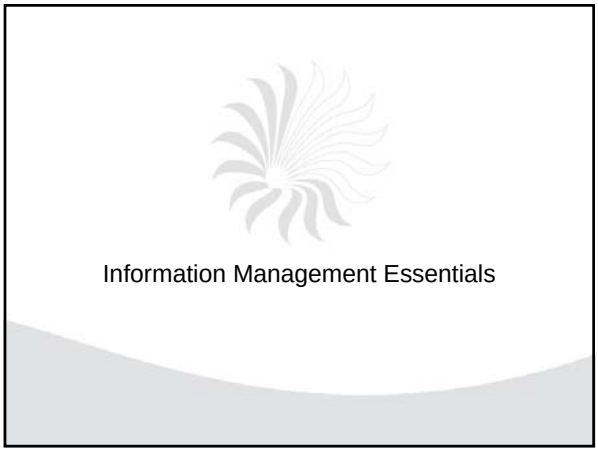

HB MEDIA GROUP


Information Management Essentials


Objectives
Information Management basics (inventory, analysis, taxonomy, retention, business process management, technology implementation and business resumption)
Terminology related to information management
How proper information management programs and systems can provide security and accountability.

Food for Thought

"An immense and ever-increasing wealth of information is scattered about the world today--- information that would probably suffice to solve all the mighty difficulties of our age---but it is dispersed and unorganized. We need a sort of mental clearinghouse for the mind: a depot where information … [is] received, sorted, summarized, digested, clarified and compared."

--H.G. Wells, 1940

What is Information Management

- Information Management is the strategic planning, budget, control and tactical implementation of the creation, use, distribution, protection, preservation, retention and disposition of an organization's information, regardless of format or medium; information can be data, content, documents, records and/or digital assets (images, video, etc.).

Benefits of Information Management

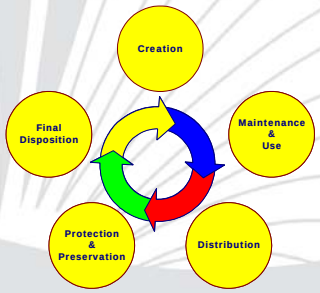
- Reduce operating costs
- Increase office/server/computer space
- Enhance decision-making
- Ensure the right information is delivered in a timely manner
- Audit and compliance
- Legally protect the organization, its employees and customers
- Properly integrate technologies

Why Do We Need Information Management?

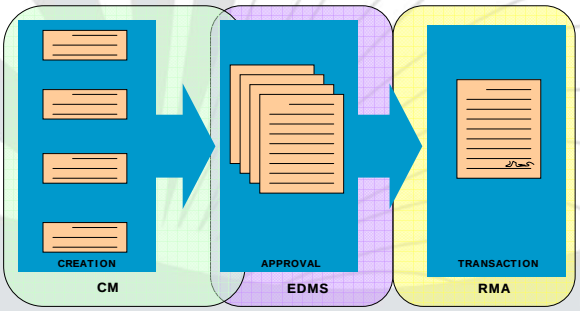
- 1MB = 5 lbs. of paper
- 1GB = 5000 lbs. of paper
- 5000 lbs. X 100 workers = 250 TONS of paper!

Information Management Lexicon

Information Life Cycle



Information Management Concepts



Inventory

- **15%** of all organizational revenue is spent on the creation, management and distribution of information
- **60%** of people's time is spent working with records
- **75%** of records are STILL in paper form
- The average worker spends **65%** of time looking for information
  - Delphi Group, 1999

Inventory Components

- What information the organization creates?
- Who creates it?
- Format and medium in which it is created
- Where it is physically located?
- Where it is distributed?
- Who works on it (collaboration)?
- How it flows through the organization (business process management)
- How long the workgroup and company need it (retention)?
- How vital it is to the continuation of the organization (business resumption)?
- How it is located (architecture)?

Inventorying Electronic Information

- Identify Electronic Systems and Electronic Tools
- Identify how they are maintained (hardware type, software type and version, stored on LANs, mainframes, stand-alones, centralized or decentralized storage)

Inventorying Electronic Information

- Is information key-entered or downloaded?
- Who manages the systems?
- Who uses the systems?
- What is the estimated growth of the information?
- Can the information be altered?

Inventorying Electronic Information

- What are the users needs for the information?
- How far do they need to go back?
- Can information generated from a system be regenerated with full integrity?
- What are the backup procedures?
- Is there documentation for the system?

