
DEFENSE CONTRACTS MANAGEMENT DISTRICT WEST

EL SEGUNDO, CALIFORNIA

NORTH AMERICAN EXCELLENCE AWARDS: WORKFLOW, MERIT

EXECUTIVE SUMMARY

The Defense Contracts Management District West manages defense contracts for the military services. The Headquarters is located in El Segundo, California. DCMDW is one of three such Districts worldwide. The District manages 125,000 government contracts, valued at more than \$458 billion, for the Defense Department and its agencies, National Aeronautics and Space Administration, other federal departments and some foreign governments.



Figure 1—DCMDW Region

DCMDW has more than 5,800 employees assigned to 30 field activities, major contractor facilities and district staff. Some employees are resident at major defense contractor plants, while others are in offices that cover large geographic areas. The District provides contract

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oversight on a large number and wide range of products, including aircraft, space launch vehicles and spacecraft, medical and subsistence items, electrical and electronic commodities, military vehicles, munitions, petroleum, chemicals and lumber.

The Federal System Integration Management Center has previously documented DCMDW's requirements for the implementation of an Office Automation Improvement Program (OAIP) for improving information management within its organization (OAIP Requirements Analysis/Functional Description Report, July 1994). OAIP is about DCMDW improving organizational efficiency through reduction in paperwork. DCMDW's goals are the overall reduction of paper, the associated reduction of the costs incurred by processing paper, and improved efficiency of DCMDW processes. The goals are being accomplished through re-engineering the current processes and applying "imaging technology" to achieve a paperless environment. DCMDW selected Universal Systems Inc. as the contractor for this project.

The first DCMDW imaging system is the Official Personnel Folder (OPF), maintained by the Human Resources department. DCMDW is improving OPF processing by converting their hard copy OPF to an electronic image format, the DCMDW Totally Imaged Federal File (DCMDW TIFF).

An OPF is established for every civilian federal employee and contains records and documents pertaining to their rights and benefits. The OPF "travels" with an employee throughout his or her Federal career as they move from one Federal Agency to another. The OPF and its contents are controlled by and belongs to the Office of Personnel Management (OPM).

DCMDW requested and received approval from OPM to test their proposed alternative record-keeping process. The new process was designed specifically to conform to OPM criteria to provide access and work process improvement. Each document was scanned, indexed and stored electronically. They are available for retrieval, viewing, and printing.

The new electronic system enhances the functionality of the files by providing concurrent access to folders, tools to analyze the types of documents in the folders, and provides a workflow tool to enhance Human Resources processing.

One of the most critical documents in an OPF is the SF-50 (Notification of Personnel Action). The DCMDW employee database is updated by batch input to their mainframe that is located in Columbus, Ohio. Manual input is generated by request documents from supervisors and managers, such as the SF-52 (Request for Personnel Action) and hard copy documents from employees. When the database is updated (at least three times every two weeks) it creates an SF-50 ASCII file. The ASCII file was previously used to prepare a hard copy SF-50. The SF-50s were printed then distributed to personnel clerks who located the printed SF-52, *manually* compared the SF-52 and SF-50 for accuracy (updating the database as errors were identified), signed the action, then manually mailed each SF-50 to the supervisor of the employee. Timely updating of the database is critical to ensure accurate employee pay.

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Workflow is being used in TIFF to electronically generate the SF-50 and to electronically compare the 2 databases to identify errors. Work is then distributed to individual inbaskets for authentication. The electronic OPF has produced a savings both in efficiency and effectiveness.

DCMDW is leading the way for other Department of Defense agencies who want to apply “imaging technology” to their current methods.

INNOVATION

Innovative Use of Technology

The following are examples of how technology was used in DCMDW-TIFF:

- Daily mainframe downloads are used to automate user identification, OPF indexing, organizational changes, etc.
- A graphical WorkFlow Builder was deployed to provide an easy method for the user to visually design, create and modify workflow as the business process changes. Functionality that was previously required to be programmed by systems integrators can now be setup by the users themselves.
- Lotus cc:Mail and Delrina Formflow are tightly integrated into the DCMDW-TIFF system.
- Special server software was written to convert proprietary image format to TIFF GROUP IV, which is the industry standard.
- “Distributed Images” solution is used to speed up the access time. Most imaging solutions have a central location for all the images. In the case of DCMDW-TIFF, the images are distributed and stored at various locations as well as the central location, the headquarters. The synchronization of all the files are accomplished by a special server software designed by USI.
- Fax server technology is integrated in TIFF. This enables the OPF user to send and receive faxes from their workstations.
- Softscan technology was integrated. Softscanning is the process of converting a document, such as a Microsoft Word document, into an image. In the DCMDW-TIFF system, the document information downloaded and injected into the workflow is first converted into a FormFlow document enabling the personnel specialists to modify the data, if necessary, prior to storage. This image is then converted to a TIFF image and stored on a RAID. *See* Redundant Array of Inexpensive Device (Redundant Array of Inexpensive Device) system providing a permanent, unalterable record of the document. Integration of this technology removed the step of printing hard copies

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then scanning and indexing.

