to emulate serial fields (which ODBC does not currently support). This table normally does not need maintenance except for initial setup. A correctly functioning Document Imaging System will only contain one row in this table.

*Note:* In version 2.1 of Document Imaging, this table will be removed or at least no longer used for this purpose, because the add_ser_aps application server will resolve the problem.

**Document Type Tables**
The following tables may need routine maintenance by the Document Imaging System administrator, who may be a member of the workgroup using the system. You must change these two tables as you encounter new document types.

*Note:* These tables must be maintained by a Document Imaging system administrator, a user with knowledge of how the system is used in the workgroup itself. This user must know how the workgroup has been working with the paper documents and how they want to use the new system. The user does not have to be a shell user.

**Image Document table (im_doc_table)**
Contains information about each type of document Document Imaging handles. For example, each entry allows one to determine whether a scan of the corresponding document will cause any action to take place regarding the Contact record.

**Image Scan Code table (im_scan_cd_table)**
Defines the scanner parameters to use when scanning a document type. Parameters include brightness, resolution, and margins.
Building the Primary Tables

Introduction

You must set up the following tables when installing Document Imaging:

- Image Server table (im_server_table)
- Image System table (im_sys_table)
- Image Volume table (im_vol_table)
- Image Volume record (im_vol_rec)
- Scan Code table (im_scan_cd_table)

Note: For illustrative purposes, this section provides example setup values including:
- An Image system, identified using the code “FA1” and, having a hard drive for its server with a capacity of 2 GB
- A server named “FANETHD1” that is physically located on the network file server (accessed as drive H:)

Access

You access the Document Imaging tables using the Table Maintenance icon on the desktop.

Image Server Table (im_server_table)

You make entries to this table to describe the various servers that handle image storage for the image systems used at your institution. Make the following entries to this table:

server_code  
Enter the name of the server (e.g., FANETHD1).

image_sys  
Enter the image system name containing this server (e.g., FA1).

server_code_desc  
Enter a description of the server (e.g., FA1 network server).

server_type  
Enter the server type code (e.g., DRV).

server_loc_code  
Enter the code describing the physical location of the server (e.g., LCLNET).

last_bkup_date  
Enter the date (mm/dd/yyyy) of the last backup for this server.

server_image_root  
Enter the root directory for the server (e.g., H:\CARS\IMAGES).

Note: The drive letter (e.g., H:) that you enter must appear on the client station or use a UNC name (e.g., ImageServer\CARS\images).

use_alias  
Enter N (for No). This denotes that an alias will not be used in the pathname for volumes in this image server.

Note: This column is not currently used.
active_date
Enter the date (mm/dd/yyyy) that you made setup entries.

inactive_date
Enter the date (mm/dd/yyyy) when this becomes inactive.

Image System Table (im_sys_table)
You make entries to this table to define the system-wide information for each Document Imaging System used at your institution. Make the following entries to this table:

image_sys
Enter the name of the image system (e.g., FA1).

system_desc
Enter a description of the image system (e.g., Financial Aid System 1).

deflt_sec_code
Enter the default security code for the image system (e.g., DRFG).

deflt_server
Enter the default server code for the image system (e.g., FANETHD1).

deflt_prealloc_amt
Enter the default amount to preallocate for an ID on the image system. You can determine this amount by doing the following:
- Make an estimate of the average number of documents expected for an entity in this image system.
- Make an estimate of the size of these documents based upon a value determined by testing using the locally determined scan parameters.
- Divide the product of the above two numbers by 1000. Use the result as the default amount.

