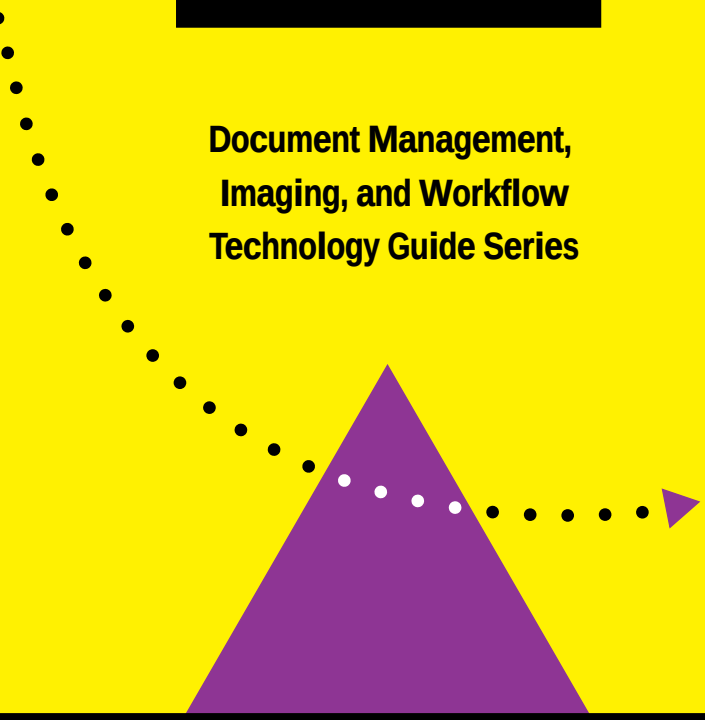
RHEINNER GUIDE

The IBM Enterprise Document Management Suite

Document Management, Imaging, and Workflow Technology Guide Series



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IBM EDMSuite is a portfolio of Web-enabled products that includes imaging, computer output to laser disk (COLD), document management and workflow.

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IBM EDMSuite provides for the storage, retrieval, and distribution of virtually all types of documents, resulting in:

- Immediate access to information
- Improved productivity
- Outstanding customer service
- Reduced cycle times
- Competitive advantage

With a single search request from a a familiar Web browser, you can retrieve images, faxes, computer generated statements, word processing documents, spreadsheets, and more, from multiple different repositories.

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The Rheinner Group

The Rheinner Group is a leading research, consulting and education firm in the document imaging, management and workflow industry. Its Certified Document Imaging Architect (CDIA) Education Program, which covers many of the same issues addressed by The Rheinner Group's Technology Guides, is the most popular training program in the imaging industry.

For more information on The Rheinner Group, CDIA course schedules, or to obtain help designing and implementing document imaging and workflow systems, please call 617-741-8100. Also, please visit our web site, The Rheinner Café, at www.rheinner.com.

The Rheinner Group is a proud sponsor of the Certified Document Imaging Architect (CDIA) certification program.

Introduction

Advances in information technology have had a dramatic and fundamental impact on business organizations. New computing platforms, distributed computer architectures, relational database platforms, telecommuting, and Internet/Intranet technologies have dramatically enhanced our ability to create, capture, compile, report and communicate information. And yet, the chasm that exists between the worlds of structured data, the data managed and stored in tabular form within existing legacy systems, client/server transaction systems, or any other database application, and unstructured data represented by document-based information such as electronic word-processed documents, customer billing statements, digitized paper documents, and paper-based correspondence and files, continues to inhibit organizations' ability to fully leverage the information managed by these technologies.

Businesses have traditionally relied on structured data for transactions, business analysis and decision-making. However, these activities have been delayed and inhibited by the inability to have full and immediate access to the documents related to that data: customer applications, correspondence, invoices, billing statements, reports, etc. Representing the vast majority of data within the organization, document-based information supports transaction processing, customer service, sales and marketing, decision support, and new product development activities. With the heightened realization that capturing and managing these business documents is crucial to success, organizations are now shifting the emphasis to unstructured data management.

In their effort to improve productivity and cost-competitiveness, companies are implementing information systems that enable them to efficiently capture, manage, process, store and distribute document-based information. However, these solutions have generally been deployed as departmental solutions to solve very specific document control problems.

For example, COLD solutions manage computer-generated reports; document imaging solutions facilitate the handling of previously paper-based information; and document management applications provide enhanced file management for computer-generated word processing files. With a range of document control problems throughout the enterprise, organizations typically have deployed a variety of these solutions, each of which has its own architecture and usage model. The end result is that while individual departments have gained more control over documents, the enterprise has been unable to leverage this control across the entire organization.

This Rheinner Group Technology Guide explores a new development in document-centric information systems, the ability to leverage information, both structured and unstructured, across the enterprise. Technology-based solutions now enable organizations to integrate these individual solutions and transparently provide information access to users across the enterprise, regardless of document format, content or location. This guide details IBM's approach to addressing both the specific information management needs of departments and the enterprise requirement to leverage knowledge assets across the organization. The guide also explains the unique benefits enterprise document management solutions can bring to specific industries and applications, such as banking, financial services and customer service.

The Need for Enterprise Information Access

The economic, competitive and technological challenges facing businesses today have forced companies to reexamine the way they work, and to redefine their work processes. To thrive and, in many cases, survive, businesses must lower operational costs, improve the productivity of the existing work force, enhance customer service, continually develop new products and services, and sharpen their ability to react quickly to changing market conditions. How well organizations meet these challenges depends on many factors—one critical factor is the organization's ability to leverage its information assets.

Obtaining relevant information, regardless of its format, content or location, and being able to easily share and communicate this knowledge base to users across the enterprise, enables organizations to become more customer-oriented, cost-competitive, nimble, and ultimately, more competitive.

Understanding Document Information

Much of the information required to meet business objectives is in the form of unstructured, or document-based information. Tens of millions of business users, empowered with personal computers, are each generating hundreds and thousands of documents per year, including contracts, letters, reports, spreadsheets, invoices, expense reports, and sales reports. Add to that the millions of handwritten and electronic documents that businesses receive from customers, suppliers and partners, and it is easy to see the magnitude of the document management challenge.

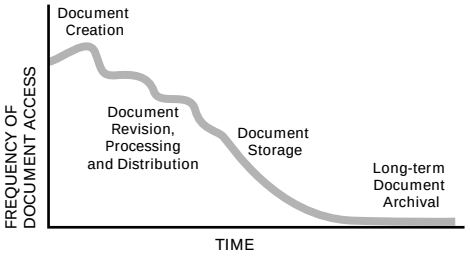
Not only is the volume of documents that businesses receive daunting, but so is the diversity of those documents. Documents come in all shapes, sizes, colors and quality. The work processes related to different types of documents vary dramatically, as well. Many documents, such as loan applications, checks and invoices trigger transactions. Other documents, such as research reports, clipped newspaper articles and competitive literature, are collected and distributed to assist in the completion of internal projects. Still other documents, such as approved loan documentation, contracts and accounting reports, must be safely stored so that they are available at a later date. Electronic document management requirements vary according to these document attributes, usage patterns and life cycles.