Inventory Methods

- Web forms
- Personal Interviews
- PC/Hard copy forms

Analysis

- Find repetition
- Find collaboration points
- Map information types (data, content, documents, records)
- Identify vital information
- Identify confidential information

Architecture (Taxonomy)

- Organization Chart for your information
- Ear-mark confidential and vital information
- Dublin Core Metadata Initiative® (www.dublincore.org)

Retention

- Record Series Identification
- Legal, Fiscal, Administrative, Archival Values
- Federal Law (CFR, Sarbanes-Oxley, HIPAA)
- State and Local Law
- Corporate Legal Counsel Approval

Retention Schedule Components

- Listing of each record series
- How long to keep in offices (active)
- How long to keep in low cost storage (inactive)
- Disposition rules (NOT synonymous with destruction)

Retention Schedule Benefits

- Organizational guide for managing information workflow
- Reduces filing equipment purchases (paper and electronic)
- Ensures accurate information delivery
- Shows consistency during litigation

Business Process Management

- Study existing processes
- Improve process (reduce bottlenecks)
- Technology solution

Technology Implementation

- Processes define technology; Technology should not define processes
- ROI analysis
- Must work within corporate IT framework
- Budget 75% of software cost for installation and customization
- Staff to maintain and troubleshoot software
- Annual maintenance costs

Business Resumption

- Insurance policy; no ROI
- Processes for recovery of all vital information, regardless of format or medium
- Off-site storage vendors
- Hot/Cold sites

Choose the appropriate tool

- Electronic Document Management System (EDMS)
- Records Management Application (RMA)
- Web Content Management Application (WCM)
- Enterprise Portal

Tool Components

- Assigning Properties (Indexing with Metadata)
- Check-in, Check-out
- Versioning
- User and Group Security
- Audit
- Retention Assignment
- Batch Disposition

Implement Processes

- Litigation/Discovery
- Use of Electronic Communication Systems
- Information Audits/QA
- Privacy
- Ownership of Company Information

Hire an Information Management Professional

- Manages all types of information, physical *and* virtual
- Facilitator and architect
- Provides value from information
- Has strong knowledge and experience with EDMS, content management, records management, digital asset management
- Captures and translates context of the information
- Information integrator
- Proactive
- Strategic

Critical Success Factors

Management Achieve executive support and identify champions to obtain funding	**Culture** Develop organization structure, culture, business processes and environment conducive to information/knowledge development and sharing
Technology Add value and achieve measurable improvements with a scalable system	**Strategic Initiatives** Select initiatives aligned with organization's mission and goals

Source: "Applying the Four Pillars of Knowledge Management." KMWorld January 2002.

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Professional Resources

- ARMA International
  - http://www.arma.org
  - Anita Willis, 888-299-4319
- DoD 5105.2-STD RMA Standard
  - http://jitc.fhu.disa.mil/recmgt/
- Records and Information Management Resource List
  - http://infomgmt.homestead.com
- Bartleby Online Educational Reference
  - http://www.bartleby.com

Records and Information

Management Lexicon

(courtesy Lower Colorado River Authority)

Accession is the transfer of records from a department to the Records Center or to Corporate Archives for storage and retrieval.

An **active record** is one that is required for current use. Generally, records that are accessed more than once per month are active records.

Appraisal is the process of determining the value and disposition of records and designating them either temporary or permanent. The evaluation of a document's value for retention or archival purposes is based upon its current or predicted future uses for administrative, legal, fiscal, research, or historical purposes.

Archives are records that are preserved because of their continuing historical or research value.

A **back-up system** is a standardized method for creating and maintaining copies of information stored electronically. A back-up system includes the operator, procedures, and equipment for creating and maintaining copies. Back-up systems are part of business continuity planning for disaster recovery, not part of records retention programs.

Classification is the process of putting like documents and information together for filing purposes. A records classification is a group of records related by common characteristics.

COLD is an acronym for Computer Output to Laser Disk, the process of transferring computer output to an optical disk.

Color coding is a filing system in which color is used to represent a number, word, or letter.

COM is an acronym for Computer Output Microfilm, the process that converts and records data from a computer onto microfilm in human-readable format.

A **convenience copy** is a duplicate version of a record kept for reference use only. The copy is a non-record regardless of media or location. When an electronic document is printed on paper or COM (Computer Output Microfilm), the electronic copy of the document is considered a convenience copy.

A **cubic foot** is the basic volume measurement of paper records. It measures a space one foot high by one foot wide by one foot long. The standard records storage box is one cubic foot.

The **Department of Record** is responsible for specific official records during their active life span, including file maintenance and disposition.

A **disaster** is a sudden, unplanned, calamitous event that causes a disruption in normal business operations. Examples are fire, flood, tornado, hard disk failure, and misfiled "lost" files.

A **Disaster Plan or Disaster Recovery Plan** is a records management tool that is used as a guideline to manage activities needed to recover vital records so that business functions can return to a pre-disaster condition.

Disaster Preparedness is a records management tool that includes a set of policies and procedures to ensure the protection of all vital records in the case of a disaster.

Disposition is the last step in the life cycle of a record. Disposition means the record's physical destruction or its transfer to Archives for permanent preservation.

Document recorded information regardless of physical form or characteristics. A document may meet the definition of a record, or it may not and therefore be a non-record.

An **electronic information system** is a software package on a computer platform and is a non-record. Examples are Access, Excel, Word, PeopleSoft, Maximo, and Windows.