Note: See Allocation Amounts and Preallocation Amounts in this guide for more information about estimating this amount.

use_sess
Enter Y (Yes) or N (No) indicating whether to use the session code when checking available volumes.

use_yr
Enter Y (Yes) or N (No) indicating whether to use the year code when checking available volumes.

use_acyr
Enter Y (Yes) or N (No) indicating whether to use the academic year code when checking available volumes.

tick
Enter the tickler code that the program will use for this image system for all of its Contact record (ctc_rec) manipulations. This field can have three types of values:
- An actual tick code (e.g., “ADM”).
- The code word “ACYR”, which tells the Document Imaging program to use the current value of acyr.
- The code “FY—”. This type accommodates those schools that use FY97 for a tick code, where 97 is the first two digits of the acyr.
deflt_bat_scn_cd
Enter the default scan code to use for this image system when scanning documents in batch mode (e.g., ASDFD).

active_date
Enter the date (mm/dd/yyyy) that you made setup entries.

inactive_date
Enter the date (mm/dd/yyyy) when this becomes inactive.

Image Volume Table (im_vol_table)
You make entries to this table to describe general properties of the physical device for the imaging system. Make the following entries to this table:

vol_code
Enter the volume code for the device (e.g., HDRV2GB).

vol_code_desc
Enter a description of the volume code (e.g., 2 GB hard drive).

max_prealloc
Enter the maximum preallocation amount (in kilobytes) for the volume (e.g., 2362232). To determine this number, do the following:
- Increase the actual number of bytes capacity of the drive by 10 - 20% (10% was used for the example number).
- Divide the result by 1000.

Note: Experience with the actual data will provide a reasonable value to this factor. It could vary with the image system and institution.

max_alloc
Enter the maximum physical size for the volume (e.g., 2137484). You should subtract at least 10,000 kilobytes (KB) from the physical size amount. The example number was determined by subtracting 10,000 (10,000,000 bytes) from the actual capacity of the 2 GB drive.

Note: You will need experience with the actual data to determine exactly how much to decrease the actual capacity.

media_type
Enter the media type code for the volume (e.g., M). The codes are as follows:
- M for Modifiable (standard for hard disks)
- R for Read only (for CD-ROMs)
- W for WORM (Write Once Read Many)

active_date
Enter the date (mm/dd/yyyy) that you made setup entries.

inactive_date
Enter the date (mm/dd/yyyy) when this becomes inactive.

Image Volume Record (im_vol_rec)
You make entries to this record to define the volumes that the Document Imaging System tracks. Make the following entries to this table:
vol_no
Enter the integer value that gives the volume number for the volume this record describes (e.g., 6).

vol_code
Enter the volume code defined in the Image Volume table (e.g., HDRV2GB).

image_sys
Enter the image system (e.g., FA1).

sess
Enter the session code for selecting a row (e.g., FA).

yr
Enter the calendar year for this row (e.g., 2000).

acyr
Enter the academic year for this row (e.g., 9900).

num_sub_vol
Enter the number of subvolumes on the image volume (e.g., 50). Divide the max_alloc of the volume by the average preallocation amount to arrive at a number of entities for which the drive might hold documents. You must then determine a num_sub_vol value that will allow the number of entities in each sub_volume to be less than 100. A rule of thumb for many file systems is that for good performance, no directory should contain more than 100 files or subdirectories.

tot_prealloc
This value is automatically maintained by the system and should never be manually adjusted.

tot_alloc
This value is automatically maintained by the system and should never be manually adjusted.

server_code
Enter the code describing the server containing this volume (e.g., REC1SRVR).

vol_stat
Enter the code describing the current status of this volume (e.g., A).

alias
Enter the alias for this volume for retrieval in the file system (e.g., AAA). The alias field is not currently used.

active_date
Enter the date (mm/dd/yyyy) that you made setup entries.

inactive_date
Enter the date (mm/dd/yyyy) when this becomes inactive.

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Estimating the Number of Subvolumes

The example number for the subvolume number, 50, assumes 2000 volume capacity with each entity (i.e., student, individual, etc.) having an average of 1 MB of document image files. The previous values imply 2000 entity directories on the disk, which is too many to search efficiently. To avoid this inefficiency, enter 50 as the number of subvolumes so that there will be no more than 40 ID directories in each subvolume.

Note: This number is used only when deciding where to store the document file. The number is stored in the Index record, and upon retrieval, is used to generate the path name. An implication of this usage is that the num_sub_vol value could be changed.
during the lifetime of the volume and no harmful effects would occur. The results could look strange, and this action is not recommended.