The Document Life Cycle

All documents have a life span that can be divided into stages of activity: document creation; active processing when the information is retrieved, routed, edited and processed; inactive processing and review when the information still must be available but is largely static; and document disposition when the information is discarded or archived.

Document management requirements change over the course of the document life cycle. During the active stages, documents are retrieved often and are typically used by several individuals within a workgroup or department. Technology solutions aimed at active document management must be optimized to retrieve information as quickly as possible and efficiently route documents to appropriate individuals for processing. As documents enter the more latent phases of their life cycle, the management focus shifts to long-term storage and information asset protection.

Figure 1: The Document Life Cycle



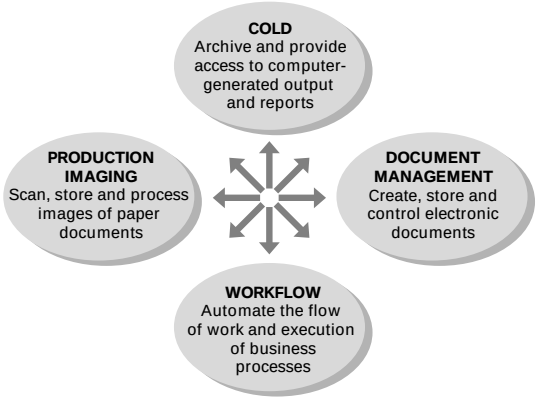
The overall duration of the life cycle, as well as each stage, varies greatly by type of document, by business process and by industry. In some industries, legal, regulatory and other business practices require a document life cycle of over 100 years. While much of that time is spent in archive, users may require access to the document at any point during that time period. In other cases, for example, the development of a product marketing campaign, document activity may be quite high for several months, after which the need to access the documents is minimal. Understanding the life cycle and usage patterns of documents within an enterprise is critical to determining specific document management requirements.

Current Generation Document Management Systems

In an attempt to improve efficiency over business operations and gain more control over the management of unstructured information, businesses have deployed a variety of technology-based solutions. Generally implemented as departmental systems to handle specific types of documents and particular document-handling problems, these systems have been based on one of several technologies, including:

- *Document Imaging* to automate the capture, indexing, management, storage and retrieval of digital images typically captured from paper sources. With document imaging technology, these images can be displayed, annotated and distributed throughout the organization, and can be stored on and retrieved from a variety of storage media.
- *Document Management* to provide for the management of multi-format documents including images as well as electronic documents created with word processing or spreadsheet applications. Document management applications tracks the location and usage of these documents, and include check-in/check-out, revision control and security functions designed to provide more control and better management of documents.
- *COLD* (Computer Output to Laser Disc) to capture, index, store and provide on-line access to reports and other data streams from host-based applications. COLD systems are generally used to capture formatted computer output, such as customer billing statements and transaction registers, that previously would be output to printed report pages and/or microfiche. COLD represents an alternate storage method that is cost-effective, and facilitates user access to the information resident in those reports.
- *Workflow* to allow organizations to define work processes in terms of participants, inputs, outputs and work flows, and to route work tasks and the information required to perform them automatically throughout the organization. Other workflow features include the ability to set rules and policies that govern the flow and fulfillment of work tasks, the ability to monitor workloads and reallocate resources accordingly, and the capability to revise the flow of work after identifying inefficiencies or bottlenecks.

Figure 2: Current-Generation Document Management Systems



Each of these systems is optimized to handle specific types of documents, manage particular stages of the document life cycle, and automate distinct work processes. As such, it is likely that organizations have implemented several or all of these technologies. And, because these solutions have often been deployed at the departmental level, it is also possible that organizations have multiple document imaging, electronic document management, COLD or workflow systems from one or several vendors.

Types of Enterprise Information Users

These technologies have been primarily aimed at one of two classes of document users:

1. *Production users* who spend the majority of their time engaged in a well-defined, line-of-business process or application, for example, claims processors in an insurance organization or accounts payable clerks. Often served by production document imaging and production workflow systems, these users generally require access to a known, limited base of documents. Production users may be involved in time-sensitive processes and may require access to a large volume of documents. In many instances, users are involved in processes that are mission critical in that they replace key paper-based operations related to financial transactions, product delivery or customer service. For these applications, system security, protection of document integrity, performance and continual document availability are the major system design points.
2. *Ad Hoc users* deal with a broader set of business objectives and applications, and thus, require access to a broader set of document libraries. Typically ad hoc users determine their own work procedures on a day-to-day and project-to-project basis, making their document access requirements varied and unpredictable. Examples of ad hoc users include product development staff, marketing and sales professionals, and human resource professionals. Ad hoc users have relied predominantly on groupware and document management solutions. However, more recently, workflow technology has evolved to support the spontaneous and dynamic work style of ad hoc users. In some instances, ad hoc users require access to document sources external to the enterprise, for example Internet-based information.

There is yet another constituency of enterprise document users, comprised of an organization's customers, partners, and suppliers. These *"external users"* have been indirectly served by some of the document management technologies described earlier. For example, many document imaging and COLD systems support customer service applications designed to improve an organization's ability to respond to a customer's request for information. However, as organizations continue to deploy document systems technologies to improve customer service and enhance

competitive positioning, and as Internet technologies evolve, external users will increasingly access corporate document systems directly. This method of customer "self-service" is cost-effective and can dramatically improve the delivery of high-quality service.

Depending on the application, the needs of these users can parallel either the production or the ad hoc user world. In certain situations, external users will access very-limited documents from limited sources, for example, customer account information. In addition, available processing choices are likely to be limited. In other cases, a key business-to-business account might require broad and diverse access to internal document libraries, such as a parts catalog or inventory system. External user applications do, however, share two requirements:

- the user interface must be intuitive and accessible to individuals with a range of computer familiarity and literacy;
- system security is critical. Organizations must insure that external users be authorized to access these systems, and that they only have access to appropriate document information.

The Challenge: Leveraging Information Assets Across the Enterprise

To serve these diverse constituencies requires a solution that addresses specific departmental document management requirements while simultaneously providing transparent access to document information across the enterprise. From an architectural standpoint, the solution must:

- include a common user interface,
- provide access to multiple data sources,
- offer the flexibility to support growth and enhancement.

To meet the needs of the enterprise requires a standard, simplified, consistent interface so that users throughout the organization can easily request and access information needed for cross-functional and multiple business purposes. To be effective, the architecture must support seamless access to both enterprise-wide and inter-enterprise document sources. To that end, the needs of production, ad hoc, and external users must be accommodated with the solution. For certain applications, this interface must be customized to deliver optimal retrieval and processing performance. For general office applications, access to these multiple repositories, including Internet and Intranet sources, should be provided via standard desktop interfaces and Web browsers.

Transparent and efficient access to all document information, regardless of its type or location, is critical to the delivery of enterprise-wide document management. The most-successful enterprise document management solutions will capitalize on, rather than obsolete, existing document management solutions. By providing access to documents located in a variety of document repositories from a range of vendors, organizations will be able to protect the investments they have already made in document management solutions. In addition, this approach enables organizations to deploy enterprise document management solutions in an evolutionary timeframe driven by corporate and customer requirements.