- The DCMDW Wide Area Network (WAN) was expanded on the existing Information Technology infrastructure to support the bandwidth required for moving images across a network.
- The OPF file servers utilize Novell's NetWare 4.1 SFT III, an add-on service to the NetWare 4 operating system. SFT III, is a fault-tolerant, mirrored-server solution that provides server synchronization between two-mirrored network servers connected through their network adapters. If one server fails, the second server ensures continuous transaction processing without loss of data or service to network users. NetWare 4.1 SFT III offers the highest level of server fault tolerance in the networking industry, ensuring that there is virtually ZERO downtime.
- Compaq "hot-swappable" disk drives are used. If a drive fails, this allows drives to be removed and replaced without powering down the server.
- "Industry Standard" Group IV TIFF was the compression format used. This allows the transfer of DCMDW OPFs to other image enabled activities (portability).

Degree of Complexity in the Underlying Business Process and IT Architecture

OPF was delivered to support DCMDW's Human Resources department as well as the over 5,800 employees serviced by the HR group. Human Resources itself has sub-organizations, or "Teams", to service the different locations around the country.

DCMDW-TIFF also had to deal with the existing IT infrastructure, such as:

- Enhancing the existing network to sustain the bandwidth necessary for images
- Educating DCMDW HR personnel regarding scanning, image quality, etc.
- Educating DCMDW end users

Advanced Workflow and Imaging Concepts

DCMDW-TIFF employed Documetrix Workflow. Through the use of Documetrix Workflow the following automation was implemented:

- Automatic distribution of "SF-50" Notification Actions to Human Resource Specialists. SF-50 actions are automatically "injected" into the workflow as soon as the District mainframe downloads the ASCII file to DCMDW. Workflow then distributes the actions accordingly.
- Electronic notification to employees and supervisors through cc:Mail with a copy of the SF-50 attached.

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- Distributed Images technology is being implemented to provide employees at remote sites with rapid response time to view their files. The users in the field will be able to pull up their OPF as quickly as those users at the headquarters location. Eventually, employees will be able to view their OPF at their own desktop computers.

DCMDW-TIFF employed many imaging concepts. They include:

- Group IV TIFF
- WAN capable of supporting imaging
- DCMDW-TIFF also supports the annotation of an image without physically modifying the original image. Annotations are stored as overlays to the image. Images can be viewed with or without the annotations. Annotations can be secured, prohibiting users from creating, modifying or viewing annotations. Printing of images with annotations is fully supported, however DCMDW is not currently using annotations to maintain compliance with OPM requirements.

DCMDW-TIFF supports the following types of annotations:

- *Redlining*, to create lines to point to areas on the image that require referencing
- *Highlighting*, to highlight an area of the image that requires attention
- *Post-it notes*, to create “sticky” notes that can be positioned anywhere on the page
- *Black-out*, to “black-out” an area on the image that should be kept confidential
- *White-out*, similar to “black-out”, except the area is *overlaid* with a white block
- *Inline Text*, to create text that can be positioned anywhere on the image.

THE SYSTEM APPLICATION

DCMDW-TIFF is an imaging and workflow system designed to automate OPF processing for employees of the Defense Contract Management District West (DCMDW). It is designed to convert paper documents into electronic images that are stored and available for retrieval, viewing and printing. In addition, electronic data is imported and routed for processing.

The system users are human resource personnel located at DCMDW headquarters in El Segundo, California as well as all employees in the field offices that comprise the western region. There are also future implementation plans for human resources personnel in Chicago, IL. DCMDW-TIFF is a full production system in operation seven days a week, twenty-four hours a day.