An **electronic record** is a record stored in a form that only a computer can process, including magnetic and optical media. Electronic records are the same as non-electronic records for retention and other records management purposes. Electronic records can be either official records or convenience copies (non-records). Examples of electronic records are word processing documents, electronic spreadsheets, and individual rows of related data in electronic databases.

A **file** is a group of related documents. In paper-based records systems, file often refers to one or more documents in a single file folder. Files generally refers to a collection of records or file folders that have been arranged to facilitate their retrieval and use. In electronic records systems, file refers to a collection of data resident on some type of electronic storage device.

File integrity refers to the accuracy and completeness of a group of records.

Historical or archival value is the value that records possess for documenting the history of an organization. Records with historical value are worthy of permanent preservation as archival materials.

A **hold order** halts the records destruction process. Reasons for hold orders are pending litigation or discovery, open records requests, and pending audits.

Inactive Records are records that are not needed for current use, but must be kept for their retention periods. They have reference rates of less than once per month.

In manual filing, **indexing** refers to determining the name or number under which a document is to be filed. In electronic filing, it refers to identifying the keyword under which a document may be retrieved.

The **life cycle** of a record is its passage through four stages: creation or receipt, active use and distribution, inactive storage, and disposition.

Micrographics is a photographic process for creating miniaturized images of records on film for space saving and durability. The process includes the creation, quality control, storage, and use of various microforms, such as aperture cards, roll film, and microfiche.

A **non-record** is a document that is (a) not created or received in the course of business; (b) not considered to contain information of value, such as blank forms or duplicate copies of publications; (c) a convenience copy, or (d) any item that is not a record (awards, plaques, old equipment, etc.). Non-records do not appear in the Retention Schedule. However, non-records may be subject to retrieval and release pursuant to litigation or requests if the entity has possession of such records.

An **official record** (often called simply a **record**) is any document, paper, letter, book, map, photograph, sound or video recording, microfilm, magnetic tape, electronic medium, or other information recording medium, regardless of physical form or characteristic and regardless of whether public access to it is open or restricted under the laws of the state, created or received by the entity or any of its officers or employees pursuant to law, including an ordinance, or in the transaction of public business.

Purging is an action taken to remove records from their current file position in order to eliminate outdated, superseded, or duplicate material. Examples are to purge active records for transfer to inactive storage and to purge records whose retention period has expired.

A **record series** is an organized collection of documents, files, or records on the same topic or of the same type that are generally filed and used together. A record series may include just one record or many individual records. Examples are contracts, payroll checks, and "as built" engineering drawings.

Record-keeping system is an organized and inventoried repository for records. For paper records it may be a departmental file room or an individual's work files. For electronic records, it is a document management software application allowing access and version control, indexing, and profiling to allow for easy retrieval and purging.

Records Coordinator is a designated individual in each department or area who works with the Records and Information Management Services department as needed to assist in implementing and coordinating records management.

Records destruction is the deletion of records from an organization’s files. Under state law, the process can be done in any manner, including burning, shredding, pulping, burial in a landfill, or sale or donation for recycling.

A **records management program** is a planned, coordinated set of policies, procedures, and activities to manage information. A records management program encompasses the creation, maintenance, use, and disposition of records, regardless of media.

The **Records Retention Schedule** lists the types of records maintained by an organization and specifies the periods of time after which their disposition is authorized. The schedule also identifies archival records and mandates their permanent retention.

The **retention period** is the length of time that must pass before a record is eligible for disposition. The length of time is based on the value of the information for business purposes, fiscal and legal requirements. Retention periods begin in the fiscal year of creation or receipt and end upon the occurrence of a specified event.

Risk is the probability that a threat will become a reality and cause a loss.

Threat is any event that can cause loss, damage, or destruction of vital records.

An **unauthorized record** is a record or convenience copy that has been kept past the retention period of its record series. The only valid reasons for maintaining records after their retention periods are for pending requests under the Texas Open Records Act or for pending litigation.

Uniform Filing Structure (UFS) or Taxonomy is a method of classifying related records in functional categories.

Vital records are records that are necessary for the resumption of business after a disaster or for continuation of operation in an emergency or disaster.

"RESOURCES FOR RESEARCHING A RECORDS RETENTION PROGRAM"

Compiled by Angie Fares, MBA, RHIA from various sources;

Note: Many of these resources can be purchased from the ARMA Book Store at (www.arma.org):

Buried Alive. Commonwealth Films. Video blockbuster that raises awareness for strong records management and retention procedures. Dramatic presentation on how documents should be systematically retained or destroyed without risking destruction of vital information or evidence. Promotes be better understanding of records and information management practices. Can also be rented instead of purchased. ARMA International, 4200 Somerset Drive, Suite 215, Prairie Village, KS 66208. Telephone: (913)341-3808.

Code of Federal Regulations. Office of the Federal Register, National Archives and Records Administration, Superintendent of Documents, U.S. Printing Office, Washington, DC 20402.

Darwin. BrainCore. A web-enable record retention software product with federal and state record retention guidelines available from the Internet for a monthly subscription fee. Website: www.braincore.com or contact Jim Romer at 3003 LBJ Freeway, Suite 122E, Dallas TX 75234 or (972)247-8779.