Finally, just as past investments in individual document management solutions should be protected, organizations will continue to leverage information assets by selecting solutions that best meet their specific

needs. Enterprise document management should not lock users into yet another proprietary architecture and usage model. What is required is an open approach that enables the integration and addition of module-based applications and subsystems that share a common architecture and application services. Users should be able to implement the individual component that best addresses a specific business problem, confident that as other components are added, they will be able to work with each other.

IBM's Response: The Enterprise Document Management Suite (EDMSuite)

IBM has been a major provider of document management technology since its introduction of the ImagePlus document imaging management solution in the 1980s. Since then, IBM has expanded its offerings to include solutions for COLD and workflow. Its acquisition of Lotus enabled it to round out this portfolio with Lotus Notes, and the recently announced Domino.Doc document management environment.

Rather than a "one-size-fits-all" approach, IBM's enterprise document management strategy is to continue to provide a suite of products that, while individually optimized for specific user requirements, are also capable of being integrated to provide enterprise access to the documents contained in each repository in a way most suitable to the user's work style.

Components of the EDMSuite include:

ImagePlus

ImagePlus VisualInfo, a distributed and scalable client/server solution, enables the management and storage of a broad array of document types, such as document images, graphics, spreadsheets, text, audio and video. The VisualInfo client application, which runs under OS/2, Windows 3.1, Windows 95 and Windows NT, manages document capture from scanners, fax machines or other applications as well as document retrieval and viewing. Client-based application programming interfaces (APIs) can be used to tightly integrate VisualInfo client services with existing line-of-business applications, such as accounts payable or claims processing systems.

The VisualInfo library server stores the indexing and retrieval information assigned to each document, and fulfills requests made by system users. The documents themselves are stored on one or more object servers. Servers can be configured on OS/2, AIX or MVS/ESA platforms; an NT version of the VisualInfo library server is currently in beta and scheduled for delivery in the second half of 1997. Systems can be created with a single LAN server, multiple LAN servers, MVS/ESA servers, or a combination, providing configuration options for a broad range of application and user environments.

ImagePlus for AS/400 is a function-rich, mid-range solution for complementing AS/400 applications that support single to multiple departments. There are over 2,000 installations of ImagePlus for AS/400 in over 20 industries worldwide.

ImagePlus for MVS/ESA is for high-volume transaction environments. A complete solution, ImagePlus for MVS/ESA is successfully meeting the needs of large organizations that process hundreds of thousands of documents per day and track millions of documents across the enterprise.

OnDemand

Designed to manage large volumes of computer-generated information, such as invoices, customer

statements and management reports, the OnDemand family electronically archives data that was previously stored on paper printouts or printed to microfiche. OnDemand automatically captures documents from the application in which they were created, or from spool, tape or other source. The OnDemand system automatically extracts index information, such as the customer name and account number, to facilitate quick and easy access to data stored in the system. OnDemand supports both text-based and graphical interface-based user retrieval, with features designed to minimize search time and the need to browse through unneeded data.

The OnDemand archive program manages data storage across magnetic, tape and optical devices so that cost-effective access and long-term archival of report data is achieved. For example, customer statements might be stored on magnetic media for the first month after their creation when personnel need frequent and immediate access to this data, after which they could be moved to an optical device for an interim period of a few months when access requirements become more occasional. Finally, the data could be moved out of the system (either on tape or on optical disk) for off-line storage once retrieval activity becomes infrequent.

The OnDemand administration system enables the user to define multiple report types and security levels. In addition, the administration module allows the user to set storage migration parameters and storage device collection characteristics.

The OnDemand family includes OnDemand for AIX, and the Report/Data Archive and Retrieval System (R/DARS) for MVS/ESA and AS/400. OnDemand for Windows NT is planned for the second half of 1997.

FlowMark

IBM's workflow management module, FlowMark, provides a graphical tool to define the overall flow of a process, as well as the specific activities, people, information and system tools involved in the process. The FlowMark workflow engine then manages the flow of work so that pending tasks are delivered to the appropriate user's workstation in the form of a worklist. The worklist contains information about each work item, such as activity-name, description, priority or due date. When a user selects an item from the work list, FlowMark automatically opens the application associated with the activity and can automatically pass required data to that application. FlowMark can launch a full range of applications—from mainframe applications to desktop applications. In addition, FlowMark is tightly integrated with Lotus Notes, enabling FlowMark's structured workflow to be linked with the collaborative workflow capabilities of Lotus Notes.

A FlowMark runtime client for Lotus Notes enables Notes users to integrate the more-structured workflow capabilities of FlowMark with the ad-hoc features of the Notes product. FlowMark work items are presented as documents in a Notes database, and users can also create custom views of FlowMark work items. The FlowMark Notes client supports all standard Notes features, such as searching, sorting, ad hoc routing, and disconnected support—the ability to work on items remotely without being connected to the LAN.

In addition, World Wide Web users can link to FlowMark business processes via the IBM Internet Connection for FlowMark. Using familiar Web-browser technology, users can access FlowMark business processes through the WWW/FlowMark process initiation. Through WWW/FlowMark worklist integration, FlowMark work items and processes are integrated into the Web environment.

Using the Internet Connection products, a customer browsing the Web, for example, can submit a request for an insurance quote by filling out a standard HTML form. The submission of this form could then initiate the appropriate process on the FlowMark server to process and deliver the quote. Another example: remote sales people can use standard Web browsers to access a FlowMark worklist at headquarters. By using standard Web browser technology, the sales person needs no additional FlowMark code running on his local machine.

Domino.Doc

Recently announced, Domino.Doc is a Web-based document and content management solution that allows organizations to capture, file, retrieve and distribute content across the Internet using desktop applications, Web browsers, or any Lotus Notes client. Built on Lotus' Domino internet server technology, Domino.Doc combines the directory services, security, replication, and full text search capabilities found in the Domino infrastructure with traditional document management features, such as check-in/check-out, version control, document profiling and audit trails of document access.

Domino.Doc accepts electronic documents from any Windows application that is compliant with the Open Document Management API (ODMA) standard, as well as scanned or faxed pages, Web pages, and audio and video clips. Once captured and translated into HTTP files, the documents are stored in the Domino.Doc repository, a filing cabinet-based storage paradigm with file rooms, cabinets and folders. At this point, the author can specify a document's characteristics, extend access privileges, set review and approval parameters and specify rules on ownership and storage. This information is used to manage the document and initiate any document distribution, review and approval activities.

A Modular Standards-Based Architecture

IBM's EDMSuite architecture is an open, standards-based design that allows customers to pick and choose the document management applications, subsystems, search engines and components best suited to their specific business needs. Built around IBM's DB2 database, EDMSuite products will be available on Windows NT by the end of 1997, with full support for Microsoft BackOffice. In addition, all components will provide ActiveX controls for the Windows platform with JavaBeans as the chosen open, cross-platform component standard.

Integration Levels to Suit Usage Patterns

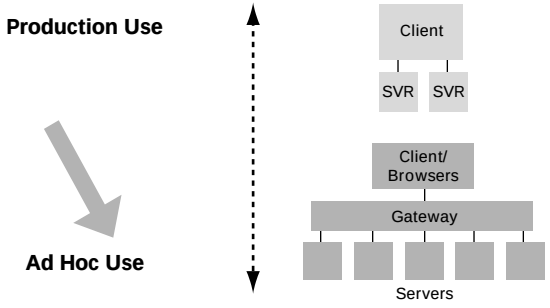
The EDMSuite architecture supports multiple levels of integration to diverse document repositories. For the broadest, occasional and most flexible document access requirements, IBM's Gateway Integration allows users to access multiple document repositories using standard Web browsers. For more frequent and predictable access to document repositories, the EDMSuite supports client-level integration.