Image Files Storage Location

For example, you want to add a document file (for ID 2007) to the volume. If you set the number of subvolumes at 50, the system stores the image in subvolume 7. This subvolume number was obtained as the remainder when the id_no was divided by the value of the num_sub_vol.

Assume that this document file is being stored in volume 1. Also assume that the current document is document number (serial number in im_doc_rec) 500. In this case, the system stores the document file in the actual full path: H:\CARS\IMAGES\VOL00001\7\2007\500.000

The system arrives at the following pathname:
$\{server_image_root\}\VOLnnnnn\mm\id\doc_no.000$, where $nnnnn$ is the volume number formatted to 5 places and $mm$ is the subvolume number.

Allocation and Preallocation Amounts

The proper setting of preallocation amounts is important for minimizing the time taken to retrieve a document file from the server. If the server is a jukebox, for example, and a user is stepping through an individual's document images, a delay of as much as 10 seconds can occur while the jukebox changes disks. To avoid this delay, all the Document Image files for a single entity for the given image system and period must reside on the same surface of the same disk; therefore, you must estimate a maximum preallocation amount for each entity for this image system.

The preallocation amount is actually an average estimated value. Whenever a new entity is added to the disk (volume), the system adds this amount to the preallocated amount total (tot_prealloc) for the volume in the Image Volume record (im_vol_rec). When the value of this total exceeds the maximum preallocation amount for the volume in the Image Volume table (im_vol_table), the system should add no further entities to the volume.

The allocation amount is a low estimate of actual amounts used. The allocation amount of each file is added to the total allocation amount. The disk will become full once the value approaches the maximum allocated amount.

Over-Subscribing Volumes

Since few entities in an image system typically will contain every document they might receive, the preallocation amount factor allows for over-subscribing the volume with entities. Disk space is allocated under any operating system in fundamental blocks called allocation units. This is typically some multiple of 512. If the system measures file sizes by operating system calls, these usually are the actual file size, not the allocated amount. Since the actual allocated amount will be, on the average, one half of an allocation unit larger than the file size, you should reduce the maximum allocated amount from the actual disk capacity slightly to allow some extra room on the disk. In this example, the reduction was 10 megabytes, which probably is not conservative enough.
SECTION 3 - PC INSTALLATION

Overview

Introduction

This section provides information and procedures for end users to install Document Imaging on their PCs. The various installation options for users are explained, followed by the procedure to install Document Imaging.

Tasks Prior to Installation

You need to accomplish the following general tasks at your institution before you install Document Imaging:

- Install the CX ODBC driver as instructed in the CX ODBC Driver Installation Guide.
- Document Imaging now requires that you install the Informix driver (see SMO 12550 or 12588). You also must use the CX driver. See the CX ODBC Driver Installation Guide for more information about installing these drivers.
- Close any applications you may have open and disable virus-checking software, but do not exit Microsoft Windows. The Document Imaging setup program cannot install system files or modify shared files if they are already in use. These system files may be used by any toolbars, such as the Microsoft Office Toolbar, or even by programs that have icons in the system tray.

Canceling the Installation

You can cancel the Document Imaging setup program at various points of the install. To exit the setup program, select Exit Setup.
The Document Imaging System window appears. Select **Yes** to exit the setup program.

![Image of the Document Imaging System window with Yes and No buttons]

**CAUTION:** If you cancel the Document Imaging setup program, you must re-run the setup program to complete the installation of Document Imaging.

![Image of a message box stating that the setup was interrupted and options to run it later]

Jenzabar Document Imaging System Setup was interrupted before your new software was fully installed.

You can run Jenzabar Document Imaging System Setup in its entirety at a later time to complete the installation.
Installing Document Imaging on a PC

How to Install on a PC

Follow these steps to install Document Imaging on an end user’s PC using Microsoft Windows (where Windows refers to Windows 98 or later, Windows NT 4.0, and Windows 2000 or later).