Designing an Effective Records Retention Compliance Program. Dietel, J. Edwin, J.D., ARMA International, 4200 Somerset Drive, Suite 215, Prairie Village, KS 66208. Telephone: (913)341-3808 (Clark Boardman Callaghan). This book is Volume III of a 10-volume Corporate Compliance Series and is updated with replacement pages annually. There is not charge for updates within three months of purchase.

Developing and Operating a Records Retention Program – A Guideline. ARMA International, 4200 Somerset Drive, Suite 215, Prairie Village, KS 66208. Telephone: (913)341-3808. ISBN 0-933887-18-3.

Electronic Evidence: Strategies for Managing Records in Contemporary Organizations. Bearman, David. Archives and Museum Informatics. ISBN: 1-885626-08-8.

Electronic Records Retention: An Introduction. Stephens, David O. CRM, CMC, Wallace, Roderick C., CRM. ARMA International, 4200 Somerset Drive, Suite 215, Prairie Village, KS 66208. Telephone: (913)341-3808. ISBN 0-933887-69-8.

Essential Elements of Local Government Records Management Legislation. U.S. Legislative and Regulatory Affairs Subcommittee. ISBN: 0-933887-49-3.

File Law National. Carswell Thomson Professional Publishing. This CD-ROM contains Canadian statutory and regulatory provisions that affect record retention requirements. File Law Regional is available for specific Canadian states. ARMA International, 4200 Somerset Drive, Suite 215, Prairie Village, KS 66208. Telephone: (913)341-3808 (Carswell Thomson Professional Publishing).

Financial Institutions Record Retention Manual (Second Edition), Morrissette, Nan Heldenbrand, Financial Managers Society, 8 South Michigan Avenue, Chicago, IL 60603-3307. Telephone: (312)578-1300.

Finding the Law: A Workbook on Legal Research for Laypersons. Superintendent of Documents, U.S. Printing Office, Washington, DC 20402. Telephone: (202)783-3238. S/N 024-011-00148-4. 1982.

Guide to Records Retention. Hancock, W.A., Editor, Business Law Inc., 8228 Mayfield Road, Chesterland, OH 44026. Telephone: (216)729-7996.

Guide to Records Retention Requirements in the Code of Federal Regulations. Office of the Federal Register, National Archives and Records Administration, Superintendent of Documents, U.S. Printing Office, Washington, DC 20402. Telephone: (202)783-3238.

Information and Image Management. Ricks, Betty R., Swafford, Ann J., Gow, Kay F. ARMA International, 4200 Somerset Drive, Suite 215, Prairie Village, KS 66208. Telephone: (913)341-3808. ISBN 0-538-70068-8 (Southwestern Publishing).

Information and Records Management. Robek, Mary F., CRM, Brown, Gerald F., CRM, Stephens, David O., CRM, CMC. ARMA International, 4200 Somerset Drive, Suite 215, Prairie Village, KS 66208. Telephone: (913)341-3808. ISBN 0-02-801793-5 (Glencoe).

Law of Electronic Commerce: EDI, E-Mail, and Internet: Technology, Proof and Liability, 3rd Edition. Wright, Benjamin, JD and Winn, Jane K. Aspen Law & Business Publishers. ISBN: 1-56706-940-1.

Law, Records and Information Management: The Court Cases. Skupsky, Donald, JD, CRM, Montana, John C., JD, Information Requirements Clearinghouse, 5600 Quebec Street, Suite 250-C, Englewood, CO 80111. Telephone: (303)721-7500. ISBN 0-0929316-32-0.

Legal Requirements for Business Records; Guide to Records Retention and Recordkeeping Requirements. Skupsky, Donald S. JD, CRM, Information Requirements Clearinghouse, 5600 Quebec Street, Suite 250-C, Englewood, CO 80111. Telephone: (303)721-7500.

Legal Requirements for Information Technology Systems. Skupsky, Donald, JD, CRM, Information Requirements Clearinghouse, 5600 Quebec Street, Suite 250-C, Englewood, CO 80111. Telephone: (303)721-7500. ISBN 0-0929316-04-5.

Legal Research. Barber, Steve, McCormick, Mark A., ARMA International, 4200 Somerset Drive, Suite 215, Prairie Village, KS 66208. Telephone: (913)341-3808. ISBN 0-8273-7474-7.

Legality of Microfilm. Williams, Robert F. Cohasset Associates. ARMA International, 4200 Somerset Drive, Suite 215, Prairie Village, KS 66208. Telephone: (913)341-3808.

Legality of Optical Storage. Williams, Robert. F. Cohasset Associates. ARMA International, 4200 Somerset Drive, Suite 215, Prairie Village, KS 66208. Telephone: (913)341-3808.

Performance Guideline for Admissibility of Records Produced by Information Technology Systems: Parts I – IV. Association for Information and Image Management. ANSI/AIIM. ISBN: 0-89258-289-8. ARMA International, 4200 Somerset Drive, Suite 215, Prairie Village, KS 66208. Telephone: (913)341-3808.