The Gateway Approach

With IBM's web-server gateway component, users request documents by entering search criteria into a web-based browser interface. These criteria are sent via CGI (Common Gateway Interface) scripts to one of several selectable search engines, which performs the search across multiple document repositories, whether they hold COLD documents, document images, electronic documents, Notes documents, Domino.Doc documents, or data from traditional databases and legacy applications. A sophisticated multi-search capability transforms a single query into multiple search requests that are routed to different servers. The gateway server than combines the results of the

individual searches into a single view, which is presented to the user as a list of possible document matches. The user then selects the appropriate document(s) for viewing or printing.

Figure 3: The Gateway Approach to Enterprise Document Access



Providing maximum access flexibility, the gateway approach allows users to access enterprise document information using standard web browsers, and to receive these documents via the Internet, Intranets or Extranets. Published APIs will enable the integration of additional document servers.

With the gateway integration approach, document access and security can be implemented in one of several ways:

- establishing corporate fire walls between different document servers,
- configuring the system so that users of certain authority levels are connected to specific gateways,
- configuring the system so that user authorization is performed at the gateway level,
- configuring the system so that user authorization is controlled by the individual document management application.

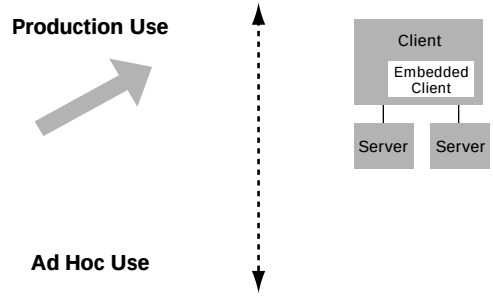
The Embedded Client Approach

For production users who need to repeatedly access a small number of document repositories, the embedded client approach maintains the full functionality of the client application, while enabling access to additional document repositories. In this approach, the functionality of one or more clients of other document management solutions are embedded within the user's primary client environment. Each client appli-cation than accesses document data from its respective server. After retrieving document information from its server, the embedded client passes the data over to the primary client for document display and manipulation.

For example, users in the accounting department of an organization may need frequent and repeated access to documents stored in the COLD repository as well as document images stored by the VisualInfo system. The embedded client approach provides these users with high-performance document access within the context of their familiar desktop application, whether it is OnDemand or ImagePlus.

With the client integration approach, document security and access is controlled by the individual solutions, just as they would be if each client were independently handling the request. Custom integration of other solutions is available through client APIs.

Figure 4: The Client Approach to Repository Document Integration



The design can be extended to accommodate embedding both additional client functionality and web-browser functionality into the primary client interface. This would enable the user to access repositories via either the client or the gateway approach. For users with production and ad hoc activities, this approach offers broadest access and highest performance.

Enterprise Document Management: Industry Usage Models

While all industries can benefit from implementing departmental and enterprise-wide document management solutions, for certain document-centric industries, such as banking, financial services and insurance, redesigning their document-based business processes is essential to the competitive viability. In general, companies in these industries handle a far greater volume of documents than their counterparts in other industries. Often, these documents are related to business processes critical to the core operation of the business. Examples include the processing of checks and new loan applications in the banking industry, and policy underwriting and claims processing in the insurance industry.

Financial Services

Banks and other financial service institutions are currently confronted with a number of significant and interrelated market dynamics: deregulation, increased competition from existing and new players, industry consolidation, geographical expansion, and heightened consumer demand for new products, improved levels of services and lower costs. To survive in the new world order brought on by these forces, financial service companies have been forced to restructure their administrative, operational and informational infrastructures to lower costs, improve customer service and reduce the time it takes to develop new products. Document management technologies, individually and collectively, represent a critical element in this competitive transformation.

Document and work management technologies are being used in virtually every segment of the financial services industry for a growing list of operations, including:

- *retail banking*—new account documentation and set up, signature verification, image statements, customer service;
- *lending operations*—consumer, commercial and mortgage loan origination, processing and servicing;
- *credit card operations*—application processing, payment processing, image statements, customer service;
- *treasury operations*—lockbox, item processing;
- *investment service operations*—new investment accounts set up and maintenance, redemption and disbursement management;

Financial service companies are also utilizing document and work management technologies for a range of internal support applications, such as accounting, purchasing, human resources, regulatory compliance and new product development.

With such a broad range of document types, volumes and characteristics to manage, and with an equally diverse set of application requirements, financial service companies have looked to a variety of solutions to automate their document control and processing

activities. Production imaging systems are used to store and retrieve the large volumes of documents associated with accounts, applications and payments. Workflow systems automate the processing of many financial applications, such as loan origination and payment processing. COLD systems manage the tens of thousands of report pages and hundreds of thousands of statements and invoices that are generated by financial departments each week and month. Electronic document management applications control the many word processing and spreadsheet documents used throughout support departments in the organization.

While these solutions have provided numerous cost, productivity and competitive benefits to the financial industry, many organizations are now attempting to gain further advantage by providing enterprise-wide access to the document information collected in each system. To date, however, this has been problematic. These distinct solutions, which have often been evaluated, selected and implemented at the department or divisional level of the company, generally have been supplied by a number of different vendors. In addition, they may run on different information system platforms and be built around a range of system architectures. This problem is compounded by the merger and acquisition activity that has characterized the financial services industry. In this event, not only do financial service companies need to integrate their own disparate systems, but those of another organization as well.

The answer is an enterprise document management solution that leverages the document information already captured and contained in each individual solution across the enterprise by providing transparent access to all users in a manner that is consistent with their work style. For a customer service representative, this may means being able to access loan documents stored in a document image database, or a page from a computer report located in a COLD system. For example, document imaging and workflow technology can dramatically reduce the time it takes a bank to approve new loans by automating the steps involved in document collection, allowing simultaneous completion of loan processing steps, and by routing all relevant information to the appropriate individuals and/or departments once all documentation is complete. This folder of document information, however, can also be useful to the customer service department charged with servicing the loan once it is established. While not requiring continual access to the imaging and workflow application, the customer service staff benefits from easily accessing this document repository to review loan activity and answer customer inquiries.

Consider the example of an investment sales professional who tracks prospect and customer activity using Lotus Notes. That individual should be able to access relevant customer information that may be collected within an account servicing workflow application in another department. With the IBM EDMSuite, the sales person can access the workflow document repository or a work list pertaining to certain customers through his Lotus Notes desktop without running the workflow application at his workstation. Alternatively, that sales person may work out of a branch office and need to access document information located in the home office. Using a Web browser and the IBM EDMSuite Gateway, it's possible for him to access the same document information.

Web-enabled document management technologies can be used to strengthen the customer bond and enhance service delivery as well. High-value customers, for example, can be provided access to account information, check images, or investment documentation via standard Web browsers.