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The DCMDW-TIFF project entailed the following:

- Conversion of existing documents: The hard copy documents from each OPF were reviewed and prepared for scanning; including removal of staples and any folds or irregularities straightened. The documents were then scanned and indexed. The indexes enable future retrieval of the documents. Over 5,800 employee folders were scanned, some containing as many as 250 documents and 100 percent verification was performed of the electronic image against the original document.
- Designing enough functionality and flexibility into the system to allow the same tasks performed on paper documents be performed on the electronic image.
- Utilized existing government local and wide area network facilities and communications lines to create an integrated systems environment that covers the 15 states that comprise the DCMDW's region.
- Executed a vigorous training program that included:
 - Training approximately 80 Human Resources personnel on processes and application functionality including document preparation, scanning, verification, workflow processing and supervisor and employee notification.
 - Technical training to the appropriate Information Systems personnel.
 - User training to approximately 100 field office employees who in turn trained their local people.

THE KEY MOTIVATIONS BEHIND THE SYSTEM

DCMDW Human Resources restructured into teams in 1994. Human Resources reorganized as the result of command commitment to improve service and their own realization that they must become a Customer Oriented business in order to both survive and to stay competitive with other organizations who would like to have their business.

They wanted a holistic business enterprise approach. The goal was to develop a Human Resources Business System that focused on improving customer satisfaction and produced service measures within the Human Resources organization. Identifying key processes within Human Resources and then applying automation to those processes to improve service and reduce paper developed the business system. Prior to this activity, processes were fragmented, labor intensive and it was increasingly difficult to maintain high service levels.

The HR office wanted both internal and external users to be able to help themselves, because smart customers (both internal and external) are good business. The OPF is the foundation on which a majority of HR processes operate. Its' accuracy, timely update, and accountability is critical. The Wide Area Network (WAN) is the foundation for the Human Resources Business System. TIFF is the first step to an overall integrated, user friendly, and menu driven business system.

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In addition, previous employee notification processes were very time consuming. Before a form could be sent from headquarters personnel in El Segundo to an employee at one of the geographically separated offices, it had to first have a cover letter typed and attached to it. It had to then be specially packaged according to guidelines and labeled addressee only, hand-carried to the mailroom, delivered to the local municipal post office and mailed.

Once received, the first level supervisor of the employee had to be the physical recipient of the form and sit down with the employee for a joint review of the form. This was an extremely time consuming process and TIFF provided a powerful workflow process that significantly streamlined this operation.

THE CURRENT SYSTEM CONFIGURATION

The following describes the system configuration and hardware in use by DCMDW:

Software Used

Documetrix software was used to develop the Document Management System. The Documetrix solution is built upon an open systems environment client-server architecture. The open systems approach enables the support of a variety of databases (e.g., Sybase, Oracle, Informix, Ingres, etc.), a variety of networking environments (e.g., Novell NetWare, TCP/IP, Banyan VINES, Microsoft, LAN Manager, NT) or operating environments (e.g., UNIX, NT, Novell). The client-server architecture provides DCMDW with the modularity, scalability and flexibility that the client-server solutions can offer.

Documetrix is scaleable because it is based on a client-server architecture. A client-server architecture spreads functionality across separate servers to optimize the workload for the system. The open client-server architecture of the Documetrix solution enabled USI to provide DCMDW with a solution that provides the core functionality as more applications are developed and come on-line. The following are the Documetrix software utilized.

- Documetrix 2000 Server
- Documetrix 2000 API
- Documetrix Desktop Client
- Documetrix Workflow
- Documetrix Workflow Client
- Documetrix Workflow Server
- Documetrix Workflow API
- Documetrix Scan Software
- Documetrix/Teamworks Print Server

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DCMDW-TIFF was tailored specifically to the needs of human resources. Items that have been routed through the Workflow to a particular user are placed in an electronic basket. Automated Queues route documents to specific workstations based on decisions which the system makes automatically based on the information it queries from the document as well as from other databases on the network. A series of device servers are present throughout the workflow that perform automatic processes such as converting Formflow documents and archiving them into the appropriate folder.

Software Licenses by Location

Location	LAN Servers	Scanning Workstations	Printers	Retrieval Workstations
El Segundo	60	2	3	65
El Segundo	20	0	3	5
Santa Ana	40	1	3	21
San Francisco	20	2	1	11
San Diego	50	0	0	10
McDonnell Douglas	70	0	0	14
Flagler	100	0	2	16
Chicago	100	0	0	15
Dallas	20	2	0	10
Twin Cities	20	2	0	10
IRW	20	0	0	8
Rankford	100	1	0	10
Master Machine	20	1	2	11
Honeywell, Twin Cities	20	1	0	7
Costa				
Northrup	10	2	2	16
Indianapolis	20	0	2	16
Colorado Springs	20	2	0	10
United Defense	20	2	0	15
Twin Cities				
McDonnell Douglas	70	0	0	11
3.8				
Rockland Software	10	1	1	5
Flagler Trustco	20	0	2	10
Rockwell, Cedar	20	1	2	11
Regis				
St. Louis	10	0	2	14