Recordkeeping Requirements. Skupsky, Donald S. JC, CRM, Information Requirements Clearinghouse, 5600 Quebec Street, Suite 250-C, Englewood, CO 80111. Telephone: (303)721-7500. ISBN 0-929316-03-7.

Records Retention: Law and Practice: Federal. Anson-Cartwright, Robert F., C.A., C.B.V., Hollingshead, Robert, C.A., Kennish, Timothy, LL.B.bert. ARMA International, 4200 Somerset Drive, Suite 215, Prairie Village, KS 66208. Telephone: (913)341-3808 (Carswell Thomson Professional Publishing).

Records Retention: Statues and Regulations. ARMA International, 4200 Somerset Drive, Suite 215, Prairie Village, KS 66208. Telephone: (913)341-3808 (Tab, Datafile, Carswell Thomson Professional Publishing).

Records Retention Procedures. Skupsky, Donald S. JC, CRM, Information Requirements Clearinghouse, 5600 Quebec Street, Suite 250-C, Englewood, CO 80111. Telephone: (303)721-7500. ISBN 0-020316-03-7.

Records Retention Resource Guidelines for U.S. Based Gas Utilities. ARMA International, Utilities Industry Specific Group, 4200 Somerset Drive, Suite 215, Prairie Village, KS 66208. Telephone: (913)341-3808. ISBN 0-933887-66-3.

Records Retention Resource Guidelines for U.S. Based Electric Utilities. ARMA International, Utilities Industry Specific Group, 4200 Somerset Drive, Suite 215, Prairie Village, KS 66208. Telephone: (913)341-3808. ISBN 0-933887-52-3.

Report on Issues Surrounding Retention of Client Files in Law Firms. Andrews, Helen, Holloway, Phillip L., Ledwith, Clare M., Mutchler, K. Anne, Shea, Roseanne M., Zimmerman, Gloria. ARMA International, 4200 Somerset Drive, Suite 215, Prairie Village, KS 66208. Telephone: (913)341-3808. ISBN 0-933887-46-9.

Retention 5.0. Zasio Enterprises Inc., 12426 West Explorer Drive, Suite 250, Boise, ID 83713. Telephone: (208)375-8000. This is a 32-bit Windows application and requires Windows NT or Windows 95. This software also requires a Structured Query Language (SQL) database (e.g., Oracle, Sybase, Interbase, Microsoft SQL Server) to run.

Retention Manager. Skupsky, Donald S., JD, CRM, Information Requirements Clearinghouse, 5600 Quebec Street, Suite 250-C, Englewood, CO 80111. Telephone: (303)721-7500. Requires a 486 PC-compatible computer, Windows 3.1, 95 or NT, 16 MB RAM, 150 MB disk storage, VGA monitor, CD-ROM drive.

Retention Manager. Information Requirements Clearinghouse. This is a full-featured software and data program to facilitate legal research and development of records retention schedules. The software implements the “Skupsky Retention Methodology” and the purchase price includes subscription service, technical support, quarter updates and software upgrades. ARMA International, 4200 Somerset Drive, Suite 215, Prairie Village, KS 66208. Telephone: (913)341-3808 (Carswell Thomson Professional Publishing).

Vital Records – A Guideline (Second Edition). ARMA International Standards Committee: Vital Records Task Force, 4200 Somerset Drive, Suite 215, Prairie Village, KS 66208. Telephone: (913)341-3808. ISBN 0-933887-14-0.

Web Technology Lexicon

Protocols

HTTP: Hypertext Transfer Protocol. An application-level protocol with the lightness and speed necessary for distributed, collaborative, hypermedia information systems. It is a generic, stateless, object-oriented protocol which can be used for many tasks, such as name servers and distributed object management systems, through extension of its request methods (commands). A feature of HTTP is the typing and negotiation of data representation, allowing systems to be built independently of the data being transferred.

FTP: File Transfer Protocol. A way to exchange files with other sites on the Internet.

TCP/IP: TCP/IP (The **Transmission Control Protocol/Internet Protocol**) is the protocol suite that drives the Internet. Specifically, TCP/IP handles network communications between network nodes (computers, or nodes, connected to the net). The suite is actually composed of several protocols including IP which handles the movement of data between host computers, TCP which manages the movement of data between applications, UDP which also manages the movement of data between applications but is less complex and reliable than TCP, and ICMP which transmits error messages and network traffic statistics.

TELNET: Telnet provides a way to "log in" to a remote computer; your keyboard and monitor act as if attached to the remote computer. You can use the same services as a local user. You can run programs on a computer on the other side of the world, just as if you were sitting in front of it. The remote computer is frequently called a host computer.

MIME: Multipurpose Internet Mail Extension. A description of the contents of a file or attachment, now called Media Type.