Insurance

Paper problems have plagued the insurance industry for many years, to such an extent that insurance companies were among the earliest adopters of document image systems. Before imaging, many insurance applications such as policy underwriting, policy servicing and claims processing, were paper-based. While personnel typically relied on mainframe applications for supporting customer information, the processing of work followed the manila customer claim file as it moved between individuals and departments before resolution. Handling, distributing, processing and storing these files was slow, expensive, and prone to error. Initially these systems provided cost-effective storage and retrieval of the many documents associated with insurance policies. Gradually, workflow systems evolved to handle claims processing and policyholder servicing.

Document management technologies have enabled insurance companies to reduce or eliminate paper handling, streamline business procedures, and deliver better customer service by providing more efficient access to relevant information. An enterprise approach to document management offers even more compelling benefits by enabling personnel to easily access document information related to underwriting, claims, policy servicing and sales.

Enterprise document access enables insurance company personnel to be more productive and make better business decisions. For example, a claims processor at a production imaging workstation requires access to policy information on the COLD system. Or the finance, actuarial and underwriting departments can perform more comprehensive analysis and make better decisions by accessing COLD documents and information located within a document imaging repository, along with spreadsheets on their desktop. With IBM's EDMSuite, there are numerous ways to provide this access. A VisualInfo document imaging client can be embedded within an OnDemand COLD client to provide full functionality of both applications. Alternatively, users can utilize Web browsers to retrieve documents from any one of a number of document repositories.

With the capabilities of enterprise document management, some insurance organizations are revolutionizing the way they do business by eliminating departmental boundaries between underwriting, policy servicing and claims payments. Instead, these companies have reorganized into "work teams" that are responsible for servicing all the insurance needs of a particular group of customers during the entire life cycle of the policy. Providing better service to customers, this team approach is only possible with an integrated document management strategy that spans the enterprise.

Internet/Intranet technologies can also be used to enable enterprise-wide document management within the insurance industry. Consider the number of insurance companies that rely on a huge network of independent sales agents to write new business. Using web browsers and Intranets, agents can tap into corporate document repositories to gather information on prospects in their area or obtain information on new products and services. Similarly, customers could request insurance information by filling out a Web-based form on the Internet. When submitted, the form could then initiate a workflow application to generate a customized quote, which could then be routed back to the customer via the Internet.

Customer Service

Beyond the vertical industries of financial services and insurance, there is one additional application for enterprise document management that offers universal benefit to virtually all companies and all industries: customer service. For most organizations, it is easy to justify investments in improving the delivery of customer

service. Not only is enhanced customer service a way to win the hearts and dollars of the customer, it is also a major cost center for most operations.

The resolution of customer service problems often crosses functional areas of an organization, requiring the involvement of several individuals and access to multiple pieces of information. Without the assistance of document management technology, resolving a customer issue can be a lengthy process: The customer service representative charged with solving the problem needs to call several individuals, track down or request needed documents that may be distributed among different departments, wait for return phone calls and information, and finally resolve the problem by placing a call or writing a letter to the anxious customer.

With electronic access to all the required documents, the resolution process can be streamlined dramatically, which benefits both the customer and the organization. Resolving the issue with a minimum of internal involvement and customer call backs saves the company money and leaves the customer with a positive impression of the organization. If, when receiving an inquiry, a customer service representative can easily access the multiple repositories where relevant documents are stored, there is a higher likelihood that the issue can be resolved immediately—perhaps while the customer is still on the phone. If resolving the problem requires the involvement of more than one individual or department, electronic copies of all the supporting documentation can be simultaneously forwarded to these parties, regardless of whether they are supported by the specific applications that manages the various documents. In either event, customer issues are resolved more efficiently than they could be without benefit of enterprise access to the information.

The nature of customer service operations can vary dramatically, even within the same organization. Some customer service inquiries are very predictable. Customers call with a finite set of questions to which there are a limited number of possible responses. Customer service representatives may need to access only a customer database, or a specific page in a manual, or a particular set of documents. These customer service applications are characterized by their repeated, predictable nature. For these applications, tightly-controlled scripts and interfaces to appropriate document sources, as well as automated and electronic availability of "form letters" that are delivered to the customer, enable prompt and cost-effective issue resolution.

Alternatively, the unpredictable nature of customer inquiries in some organizations requires that knowledgeable professionals have access to a wide range of document and information sources as they determine how best to address each inquiry. These customer service professionals, who are likely to work with a number of desktop applications or who might be Notes users, require a flexible way to access documents that might reside on an imaging object server, in a COLD repository, or on the Web.

Finally, some customer service activities require an approach that combines both production-oriented and ad hoc document access. Perhaps a majority of customer inquiries can be handled according to a pre-defined approach, while the remainder must be handled in a highly-individualized manner. In this situation, the "exceptional" cases can be delivered out of a production-oriented solution to users who then resolve the cases in an ad hoc manner by accessing a variety of document and data sources.

Summary

Virtually all industries face competitive and economic conditions that dictate the need for improved management of document-centric work processes and expanded access to document-based information. However, within an enterprise document control problems vary dramatically. Some departments must rein in a huge volume of paper-based information that has stymied its ability to efficiently perform work; others must redesign outdated document processing activities; still others face the challenge of better managing the collaborative project work built around electronic and paper-based documents.

For most organizations, no single application solution is capable of addressing these diverse user needs and application requirements. Yet, individualized systems are often disconnected from each other, preventing organizations from leveraging the document information resident in each system across the enterprise. The solution is a set of individualized applications that are optimized to handle specific types of documents and work procedures, but also are capable of distributing information to users not directly supported by the application.

By providing for the capture, management, storage, retrieval and distribution of virtually all types of document information, IBM's EDMSuite provides organizations with numerous benefits, including:

- improved productivity and reduced costs of operation,
- higher levels of customer service,
- reduced cycle time for business transactions,
- lower cost of operations,

Beyond these benefits lies an even larger opportunity to not just gain control of documents, but to exploit the information resident in these documents. By providing users with all the information relevant to a customer, account or event, regardless of its content, format or location, IBM's enterprise document management solutions enable organizations to leverage document information toward competitive advantage. With information from disparate sources collected, integrated and delivered to a familiar desktop interface, such as a document management application, a standard desktop interface or a Web browser, organizations can empower their employees, customers, partners and suppliers. At that point, it is possible for organizations to leverage document information into the ability to make better-informed decisions, create new products and services, develop new delivery vehicles for products and services, and become more responsive to changes in the marketplace.

Case Study: BASF Innovates Human Resources' Records Management Process

The Organization

Best known in the U.S. for its audio and video tapes, BASF is the world's second-largest chemical manufacturer. Founded in Germany in 1861, the company's operations include oil and gas, chemicals, agricultural products, plastics and fibers, dyestuffs and finishing products, and consumer products. The company employs more than 106,000 people, located in 39 countries. BASF produces more than 8,000 different products and holds a 50 percent share in more than 90 other companies. The BASF Group reported 1995 sales of 46,299 million DM.