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United Defense	20	1	1	1
Permacon	20	1	1	1
Sealed	20	1	1	1
T. Hughes Fullerton	20	1	1	1
Wichita	20	1	1	1
McDonnell Douglas	20	1	1	1
Alsea				
Blenny	20	1	1	1
McDonnell Douglas HIL	20	1	1	1
Blenny Wichita	20	1	1	1
Self Lake City	20	1	1	1
Van Nuys	40	1	1	12
Hercules	20	1	1	1
Frankel Self Lake City	20	1	1	1
Rockwell Canoga Park	20	1	2	6
Total	470	61	81	1371

There are over 5,800 active employees in the District who can access the system at any time from viewing stations located at the sites above. In the near future, all 5,800 desktops will be image enabled. In addition, there are approximately 80 users in the Human Resources department who use the system every day.

File Server Used

Dual Compaq ProLiant 1500s were used in conjunction with Novell 4.1 SFT III operating system to provide a Fault Tolerant solution.

The Compaq servers come standard with 32MB of ECC memory and were each upgraded to 160MB for DCMDW-TIFF. The system comes standard with 4.3GB storage and five "hot-pluggable" bays. For DCMDW, these bays were filled with 4.3GB drives, and were expanded further with the Compaq ProLiant External Storage System, for a total of 120GB storage on each server. All drives are hot pluggable, so if a drive fails, it can be removed and replaced without powering down the server.

These two servers are mirrored using the Novell 4.1 SFT III operating system. Netware 4.1 SFT III uses a high-speed Mirrored Server Link to provide server synchronization between the two Compaq ProLiant, which are connected through an FDDI network controller. If

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one server fails, the second server ensures continuous transaction processing without loss of data or service to network users. Netware 4.1 SFT III offers the highest level of server fault tolerance in the networking industry. Maintaining the same memory image and disk contents on a second physical server reduces hardware-related downtime. The flexible architecture allows routine maintenance tasks and server hardware upgrades to occur during normal business hours. The system administrator can take one server off line and perform the necessary maintenance and upgrades while the other server provides uninterrupted service to network clients.

Equipment Servers

Database/Index Server	Database/Index Server
CPU/RISC	HP SuperMin
Floppy Disk Drives	HP
Monitor	HP
Keyboard	HP
Host Adapter	HP SCSI
Ethernet Lan Card	HP Ethernet Adapter
Server Disk Drive	HP SCSI 1.5 GB

Database/Index Server	Database/Index Server
Operating System	HP HP-UX
SQL Database Engine	Oracle RDBMS
SQL Network	Oracle TCP/IP Server

File/Image Server	Novell Server
CPU Pentium/Processor, EISA	COMPAQ Proliant 1500 (2) 128MB, 4.5GB disk
Storage System	Compaq Proliant External Storage System Compaq 4.5 Hot Pluggable Drives (20)
Floppy Disk Drives	PC 3.5" drives
CD-ROM Drive	
Monitor	PC SVGA Monitor/Controller
Keyboard	PC Keyboard
Host Adapter	Adaptec AHA-1742B for Jukebox
FDD Controller	Timex Control
Ethernet Lan Card (EISA)	Intel EtherExpress 12
Optical Storage 32 channels	MDI Laserbank 524-4142 (4 GB)
SCSI Controller (EISA)	Adaptec AHA-1742B for 15 GB disk
Operating System	Microsoft MS-DOS 6.X
Network Software	Novell Netware 4.02
Image Server Functions	CSI Documentum® 2000 DDX2-1™ Lite Server (20 users)
Optical Storage	CSI Documentum® 2000 DDX2-25T Optical Access
Image Print Functions	CSI Documentum® 1000 DDX2-45T Print Storage (2 printers)

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Name/Database Server	Name Server
CPK 382	382 Oracle/Name Server

Scan Workstations

Scan/Canon Import Workstation	Documetrix® 2555 Scan/Canon Import WS
CPU Pentium 33 MHz	PC, 12A 16MB, 1.0GB disk, 5 1/4" floppy
Mouse	PC, Mouse
Keyboard	PC, Keyboard
Ethernet Lan Cards	3COM Ethernet 5
15-Inch Monitor	21" Cornerstone Monitor
Hi-Res Controller	ImageScan 2
Scanner Interface	Canon CR 3032 SC-3032-000
Scanner Interface	Adaptech 1547
Scanner	Fairfax 8200 Scanner
Operating System	Microsoft MS-DOS 6.2