SMTP: SMTP (**Simple Mail Transfer Protocol**) is a TCP/IP protocol used in sending and receiving e-mail. However, since it's limited in its ability to queue messages at the receiving end, it's usually used with one of two other protocols, POP3 or Internet Message Access Protocol, that let the user save messages in a server mailbox and download them periodically from the server. In other words, users typically use a program that uses SMTP for sending e-mail and either POP3 or IMAP for receiving messages that have been received for them at their local server. Most mail programs such as Eudora let you specify both an SMTP server and a POP server. On UNIX-based systems, sendmail is the most widely-used SMTP server for e-mail. A

commercial package, Sendmail, includes a POP3 server and also comes in a version for Windows NT. (Courtesy Whatis.com)

POP3: POP3 (**Post Office Protocol 3**) is the most recent version of a standard protocol for receiving e-mail. POP3 is a client/server protocol in which e-mail is received and held for you by your Internet server. Periodically, you (or your client e-mail receiver) check your mail-box on the server and download any mail. POP3 is built into the Netmanage suite of Internet products and one of the most popular e-mail products, Eudora. It's also built into the Netscape and Microsoft Internet Explorer browsers. (Courtesy Whatis.com)

Development

ASP: Microsoft's Active Server Pages (ASP) technology provides a framework for building dynamic HTML pages which enable Internet and Intranet applications to be interactive.

DHTML: "Dynamic HTML" is typically used to describe the combination of HTML, style sheets and scripts that allows documents to be animated. Dynamic HTML allows a web page to change after it's loaded into the browser --there doesn't have to be any communication with the web server for an update. You can think of it as 'animated' HTML. For example, a piece of text can change from one size or color to another, or a graphic can move from one location to another, in response to some kind of user action, such as clicking a button.

HTML: is the *lingua franca* for publishing hypertext on the World Wide Web. It is a non-proprietary format, based upon SGML, for describing the structure of hypermedia documents - plain text (ASCII) files with embedded codes for logical markup, using tags like <A> and </A> to structure text into tables, hypertext links interactive forms, headings, paragraphs, lists, and more. It can be created and processed in a wide range of tools from simple plain text editors to sophisticated WYSIWYG (What You See Is What You Get) authoring tools.

FLASH: Flash is a web animation tool from Macromedia®. This tool is quickly becoming an animation standard due to its ability to launch high-quality animation very quickly using streaming. Flash requires a browser plug-in, but this plug-in is standard on 4.0 or higher Internet Explorer and Netscape Navigator.

VRML: VRML is an acronym for "**Virtual Reality Modeling Language**". It is the International Standard (ISO/IEC 14772) file format for describing interactive 3D multimedia on the Internet. Virtual Reality Modeling Language (VRML) is a standard language for the animation and 3D modeling of geometric shapes. It allows for 3D scenes to be viewed and manipulated over the Internet in an interactive environment. Using a special *VRML browser*, the user can connect to an online VRML site, choose a 3D environment to explore and move around the '3D world'. It is possible to zoom in and out, move around and interact with the virtual environment.

XML: Extensible Markup Language (XML) is a human-readable, machine-understandable, general syntax for describing hierarchical data, applicable to a wide range of applications (databases, e-commerce, Java, web development, searching,

etc.). Custom tags enable the definition, transmission, validation, and interpretation of data between applications and between organizations.

CSS: Cascading Style Sheets, developed by Microsoft, allow you to control the rendering, e.g. fonts, colors, leading, margins, typefaces, and other aspects of style, of a Web document without compromising its structure. CSS is a simple style sheet mechanism that allows authors and readers to attach style to HTML documents. It uses common desktop publishing terminology which should make it easy for professional as well as untrained designers to make use of its features. Visual design issues, such as page layout, can thus be addressed separately from the web page logical structure.

CGI: The **Common Gateway Interface**, or CGI, permits interactivity between a client and a host operating system through the World Wide Web via the Hyper Text Transfer Protocol (HTTP). It's a standard for external gateway programs to interface with information servers, such as HTTP or Web servers. A plain HTML document that the Web server delivers is static, which means it doesn't change. A CGI program, on the other hand, is executed in real-time, so that it can output dynamic information - perhaps a weather reading, or the latest results from a database query. CGI allows someone visiting your Web site to run a program on your machine that performs a specified task.

JAVA: A high-level programming language developed by Sun Microsystems. Java is an object-oriented language similar to C++, but simplified to eliminate language features that cause common programming errors. Java source code files (files with a .java extension) are compiled into a format called bytecode (files with a .class extension), which can then be executed by a Java interpreter. Compiled Java code can run on most computers because Java interpreters and runtime environments, known as Java Virtual Machines (VMs), exist for most operating systems, including UNIX, the Macintosh OS, and Windows. Bytecode can also be converted directly into machine language instructions by a just-in-time compiler (JIT). Java is a general purpose programming language with a number of features that make the language well suited for use on the World Wide Web. Small Java applications are called Java applets and can be downloaded from a Web server and run on your computer by a Java-compatible Web browser, such as Netscape Navigator or Microsoft Internet Explorer.