Acquisitions into related businesses have figured prominently in BASF's global expansion and diversification. BASF has been an industry leader. The company became a leading plastics and synthetic-fiber manufacturer by moving away from coal-based products and into petrochemicals. In the late 1950's, BASF began joint ventures abroad, including one in the U.S. with Dow Chemical (BASF bought out Dow's half in 1978). BASF bought Mobil's polystyrene-resin business in 1992, providing almost a 10 percent share of the U.S. market. Two years later. BASF's purchase of Imperial Chemical made it Europe's second-largest producer of polypropylene. The company continues to expand in related industries around the world.

In addition to a strategic acquisition strategy, BASF owes much of its success to innovation. One of BASF's latest innovations is an exciting project being developed for its Human Resources (HR) department at its headquarters in Ludwigshafen, Germany.

The Project

The Personal Folders project, initiated in 1994 and scheduled to be completed by 2000, will give HR managers immediate and simultaneous access to more than 50,000 personal folders. Each employee folder contains from 20 to 200 pages. This project will allow BASF to replace paper files and to support its current hard copy (paper) flow of personnel files. In addition to providing faster access current employee files, this new process will make it possible for the staff at multiple locations to access to the same files simultaneously. A total of six BASF employees and consultants from the consulting firm MBG mbH worked for over a year on the project prototype, linking IBM's ImagePlus VisualInfo client/server image-management system and Lotus Notes software in an SAP R/3 environment.

In the pilot program, VisualInfo stores the large quantities of documents in a central archive and makes them available to SAP R/3 users in seconds. Lotus Notes acts as the transport system, linking the information from VisualInfo to the Lotus Notes desktop. Although all information will be stored in the VisualInfo system and in SQL databases, the integration of business management processes will be transparent to the user.

The Experience

"Ease of integration was a prime consideration in the Personal Folders project," said Peter Reinhardt, BASF Project Manager. "While there were some surprises, just as there are on any project, we have successfully demonstrated that IBM's ImagePlus VisualInfo is the premier integrated archiving solution for our environment."

Project Personal Folder capitalizes on the electronic archiving advantages in the SAP environment through the attachment of IBM's ImagePlus VisualInfo archiving system. This project conclusively proves the interoperability and functionality of VisualInfo as an effective archive server, SAP R/3 as an HR business application system, and Lotus Notes as an information link. "We integrated these products easily, convincing us that each product was built with interoperability in mind," said Peter Reinhardt.

The Future

The practical advantages of this new approach for records management in HR departments include:

- *Increased Flexibility*—With proper passwords, personnel files can be accessed form any PC desktop.
- *Improved Productivity*—Multiple users can access the same personnel file simultaneously, and transfer files between locations.

- *Complete Accuracy*—New information added to personnel files will be available immediately, thus improving accuracy and ensuring up-to-date records at all times.
- *Ease-of-Use*—When combined with Lotus Notes, users can attach e-mail notes to personnel files.

Dr. Werenfried Wendler, Human Resources Manager for BASF AG, said, "IBM's client/server image-management system simplifies the management of BASF's Personal Folders. Information from the on-line archive is immediately available. The Personal Folders project, using IBM's ImagePlus VisualInfo and Lotus Notes software in the SAP R/3 environment, will enable us to reengineer our business processes."

Glossary

Analog—Comes from the word analogous, meaning "similar to." Analog devices record or monitor real world happenings, motion and sound, for instance, and convert them into "analogous" electronic representations, i.e. film or audio tape. Analog means recreating the continuous nature of the original thing. It is the opposite of digital, which translates the original happening into ones and zeros—an "unanalogous" representation.

Application framework—Application frameworks are sets of objects that provide packaged functionality and programming interfaces to accomplish specific tasks.

Application Program Interface (API)—Generic term for any language and format used by one program to help it communicate with another program. Specifically, an imaging vendor can provide an API that enables programmers to repackage or recombine parts of the vendor's imaging system, or integrate the imaging systems with other applications, or to customize the user interface to the imaging system.

Architecture—Refers to the way a system is designed and how the components are connected with each other. There are computer architectures, network architectures and software architectures.

Audit trail—Record of activity that has occurred in a certain file, or on a certain computer.

Authorization code—Identifying code, often a password, that allows a user access to a system. Used mainly for privacy and security. Also used to divide up a computer's capacity among departments and/or hierarchies; different "grades of service" are given different authorization codes.

Backfile conversion—The process of scanning in, indexing and storing a large backlog of documents on an imaging system.

Backup—A duplicate copy of data placed in a separate, safe "place"—electronic storage, on a tape, on a disk in a vault—to guard against total loss in the event the original data somehow becomes inaccessible. Generally for short-term safety.

Batch processing—Conducting a group of computer tasks at one time, instead of steadily throughout the day.

Bit-mapped image—Representation of image data where each pixel has a corresponding memory element.

Business Process Automation—The use of computer-based information technology (specifically workflow technology) to automate the steps in a business process, coordinate the assignment and distribution of work items and information among individuals, and manage the completion of tasks, activities and ultimately business processes.

Business Process Redesign (BPR)—The review, evaluation and redefinition of the tasks and activities that comprise a business process. The objective of BPR is to develop more efficient business processes.

Business Process Reengineering (BPR)—The radical restructuring of the business processes, organizational boundaries, and management systems of an organization. Business process redesign and business process automation are components of BPR.

Cache—Small portion of high-speed memory used for temporary storage of frequently used data. Reduces the time it would take to access the data, since it no longer has to be retrieved from the disk.

Case—An individual instance of work to be performed for a a business process; it can consist of one or more folders, documents and forms.

Compression—A software or hardware process that "shrinks" images so they occupy less storage space, and can be transmitted faster and easier. Generally accomplished by removing the bits that define blank spaces and other redundant data, and replacing them with a smaller algorithm that represents the removed bits.

Computer Output to Laser Disk (COLD)—Technique used to transfer computer-generated output to optical disk.

Controller—A hardware/software device that facilitates communications between a host and one or more devices.

Database Management System (DBMS)—Set of programs designed to organize, store and retrieve machine-readable information from a computer-maintained database or data bank.

Decompress—To reverse the procedure conducted by compression software, and thereby return compressed data to its original size and condition.

Descriptor—The key word, code or phrase that an automated document retrieval system uses to identify and locate the document. Descriptors sometimes "summarize" the most relevant data in the document, so that reading the descriptors—rather than retrieving the entire document—is sometimes sufficient for the purposes of the search.

Desktop—Slang for any computer function that can be done on a standalone PC, rather than a larger, more powerful, computer.

Device drivers—Programs that tell the computer how to communicate with particular peripheral devices.

Digitization—Use of a scanner to convert documents (on paper or microfilms) to digitally coded electronic images suitable for magnetic or optical storage.

Direct Access Storage Device (DASD)—Any on-line data storage device. A disc, drive or CD-ROM player that can be addressed is a DASD.

Dots per inch (dpi)—A measurement of resolution and quality. Measures the number of dots a printer can print per inch both horizontally and vertically. A 600 dpi printer can print 360,000 (600 by 600) dots on one square inch of paper. More dpi means higher resolution and greater detail.

Field—The smallest logically distinguished unit of data in a record. In a database, the individual items of related information, for example, policyholder's name, address, social security number, etc. "Logically distinguished" means that there are similar units of data in other records that have something in common. For example, "last name" is a field, an entire mailing address is a record. All of the address records is a database.

File—All the data that describes one document or image, maintained under a single naming code and stored in a computer or in a storage medium.