**CAUTION:** Installation time will be greater for systems that had a previous version of Document Imaging installed.

1. Start Microsoft Windows.
2. Disable virus-checking software and close any applications that are open. This includes any toolbars that may be on your desktop, such as the Microsoft Office Toolbar.
3. Use Microsoft Windows Explorer to locate the directory containing the setup.exe program.
4. Double-click on the setup.exe program. The following windows appear.

   ![Install](Image)

   Copying Files, please stand by.

   ![Jenzabar Document Imaging System Setup](Image)

   Welcome to the Jenzabar Document Imaging System installation program.

   Setup cannot install system files or update shared files if they are in use. Before proceeding, we recommend that you close any applications you may be running.

5. Click **OK** to continue or **Exit Setup** to exit the program.
6. The program will install to the directory specified in the **Directory** field. If you want to change the directory, click **Change Directory**. If you do not want to change the directory, click on the button (i.e., the icon showing PC hardware). The setup program checks for disk space and begins to install the files of Document Imaging using the path shown in the Directory field.

7. The **Choose Program** window appears. Enter a new group name to which the user will be associated with in the **Program Group** field, or select an appropriate group from those listed in the **Existing Groups** box.

8. To proceed with the installation, click **Continue**. To exit the installation process, click **Cancel**.

9. The program installs data access components and initializes setup. If successful, the **Destination File** window with a status bar appears.
10. Messages on the screen will notify you that the setup is updating your system and creating program icons. Finally, a message window appears to notify you of a successful installation. Click **OK** to close the window.

11. Re-enable the anti-virus checking program, and then do a scan. Your Document Imaging System is now ready to use.
PROGRAMS

Overview

This section provides information about additional programs in the Document Imaging package:

Table Maintenance Program
Index Maintenance Program
Image Audit Program
Batch Scan Program

Table Maintenance Program

The Table Maintenance program is a basic data entry program and is available to aid in the maintenance of the Document Imaging tables. A designated person(s) should be assigned access to the Table Maintenance program to ensure the integrity of your tables. A Table Maintenance shortcut to your desktop can be created from the imagetbl2.exe program in the Document Imaging System's directory. The Table Maintenance program can also be accessed via the Start menu (Start/Programs/Document Imaging System/Table Maintenance of Document Imaging System).

A key feature of this program allows a corresponding directory to be added to the corresponding file system when a Volume record is added (given by the server root path in the server for the server specified in the Volume record). This assumes that the user of this program has access to that path from the workstation being used.

Using the Table Maintenance Program

1. Once the program loads, the user chooses the Table Drop-Down menu and selects the desired table to edit.

   Note: This menu has two regions. The first region has a list of data tables, including Contact table (ctc_table), Document table (im_doc_table), Scan Code table (im_scan_cd_table), Server table (im_server_table), System table (im_sys_table), and Volume table (im_vol_table). The second (lower) region has two important data records: Document record (im_doc_rec) and Volume record (im_vol_rec). The im_doc_rec is the Index record for the Document Imaging System and is read-only.

2. When a table has been selected, the primary commands used in table maintenance appear from the toolbar: Query, Update, Add, Commit, and Cancel.

3. Only the Query and Add buttons are active when the screen initially appears.

4. It is necessary to first do a query on the table unless adding another table is desired. If an add is desired, choose the Add button, add the data, and then Commit.

5. For any other action, choose Query. If all rows are desired, then choose OK in the Query mode without entering any data and all rows will be brought into the grid.

6. To select a row, double-click on that row in the grid. The row is brought up in an edit window.

7. To update or change a value, choose the Update button, change any desired values, and then choose Commit. If no change is desired, choose Cancel.

8. If additional updates are needed, choose the Grid button on the edit screen to go back to the grid and make another selection.

   CAUTION: In this version of the program, there is an index that causes a circular dependency to occur between the System table and the Server table. One needs
to know the Document Imaging System in order to add a server, and one needs to know the server to add a system. In this case, it is necessary to add any server to the System table and add the record (via senter2). After a new Server record is added, the System record should be modified to use the new server value.