MS Windows	Microsoft Windows 3.1
Database Access	Oracle SQL*NET for TCP/IP
Network Access	TCP/IP for DOS
Image Retrieval Functions	IBM Documetrix® 2555 IBM X2-351 Scan-ning

HiRes Scanning Workstation	Documetrix® 2555 Scan Workstation
CPU Pentium 33 MHz	PC, 12A 16MB, 1.0GB disk, 5 1/4" floppy
Mouse	PC, Mouse
Keyboard	PC, Keyboard
Ethernet Lan Cards	3COM Ethernet 1
15-Inch Monitor	21" Cornerstone Monitor
Hi-Res Controller	ImageScan 2
Scanner Interface	Adaptech 1547
Scanner	Fairfax 8200 Scanner
Operating System	Microsoft MS-DOS 6.2
MS Windows	Microsoft Windows 3.1
Database Access	Oracle SQL*NET for TCP/IP
Network Access	TCP/IP for DOS
Image Retrieval Functions	IBM Documetrix® 2555 IBM X2-351 Scan-ning

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Other Equipment

File Server	FAX Server
Processing Unit (MSRM)	PC 80-86/286Plus (MS 386) 250MB
VGA Adapter	PC VGA Monitor/Controller
Harder Disk Drive	PC 3.5 385 Floppy Disk
Business Unit Cards	PCX58 Modem/Link 7
Keyboard, Mouse	PC Keyboard, Mouse
Modem	Link Sep FAX/Modem 286/2400
Operating System	Microsoft MS-DOS 6.22
FAX Server Software	Optima FAXSYS LAN FAX FAX/286X.1A
Compression Scanning	Carroll Scanning Station
Scan Station	Genie 250A Workstation
Image/Text Printing	Network Printers
Post Printer (P)	HP LaserJet 4L
Network Interface (N)	HP 2000A for Novell/Net
16 Base T Ethernet	Network Concentrator
Network Concentrator	Bay (for 16) servers and workstations
Dial Up Access	Communications Server
Processing Unit	Citrix Server

IMPACT TO THE COMPANY

Impact to DCMDW has been phenomenal. They have streamlined the time it takes to perform tasks with regard to employee folders and forms processing. The routing of SF-50 forms from Columbus, Ohio to California used to take in excess of three weeks and can now be done in less than three hours. Because TIFF is integrated with other systems, it has subsequently streamlined other processes including cc:Mail and security.

DCMDW was the first agency to give employees the capability to view their own OPFs at the various satellite offices. Employees currently view their folders from designated viewing stations but will eventually have the capability to view it directly from their own PCs. TIFF allows the agency to comply more closely with established rules and standards, such as the Privacy Act. The previous method of folder review and folder distribution often required the OPF to be mailed outside of the human resources office. This increased the possibility of unauthorized access, security violations and potential loss of the hard copy OPF itself. In the event that an entire folder is lost, complete reconstruction of an OPF can be virtually impossible.

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The review time of employee folders by HR personnel has significantly decreased. The system response time in bringing a requested document image into view is approximately three seconds, whereas previously, a supervisor could spend an excessive amount of time searching through the physical paper pile for a correct document.

The major cost savings realized are in the following areas:

- Manual retrieval of hard copy files and documents were eliminated at savings of \$380,000/yr. in personnel costs.
- Files can no longer be lost or misfiled, which created savings of \$240,000/yr. in personnel costs.
- Files are no longer put back into the filing system, creating a savings of \$51,000/yr.
- Requirements for physical storage of 1.75M documents were eliminated, which is a saving of \$10,500/yr. in physical file cabinets.
- Floor space requirements for the file cabinets that housed 1.75M documents were eliminated at savings of \$19,900/yr.

Initial savings are greater than \$700,000 annually.

The system has resulted in productivity improvements in the following areas:

- Employees can now immediately identify and inform Personnel if there is a discrepancy or error within their folder.
- Increased ability to identify and correct errors on SF-50 forms and their SF-52.
- TIFF interfaces with other DCMDW systems, such as cc:Mail and, DBMS, SF-52, DBU, RFAS.
- The security designed into the system precludes an individual from adding, changing or deleting any document in their own folders.
- Streamlined the manual fax process by allowing total on-line fax capability.
- TIFF utilizes state-of-the art grayscale monitors that enhance the quality of an image.

The integration of TIFF with cc:Mail and Delrina Form Flow has proven to be a valuable interface. It has allowed USI to inform these vendors of software irregularities with their product, thus allowing them to improve upon them.