File server—Local Area Network (LANs) were invented to allow users on the LAN to share and thereby conserve the cost of peripherals (printers, modems, scanners) and to likewise share software. The file server is the machine on the LAN where the shared software is stored.

Folder—(1) A term for the basic element in its file management scheme. A folder holds sets of directories. A folder can hold other folders. It is basically a hierarchical tree-directory scheme, just like DOS's directories and sub-directories. (2) A logical collection of electronic documents stored on the document management system.

Gigabyte (GB)—A million (actually more) bytes of data, or a thousand megabytes. Imaging applications commonly take up huge amounts of data. For example, it only takes ten 8½- by 11-inch color pictures, scanned at 600 dpi, to fill a gigabyte.

Graphical User Interface (GUI)—Computer control system that allows the user to command the computer by "pointing-and-clicking," usually with a mouse, to pictures or "icons," rather than typing in commands.

Gray scale—The spectrum, or range of shades of black an image has. Scanners' and terminals' gray scales are determined by the number of gray shades, or steps , they can recognize and reproduce. A scanner that can only see a gray sale of 16 will not produce as accurate an image as one that distinguishes a gray scale of 256.

High resolution (Hi-res)—Basically, any image that is displayed in better quality by increasing the number of dots, or pixels per inch than normal. Usually refers to better quality computer displays, but can describe printer quality as well.

Hot swap—A method used to remove or replace hardware system components while the system remains powered on and operating. Subsystem activity is not significantly affected while the host swap is in progress.

Image resolution—The fineness or coarseness of an image as it was digitized, measured as dots-per-inch (dpi), typically from 200 to 400 dpi.

Imaging—Recording "human-readable" image—pictures, images, motion, text, etc., into "machine-readable" formats, i.e. microfilm, computer data, videotape, OCR output, ASCII code, etc.

Imaging system—Collection of units that work together to capture and recreate images. At its simplest, it has an acquisition device (scanner, camera), an image processor and an imaging device (printer, microfilm, computer).

Index—A descriptive set of data associated with a document for locating the document's storage location. In a more complex and demanding role, indexing can be used to consolidate documents that may not be, at first glance, related, or that may be stored in different locations, or on different media. Indexing stored documents is the great intellectual challenge in document retrieval. Anyone can scan a piece of paper to microfilm. The hard part is devising an indexing scheme that describes every possible parameter of each document for later searches, comparisons and processing.

Intelligent Character Recognition (ICR)—Advanced form of OCR technology that may include capabilities such as learning fonts during processing or using context to strengthen probabilities of correct recognition.

Interface—An interface is simply a mechanism for different pieces of software to interact. For instance, application programming interfaces (APIs) are provided with operating systems to access system-level services from programming languages; database management systems to access SQL database services; and any number of other types of applications and system software.

Key—A word, number or phrase associated with a document to aid in its retrieval from storage. Sometimes called descriptors. There are often many keys used together to fully locate a document; together they are called an index.

Keyword—A word associated with a document or document image to aid in its retrieval from storage.

Kilobyte (Kbyte)—One thousand bytes. To a computer, it is actually 1,024. So 16 Kbytes, or 16K is actually 16,384 bytes, 64K is 65,536, etc.

Local Area Network (LAN)—Data communication network of connected devices within a small area, such as a building or group of buildings. High-speed transmissions over twisted pair, coax, or fiber optic cables that connect terminals, personal computers, mainframe computers, and peripherals together at distances of about 1 mile or less.

MAPI (Messaging API)—A Microsoft published API that separates the client from the server functionality, allowing various clients, like mail front ends, word processors, spreadsheets, etc, to access the messaging capabilities of back-end mail servers, such as Microsoft Exchange Server.

Megabyte (MB)—Approximately one million bytes. Precisely 1,024 kilobytes, or 1,048,576 bytes.

Megahertz (MHz)—One million cycles per second.

Memory—Area of a computer system that accepts, holds, and provides access to information and data.

Near-line—Data that is available on a secondary storage device that the user can access, but at a slower rate the on-line data is accessed.

Node—A point of connection into a network. In multipoint networks, it means it is a unit that is polled. In LANs, it is a device on the ring. In packet switched networks, it is one of the many packet switches which form the network's backbone.

Object-Oriented Program (OOP)—Programming that views programs as a collection of autonomous agents called objects. Each object is responsible for specific tasks.

Off-line—Data that is not physically stored on an accessible drive, such as removable tapes or disks.

OLE—OLE is a set of system services that provides a means for applications to interact and interoperate. Through OLE Automation, an application can dynamically identify and use the services of other applications. Applications that accept objects from other

applications are called containers, while the application providing the object is called a server. Through OLE object linking, objects created in one application can be linked into container applications. As the linked object is changed or revised by the server application, it is automatically updated in any container applications. Through OLE object embedding the container application does not maintain a link to the object's data source, so updates to an embedded object must be made from within the document itself. Through OLE Visual Editing, embedded and linked objects can be directly edited within the container application without switching to the server applications.

On-line—Data that is available on a primary storage device so that it is accessible to the user.

On-line spare drive—Remains idle until one of the drives in the array fails, at which time it replaces the failed drive. The data that was on the failed drive is then recreated on the on-line spare utilizing the data and or parity values on the remaining two drives.

OpenDoc—OpenDoc is a specification for a compound document architecture that is being formed by the joining of several different technologies supplied by Apple (the base OpenDoc architecture, the Bento file system and the Open Scripting Architecture) and IBM (the System Object Model). The development effort for combining these technologies has been divided among key consortia members, including Apple, IBM, WordPerfect and Novell. To date, the OpenDoc software is not available on any platform. Unlike OLE, OpenDoc does not allow the integration of shrink-wrapped applications and components.

Optical Character Recognition Reader (OCR)—The ability of a scanner with the proper software to capture, recognize and translate printed alphanumeric characters into machine readable text. Most OCRs work by using either Pattern Matching or Feature Extraction. With pattern matching, the software is given a "template" of possible characters. When the scanner sees a letter, it compares it to its library of pattern templates. If there is enough of a match, it safely assumes it has "recognized" the letter and sends the ASCII equivalent of the letter to the output file. Feature extraction is more sophisticated. Its "library" consists of groups of information regarding a character's features; i.e. the letter "A" has two diagonal lines; the lines intersect at the top; it has a horizontal line that crosses from one of the lines to the other, etc. As the OCR scans, it compares features of the character to its feature library. Feature extraction is used to recognize handwriting in certain constrained cases. All OCR software further supports its "guesses" by knowing a little something about the language. A digit "1" is not likely to fall in between a group of letters; the letter "h" frequently follows the letter "t," etc.

Optical disc—A direct access storage device that is written and read by laser light. Certain optical discs are considered Write Once Read Many (WORM), because data is permanently engraved in the disc's surface either by gouging pits (ablation); or by causing the non-image area to bubble, reflecting light away from the reading head. Erasable optical drives use technologies such as the magneto-optic technique, which electrically alters the bias of grains of material after they have been heated by a laser. Compact discs (CDs) and laser (or video) discs are optical discs. Their storage capacities are far greater than magnetic media and are likely to replace magnetic hard disks and tape in the near future.