JAVASCRIPT: JavaScript is a compact, object-based scripting language for developing client and server Internet applications. JavaScript statements can be embedded directly in an HTML page. These statements can recognize and respond to user events such as mouse clicks, form input, and page navigation. For example, you can write a JavaScript function to verify that users enter valid information into a form. Without any network transmission, an HTML page with embedded JavaScript can interpret the entered text and alert the user with a message dialog if the input is invalid. Or you can use JavaScript to perform an action (such as play an audio file, execute an applet, or communicate with a plug-in) in response to the user opening or exiting a page. JavaScript is *a programmable API that allows cross-platform scripting of events, objects, and actions.* It allows the page designer to access events such as startups, exits, and users' mouse clicks. JavaScript extends the programmatic capabilities of Netscape Navigator (and to a slightly lesser extent, Microsoft's Internet Explorer) to a wide range of authors, and is easy enough for anyone who can compose HTML.

PERL: Perl, the premier language for developing CGI scripts, is an interpreted high-level programming language developed by Larry Wall. According to Larry, he included in Perl all the cool features found in other languages and left out those features that weren't so cool. Perl has become the premier scripting language of the Web, as most CGI programs are written in Perl. However, Perl is widely used as a rapid prototyping language and a "glue" language that makes it possible for different systems to work well together. Perl is popular with system administrators who use it for an infinite number of automation tasks. (Courtesy perl.net)

PHP: PHP (**Pre-Hypertext Processor**) is a server-side, cross-platform, HTML embedded scripting language. PHP is a tool that lets you create dynamic web pages. PHP-enabled web pages are treated just like regular HTML pages and you can create and edit them the same way you normally create regular HTML pages. The scripting is free and is available from http://www.php.net . (Courtesy php.net)

SSI: A **Server Side Include** is a command or directive placed in an HTML file through the use of a comment line. With a simple SSI command you can update an entire site design, dynamically add the current time and date or the date a file was last modified, execute shell and CGI scripts and more! ASP, PHP, and JSP all have SSI development code.

META: An HTML tag used in the Head area of a document to specify further information about the document, either for the local server, or for a remote browser. The META element is used within the Head element to embed document meta-information not defined by other HTML elements. Such information can be extracted by servers/clients for use in identifying, indexing, and cataloging specialized document meta-information. In addition, HTTP servers can read the contents of the document head to generate response headers corresponding to any elements defining a value for the attribute HTTP-EQUIV. This provides document authors with a mechanism for identifying information that should be included in the response headers of an HTTP request.

Graphics

RGB COLOR MODEL: The standard color model used on the Internet is *RGB*, which consists of a set of three values from 0 (zero) to 255 in decimal notation, or 0 - ff in hexadecimal (frequently mis-spelt as 'hex*i*decimal') notation. One of these values is for red, one is for green, and one is for blue - thus: **#RRGGBB,** where **RR, GG, BB** are the hexadecimal digits specifying the Red, Green, and Blue values of the color. The colors you create depend on the mixture of these three colors, which are indicated by their respective numerical values. Zero indicates the absence of a particular color; 255 indicates the strongest use of a color. For example,

- RED is: **255 0 0** in decimal, or **#ff0000** in hexadecimal.
- GREEN is: **0 255 0** in decimal, or **#00ff00** in hexadecimal.
- BLUE is: **0 0 255** in decimal, or **#0000ff** in hexadecimal.

CMYK COLOR MODEL: Cyan (blue), Magenta (red , Yellow and Black (K is used instead of B to avoid confusion with blue). This is the standard color model used for process color print media. There is a set of four values expressed as percents from 0 to 100. The lower the percentage, the lighter the color. Use this model when preparing an image to be printed using process colors. This format allows for color separation, a necessary step in print graphics. If a jpg or png file is saved using the CMYK model, they will not be able to see the image in their browser. They will see a solid black image. (courtesy CELM Corporation)

GIF: GIF is a proprietary specification of CompuServe Information Services. GIF was introduced by CompuServe, and stands for **Graphics Interchange Format**. It was intended to be a platform-independent format with which users could transfer files over modem lines at low speeds. Filenames typically end in .gif It's a compressed format with 1 to 256 colors (8-bit). Typically the compression is 3:1 to 5:1. There are two standards: 87a, 89a (transparency). It allows 1 bit transparency (a pixel is either transparent or opaque). It allows a palette of a maximum of 256 colors, so representation of 24 bit color images in GIF involves loss. GIF is best used for logos and solid color graphics.

IMAGEMAP: Images which have specified areas hyperlinked to some other page or service. An image with a number of different links associated with it. Clicks on different portions of the image go to different links. All browsers that can display images support server-side imagemaps; newer browsers also support client-side imagemaps, which resolve more quickly and can provide more feedback to the user.