The implementation of DCMDW-TIFF is noteworthy because it is the first time such a voluminous amount of existing employee forms was converted into electronic format with an almost flawless verification and accuracy rate. Of the approximately 740,000 documents (1.5 million pages) scanned, there was an error rate of less than 1 percent of the scanned images against the original documents. This accuracy rate is almost unprecedented for a

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project of this magnitude. The scanning and imaging technology employed by the TIFF project is second to none.

Other government agencies are considering implementing TIFF as part of their document management processes including the Department of Defense Education Agency, Defense Constructions Supply and the U.S. Air Force.

THE IMPLEMENTATION PROCESS AND METHODOLOGY

The implementation process consisted of first performing an analysis of DCMDW's current processes to determine how to utilize scanning and imaging technology to improve productivity.

The project teams consisted of a Project Manager, Programmers/Developers and Computer Specialists from both USI and DCMDW. Automation was then applied to OPF processes.

THE OVERALL TECHNOLOGICAL AND BUSINESS INNOVATION

One primary technological innovation is the fact that USI introduced workflow processes to the electronic OPF. Other systems currently in use by other agencies are for storage and retrieval only.

Another innovation is Distributed Images. DCMDW has recently deployed the OPF imaging application to all of its remote sites. The purpose of Distributed Images is to decrease response time for users viewing folders.

The access time to an employee's OPF from the El Segundo office is approximately two to three seconds. The access time to an employee's OPF from most remote sites (any site other than El Segundo) may take anywhere from thirty seconds to five minutes. With the Distributed Images solution, the application can access any OPF from any location at the rated speed of two to three seconds. This substantial decrease in access time will allow for more expeditious retrieval of employee information and provide greater strength and productivity to human resources personnel and DCMDW employees.

The current DCMDW-TIFF application has two major components: the Relational Database Management Systems (RDBMS) and the Image Server. The RDBMS stores all the index information needed to retrieve an OPF or a document within an OPF. The Image Server maintains all the files that make up an OPF.

Retrieval Time

When a remote user requests a document for viewing, the application retrieves the necessary index information from the RDBMS and then pulls the image file from the Image

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server over the network and then views the document. This process can be very time consuming (up to five minutes), especially for those employees connected to El Segundo via a slow network. This process is illustrated below:

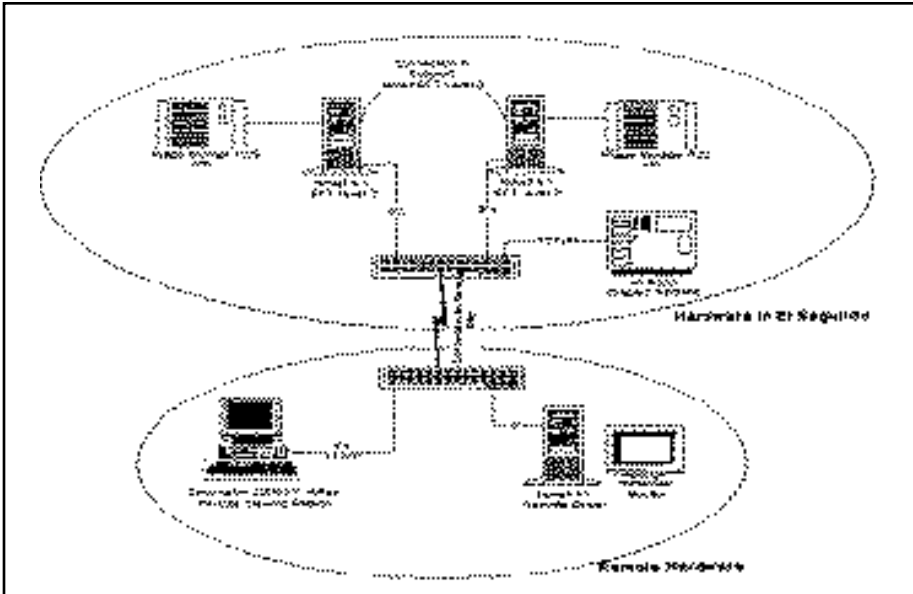


Figure 2—Distributed Images Network

System Performance Enhancement

The performance of the DCMDW-TIFF application is directly related to the time that it takes to access the images. Each image is stored as an individual file and one file can be approximately 50,000 bytes. A typical OPF can contain up to 250 pages (images) which is approximately 12,500,000 bytes. Transmission of such sizable files along with connectivity to a slow network can result in lengthy processing or “wait-time.” The Distributed Images solution will eliminate the need to transfer the folder over the network and consequently eliminate such prolonged wait time because each remote site will have a copy of their respective OPFs residing on a local server.