Parallel processing—The simultaneous execution of two or more process operations in a single computer system.

Pixel—An acronym for "Picture Element". Also called a Pel. When an image is defined by many tiny dots, those dots are pixels. On the printed page, each pixel is

one dot. On color monitors, though, a pixel can be made up of several dots, with the color of the pixel depending on which dots are illuminated, and how brightly.

Port—The channel in a computer used for input and output to a peripheral device.

Process execution—The duration in time when manual process and workflow process execution takes place in support of a process.

Query—To ask or inquire about something within a database.

Queue—A stream of tasks waiting in line to be executed.

Queue Time—the amount of time in which a case is waiting to be serviced, starting from the point that the task processing is started.

RAID—Redundant array of independent or inexpensive disks. A storage device that uses several optical discs working in tandem to increase bandwidth output and to provide redundant backup.

Random Access Memory (RAM)—The primary memory in a computer. Memory that can be overwritten with new information. The "random access" part of its name comes from the fact that all information in RAM can be located, no matter where it is, in an equal amount of time. This means that access to and from RAM memory is extraordinarily fast. By contrast, other storage media, like magnetic tape, requires searching for the information, and therefore takes longer.

Raster—Description of a rectangular or square array formed by a number of horizontal lines comprising a number of picture elements. The number of scan lines establishes the vertical dimension of the array and the number of picture elements forms vertical rows which establish the horizontal dimension of the array

Read cache—The cache is used to accelerate read operations by retaining data which has been previously read, written, or erased, based on prediction that it will be reread.

Read Only Memory (ROM)—Data stored in a medium that allows it to be accessed but not erased or altered.

Record—In a database, a record is a group of related data items treated as one unit of information, for example, policyholder's name, address, social security number, etc. Each item in the record is a field.

Reduced Instruction Set Computing (RISC)—A computer system with a special microprocessor that processes fewer instructions, and thereby is much faster. A RISC system depends on software to perform many of the functions that would normally be done by microprocessors. RISC workstations are used in calculation-intensive operations such as those performed by computer-aided design (CAD) and computer-aided manufacture (CAM) engineers.

Remote Procedure Call (RPC)—A mechanism through which applications can invoke procedures and object methods remotely across a network. Using RPC, an application on one machine can call a routine or invoke a method belonging to an application running on another machine.

Resolution—(1). Measure of output capability, usually expressed in dots per inch (dpi). (2). Measure of halftone quality, usually expressed in lines per inch (lpi). The higher the resolution, the greater amount of detail may be shown. If a resolution is agreed upon as a standard, it is called a graphics standard.

Retrieval key—A word, number or phrase associated with a document to aid in its retrieval from storage. Sometimes called descriptors. There are often many retrieval keys used together to fully locate a document; together they are called an index.

Rewritable optical—Optical media from which data can be erased and new data added. Magneto-optical and phase change are the two main types of rewritable optical discs.

Rewritable optical disk—Optical disk on which data is recorded. The data in specified areas an subsequently be deleted and other data can be recorded.

Rule—A definition criteria that the system will evaluate to automatically determine an action or route to be taken by a case at a particular point in a workflow process.

Scan—To convert human-readable images into bit-mapped or ASCII machine-readable code.

Server—A computer which is dedicated to one task. A database or directory server would be responsible for responding to a user's search request, returning the list of stored documents that meets with the parameters of the request.

SSA (Serial Storage Architecture)—A high speed serial interface designed and marketed by IBM.

Storage capacity—Amount of data that can be contained in an information holding device or main memory, generally expressed in terms of bytes, characters or words.

Storage media—The physical device itself, onto which data is recorded. Mag tape, optical discs, floppy disks are all storage media.

Systems Network Architecture (SNA)—IBM's very successful means of networking remotely located computers. It is a tree-structured architecture, with a mainframe host computer acting as the network control center. Unlike the telephone network, which establish a physical path for each conversation, SNA establishes a logical path between network nodes, and it routes each message with addressing information contained in the protocol.

Tagged Image File Format (TIFF)—A bit map file format for describing and storing color and gray scale images.

Transmission Control Protocol/Internet Program (TCP/IP)—A set of protocols developed by the Department of Defense to link dissimilar computers across networks.

UNIX—A general-purpose, multi-user, multitasking operating system invented by AT&T. UNIX is powerful and complex, and needs a computer with a large amount of RAM memory to support its power. UNIX allows a computer to handle multiple users and multiple programs simultaneously. And it works on many different computers, which means you can often take applications software and move it, with little changing, to a bigger, different computer, or to a smaller, different computer. This process of moving programs to other computers is known as "porting."

Variable length record—A file in a database containing records not of uniform length and in which the distinctions between fields are made with commas, tabs or spaces (called "delimited.") Records become uniform in length either because they are uniform to start with or they are "padded" with special characters.

Vector—Images defined by sets of straight lines, defined by the locations of the end points. At larger magnifications, curves may appear jagged. This condition is called aliasing.

Visual Basic Extensions (VBXs)—add on programs (written in C or C++) to the Microsoft's Visual Basic development environment that perform specific functions, such as putting a menu on a screen, or deskewing images). VBXs can be combined to build customized document imaging application modules.

Warm and hot spares—Drives that are electronically connected and powered on (hot spare) or powered-off (warm spare). When a drive fails, the controller automatically uses the hot or warm spare.

Windows—A Microsoft operating system that features multiple screens and a graphical user interface (GUI).

Workflow—A program that queues, tracks and otherwise manages documents, work items, and collections of documents and work items as they progress from entry into the system, through the various individuals or departments in the organization until a business process is completed.

Workflow application—A software program(s) that will either completely or partially support the processing of work items in order to accomplish the objective of a workflow process activity instance or instances.

Workstation—A single-user microcomputer or terminal

Write Once Read Many (WORM)—Optical storage device on which data is permanently recorded. Data can be erased, but not altered, and no additional data can be added.

NOTES

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"The significant problems we face cannot be solved by the same level of thinking that created them."

Albert Einstein

Domino.Doc

The power of people working together

Domino.Doc from Lotus is an out-of-the-box document management application that leverages the power of the Lotus Domino Server. It also provides a framework for collaborating on the creation of content. Domino.Doc makes it easy to set up collaborative yet controlled file cabinets that internal and external users can access from Web browsers or Notes clients.

ImagePlus

Information without limits

ImagePlus, IBM's line of production image software enables organizations replace paper-based information with electronic images. ImagePlus products allow images, and other electronic documents, to be captured, indexed, stored, and moved through a workflow.

OnDemand

Information online, on demand, on budget

OnDemand is the IBM line of Electronic Archive Solutions for computer output. Large volumes of documents are automatically indexed and stored. The documents retrieved for view, print, or fax look exactly the same as originally delivered to your customer including fonts, logos, and graphics.

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Workflow extended across and beyond the enterprise

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RHEINNER GUIDE

This Technology Guide is one of a series of guides, written by The Rheinner Group and published by ATG, designed to put complex document management, imaging, and workflow concepts into practical and understandable terms. Each guide provides objective, non-biased information to assist in the internal education, evaluation and decision making process. This Technology Guide, as well as the other Document Management, Imaging, and Workflow Technology Guides in the series, are available on ATG's Web Site.

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