**Index Maintenance Program**

The Index Maintenance program is provided for ease in repairing some simple errors that end-users occasionally make when scanning documents. This utility can be accessed either by the Start menu (Start/Programs/Document Imaging System/Index Maintenance of Document Imaging System) or by creating a shortcut to your desktop. It is useful because the document files in the Document Imaging System contain a copy of the Index record embedded in the file. Because of the existence of this embedded data, data cannot be changed in the Index record using senter2, at least not if data integrity is important.

**Example:** A common user error is specifying the wrong document type at the time the document is scanned and saved. The user may have the person that maintains the system use senter2 to modify the Index record, but then it would not match the embedded copy in the document file.

The Index Maintenance program will allow the user to select a particular document and then modify a value in a column in the Index record. When the user commits the work, the data is written back to the database and is also updated in the copy of the Index record that exists in the document file. There is a restriction on the changes that may be made to this record. Only changes that will not affect the location of the document file may be made, and sometimes even those changes are not valid. Given the contents of the Index record, the physical location of the file is determined by the contents of the following columns: im_doc_no, id, volume_num, and sub_vol_num. The location of a document is given by server_root_path/VOLnnnnn/mm/iiiiii/, where the server_root_path is the value in the Server record for the image server containing the volume, the volume_num value is nnnnn, the sub_vol_num is mm, and the id is iiii. The name of the document is currently im_doc_no.000, where the 000 is currently the only extension used. Therefore, a document may be selected and the contents of all columns but the im_doc_no, id, volume_num, and sub_vol_num may be modified in order for the program to update both the row in the Index record (im_doc_rec) and the embedded copy of this row in the document file.

Because they are automatically assigned, it is unlikely that the operator will want to change the value of im_doc_no and sub_vol_num. However, it is not unlikely that the id may be entered wrong; and it is possible that the wrong server might be chosen by the person doing the scanning, in which case the volume could be wrong. If these errors happen, the only recourse is to manually delete both the Index record and document file. That involves determining the location of the document file from the data in the database. With the Index Maintenance program, both the Index record row and the document file may be easily deleted without having to figure out the location of the document file.

**Note:** The design implications of changing the im_doc_no are currently under consideration. The more ties to other records that occur, the more difficult it will become to decide the proper course of action when a row in the im_doc_rec is removed. The Image Audit program will probably have to be extended to handle this situation.

In operation, a document is selected in the same way one is selected in the Document Imaging program. When the OK button is clicked, a Modified View screen is displayed. This screen has two new buttons. The Delete button removes both the Index record and the corresponding document file. If the Display button is selected, a new screen is displayed where some values may be modified. Modifications are done by selecting the corresponding radio button, and then entering the new value in the box at the bottom of the screen. When the OK button is selected, the internal value for that column is changed. If any value is changed, the Save button is activated and, if selected, modifies both the Index record and document file.
Image Audit Program

The Document Imaging System stores its output in two separate locations. The first location stores data that goes into various tables in the CX database. The second location stores the document file that goes into the file system of some server, which may be different than the one that contains the database. In these situations, there is always the possibility that system errors or operator errors may remove one of a pair and not the other. A worst-case scenario is the situation where the document file is inadvertently removed while the row in the Index record is left in place. A user will see the document as present on a list of documents for the entity; but when the document image is requested, the viewing program will return an error because it cannot find the document file at the location specified by the data in the database.

In order to test for problems of this nature, an Image Audit program (imaudit2.exe) is provided. This program is in the Document Imaging System installation directory and may be accessed either by a shortcut on the desktop or through the Start menu (Start/Programs/ Document Imaging System/ Document Imaging Audit Program). The Image Audit program will walk through a subset of the Index record rows (e.g., those on a particular volume) and check for the existence and match of the document file.

Note: Currently, this program does not walk the directory tree of a particular volume on the Image server and verify against the database.