By supplying each remote site with their respective OPFs, the TIFF application allows these sites easy access to critical employee information and allows them to provide necessary services to their employees. This easy access along with the elimination of file transfer via a network will greatly improve system performance as illustrated below.

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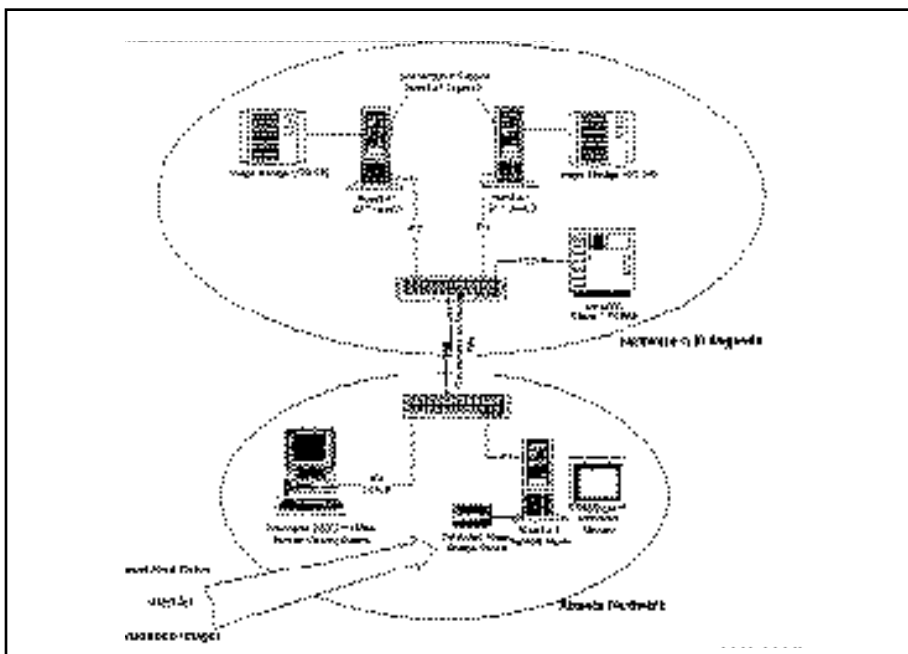


Figure 3—Distributed Images Local Storage

In addition to the above performance gain within the TIFF application, the El Segundo network will experience less network traffic. As a result, most of the client server applications (i.e. PLAS, SF52, MOCAS, cc:Mail, and others) in El Segundo will noticeably benefit from this performance boost.

WORKFLOW

The workflow process electronically moves the SF-50 to Human Resource personnel for processing. All routing, processing and notification is done entirely on-line. Notifications are done via cc:Mail. DCMDW currently uses Lotus cc:Mail as its electronic mail system, however, Documetrix 2000 is not limited to any single electronic mail system.

The following chart illustrates the complex logic that was built into the DCMDW workflow process.

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SF-50 Flow Process



Figure 4—Workflow Process

4.2 Encapsulation Sub-flow

The following sub-flow is “drilled down” from the main flow on the previous page:

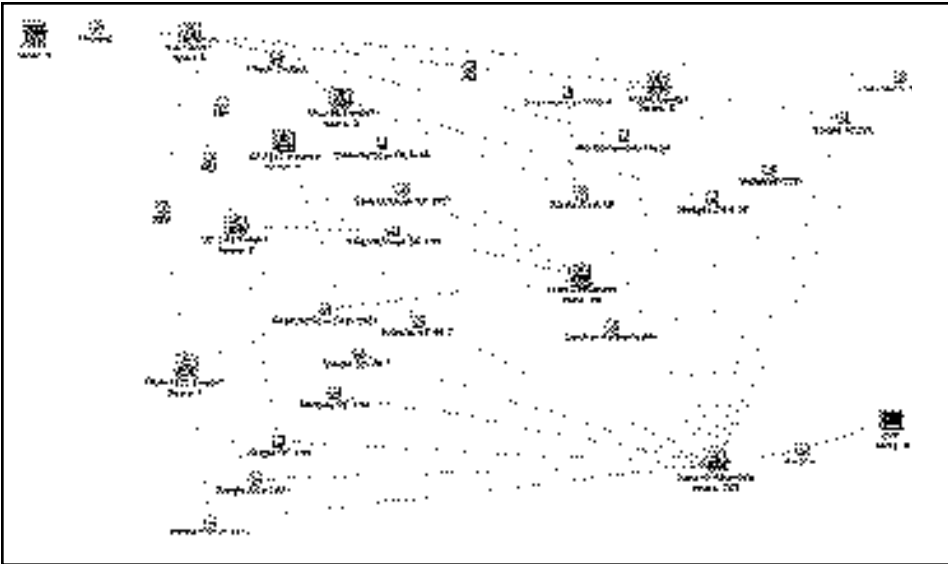


Figure 5—Detailed Workflow Process

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IMPACT

Extent and impact of demonstrated productivity improvements

Productivity improvements are clearly demonstrated through streamlined HR processes and procedures that allowed DCMDW to better serve its human resource customers. Because the system allows for immediate folder access along with concurrent usage, HR personnel are able to provide folders to employees in a timely, accurate and up-to-date manner.

Significance of cost savings, increased revenues, product enhancements, customer service or quality improvements

The \$700,000+/yr. saved can now be applied to optimizing additional business processes and creating additional efficiencies. The DCMDW-TIFF project's initial savings from reducing the physical storage requirements were critical due to the shortage of floor space within the command.

Additionally, the savings recognized from the elimination of retrieval and storage of the physical folders is secondary to the increased moral within the command due to increased response time of the Human Resources Department to the field activities. Likewise, the elimination of these tasks has resulted in higher moral and efficiency of the individuals within the Human Resources Department.

Proven strategic importance to the organization's mission

A company's business goal is better realized and achieved by the fundamental belief that you begin with an effective and efficient foundation of human resources. The DCMDW-TIFF project has effectively streamlined processes and tasks associated with employee OPFs and this has been a positive effect on Human Resource's overall mission of providing timely and accurate personnel services.

Degree to which the system enabled a culture change within the organization

The OPF imaging system allowed a gradual climate change at DCMDW by implementing a system that was designed to alleviate and not intimidate. It allowed users to migrate from the proverbial "paper shuffle" to new methods utilizing technology and an application that was friendly and intuitive. This has significantly contributed to their transition to a "paperless" environment.

DCMDW are continuing to improve the product through suggestions and requests from the client. For example, the current system manages the workflow of the SF-50

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documents, and “talks to” the separate SF-52 request system to query and compare information so that HR personnel can process SF-50 actions. The client has requested incorporation of the SF-52 application into Documetrix. In their words, “This will enhance the performances of DCMDW-TIFF and ultimately the Human Resources Business System”.

Impact of system on competitive positioning in marketplace

Since the implementation of the DCMDW TIFF system, USI has received numerous inquiries from other government agencies wishing to implement an imaging and workflow system.

Customer feedback—Success stories

“I spent approximately five months working on the Imaging of Official Personnel Folders (OPF) for my organization. In that time frame I was able to not only learn about the various forms found in an OPF, but also the process of purging, scanning, and indexing each and every page.

Throughout this process, the assistance, patience and professionalism of all the USI personnel that I came in contact with was invaluable, such as Zia, Howard, and Deric.

Today, I work with the OPFs via the TIFF on line that allows me to view, correct, verify, print or electronically mail a document found in the OPF. This has significantly reduced the time it takes for me or a Personnel Actions Clerk to go and physically “hunt” down an OPF. It was not very professional to have to inform a customer that their OPF was no where to be found or that the entire organization of more than 80 people were looking for the file.

I can now send SF-50s via the FormFlow on electronic mail and the customer can receive the document and print it in a few minutes, but always within the same day. This reduced the mass printing, correction or mailing (distribution) of the SF-50. Learning the system took time and practice, but it was user friendly.

I had a customer about four months ago that called me and said “Thank you for my SF-50! I have been away for three weeks and as I was opening my electronic mail, the first item I opened was my SF-50!” I find TIFF to be of value to the Personnel List, the customer and the entire Human Resources environment”.

Sandi A. Bennett;—Personnel Management Specialist (DCMDW)

“Let me say that I think TIFF is just great, I use it regularly and the time it saves is almost immeasurable. Considering the time it would take to hunt for an official file and may not even be able to retrieve it because it is in use elsewhere. *Easier, faster, less stressful* are a few of the words I could use to describe TIFF.

EXCELLENCE IN PRACTICE

I have a good number of actions in my area. I no longer get complaints from customers that they did not receive a copy of their SF-50, even though we know our Personnel Action Clerks did mail a copy to them.

All in all, it is timesaving and convenient, and gives me another tool to provide my customers with quick and accurate information, which certainly makes for more satisfied customers”.

Deloris Fagan—Personnel Staffing Specialist (DCMDW)