When a volume is selected to audit, the program determines the number of documents stored in this volume and displays the minimum and maximum document numbers. If the Audit button is selected, the audit operation proceeds. A log file name is determined, and then the audit output is sent to this file.

Batch Scan Program

This version of the Document Imaging System allows the scanning of a batch of documents at one time with a scanner that has a document feeder. These documents are stored temporarily in a holding area and then brought up one at a time and indexed later. This means the person doing the scanning could be different from the person doing the indexing. A client wanting to do centralized scanning would appreciate this capability. This program may be run from the Start menu (Start/Programs/ Document Imaging System/ Batch Document Imaging Program) or from a shortcut on the desktop. The shortcut should start the batchdocim2.exe program in the Document Imaging directory.

The Batch Scan program has two basic actions, Scan and Index. The Scan action operates as a simplified version of the main Document Imaging program. In this program, however, there are three modes in which it may run:

<table>
<thead>
<tr>
<th>MODE</th>
<th>ASSUMPTION</th>
<th>USEFUL</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>Documents have been sorted with the same id</td>
<td>When doing retro-conversion at the beginning of the installation</td>
</tr>
<tr>
<td>Second</td>
<td>Documents have been sorted with the same document type</td>
<td>When the person receiving mail in the office separates it into sets of document types</td>
</tr>
<tr>
<td>Third</td>
<td>Documents are simply a random selection of documents</td>
<td>When no sorting is done on the documents except maybe for those that will work in the...</td>
</tr>
</tbody>
</table>
Note: Dark or unreflective documents and the type of paper are factors that might impede scanning.

When the Scan action is chosen, there are two options for the user. The first is to scan additional documents into a previous batch. The second option is to create a new batch. If new documents are to be scanned into an existing batch, then the appropriate batch is selected from the grid. At this point additional documents may be scanned into the batch. This type of operation may be done at any time unless all previously scanned documents have been indexed, in which case, the batch is set to a finished status and no more documents may be added to that batch.

If a new batch is started, then some information must be entered about the batch. The most important of these values is the id or the document code. Entering a value into either of these fields determines the operating mode. The effect of this mode is to constrain the indexing operation to allow only the appropriate value of the chosen field. In other words, if the id is given a value during the scan operation then the indexing operation may not override this value. Similarly, the document type may not be overridden if it was set during the scan.

If the Index action is chosen, the user must first choose a batch to index. Once an appropriate batch is chosen the user can select the Index button. A viewing screen displays the document and allows either a document type or an id to be entered. Once the value is entered, the Save button is activated and the document may be saved. Alternatively, the user may select the Skip button and skip the indexing operation on the current document. This action might be taken, for example, if the image is not of sufficient quality to be saved. At the end of the indexing operation, the user can rescan any skipped documents and add them to the current batch or a new batch.
INDEX

A
allocation amounts, 13

B
Batch Scan, 23

C
canceling the installation, 15

D
database connectivity, 5
document file, 2
Document Imaging
description, 1
installing, 17
process of installation, 1
programs, 21
versions of, 1

G
guide
purpose, 1

H
hardware
requirements, 4

I
Image Audit, 23
Image Document record, 7
Image Document table, 8
Image Global Configuration table, 8
Image ID Volume record, 7
Image Scan Code table, 8
image server, 5
Image Server table, 8, 9
image system, 2
Image System table, 7, 10
Image Volume record, 7, 11
Image Volume table, 8, 11
Index Maintenance, 22
installation options, 15
installing
Document Imaging, 17
process, 1

M
monitor sizes, 5

O
over-subscribing, 13

P
page image
described, 2
preallocation amounts, 13
programs
Document Imaging, 21
PROGRAMS, 21

R
records, 7
Image Document, 7
Image ID Volume, 7
Image Volume, 7, 11

S
scanning stations, 4
server, 2
subvolumes, 12

T
Table Maintenance, 21
tables, 7
Image Document, 8
Image Global Configuration, 8
Image Scan Code, 8
Image Server, 8, 9
Image System, 7, 10
Image Volume, 8, 11

V
viewing stations, 4
volume, 2