JPEG: JPEG stands for **Joint Photographic Experts Group**. It's a lossy compressed format supporting 24-bit, over 16 million colors. Use it for full-color and grey scale naturalistic images; use JPEG when the image has at least 16 colors. JPEG is not good for small, detailed text or images with hard edges. The JPEG (Joint Photographic Experts Group) standard is excellent for most realistic images (photos for example, but not line drawings or logos). It uses a powerful, though nominally "lossy", compression method. JPEG is best suited for truecolor original images; avoid using it on images that have already been forced into a 256-color palette (logos and solid color graphics). Using JPEG for a photographic image for example can produce 10:1 savings compared to GIF, as well as permitting much better display quality on truecolor-capable displays. Netscape handles inline JPEG; some older browsers need to use an external JPEG viewer. For Mac, the extension for this file is .jpeg; for PC, it is .jpg

PNG: Portable Networks Graphic is a lossless, portable, well-compressed RGB file format that can include mask-channel information. PNG uses better image compression technology than GIF, allowing for smaller files that download more quickly. PNG allows for 1, 2, 4, 8, 16, 24 and 32 bit images, smashing the 8-bit barrier. PNG is being developed by the W3C, and will always be a free and open standard. PNG images allow for full alpha channel transparency, which makes moving images from one background to another easy. PNG can store gamma and chromaticity data for improved color matching on heterogeneous platforms. Users can see an image the way it was intended to be seen by selecting the gamma level intended for their monitor.

PDF: Adobe® **Portable Document Format** (PDF) is the open de facto standard for electronic document distribution worldwide. Adobe PDF is a universal file format that preserves all of the fonts, formatting, colors, and graphics of any source document, regardless of the application and platform used to create it. PDF files are compact and can be shared, viewed, navigated, and printed exactly as intended by anyone with a free Adobe Acrobat® Reader™. You can convert any document to Adobe PDF, even scanned paper, using Adobe Acrobat 4.0 software. (courtesy Adobe®)

Software

BROWSERS: Browsers help you view Web pages and navigate through the Web easily. The browser that triggered the WWW explosion was the Mosaic (X or Mac) public domain graphical user interface (GUI) from the National Center for Supercomputer Applications (NCSA). The most common browsers used today are Microsoft Internet Explorer and Netscape Navigator

SERVERS: A computer system built with additional processors and memory that allow multiple users to access information simulanteously. For the Internet, servers are specialized to balance the amount of traffic accessing sites. Below are the most common specialized servers:

> **Web Servers:** Web servers allow you to serve content over the Internet using the Hyper Text Markup Language (HTML). The Web server accepts requests from browsers like Netscape and Internet Explorer and then returns the appropriate HTML documents. A number of server-side technologies can be used to increase the power of the server beyond its ability to deliver standard HTML pages; these include CGI scripts, server-side includes, SSL security, and Active Server Pages (ASPs). ServerWatch keeps tabs on the top Web servers, check 'em out by click on the server of your choice at right.
>
> **FTP Servers:** FTP is a typical client and server arrangement. The FTP server does the heavy lifting of file security, file organization, and transfer control. The client, sometimes built into a browser and sometimes a specialized program, receives the files and places them onto the local hard disk. Clients range from invisible (typically in a browser), to command-line (the user types the commands), to elaborate GUI versions. FTP makes it possible move one or more files between computers with security and data integrity controls appropriate for the Internet.
>
> **Mail Servers:** This server handles all incoming and outgoing e-mails for an organization. When sending an e-mail over the Internet, it will travel through multiple mail servers before arriving at the recipients in-box. Mail servers are probably the most important server in today's business world.

News Servers: News servers function as a distribution and delivery source for the 20,000+ public news groups currently accessible over the USENET news network. USENET is the largest news and discussion group-based network on the Internet. The servers utilize the Network News Transport Protocol (NNTP) to interface with other USENET news servers and to distribute news to anyone using a standard NNTP newsreader (Agent or Outlook Express, for example). News servers also make it possible to serve your own news and discussion groups publicly over the Internet or privately over your own local network.

Telnet Servers: Telnet servers give users the ability to log on to a host computer and perform tasks as if they're actually working on the remote computer itself. Users can access the host through the telnet server from anywhere in the world using a telnet client.

Proxy Servers: Schematically, a proxy server sits between a client program (typically a Web browser) and some external server (typically another server on the Web). The proxy server can monitor and intercept any and all requests being sent to the external server or that comes in from the Internet connection. This positioning gives the proxy server three key capabilities: filtering requests, improving performance, and sharing connections. Filtering requests is the security function and the original reason for having a proxy server. Proxy servers can inspect all traffic (in and out) over an Internet connection and determine if there is anything that should be denied transmission, reception, or access. Since this filtering cuts both ways, a proxy server can be used to keep users out of particular Web sites (by monitoring for specific URLs) or restrict unauthorized access to the internal network by authenticating users.

Chat Servers: Communications servers allow you to serve information to a large number of users in an environment that is roughly similar to Internet newsgroups -- but one with real-time discussion capabilities. Potential applications include teleconferences, private meeting areas, help support forums, and employee recreational get-togethers.

Application Servers: Application servers, whatever their function, occupy a large chunk of computing territory between database servers and the end user. Most broadly, this "country" is called "middleware" and that tells you something about what application servers do. First and foremost, application servers connect database information (usually coming from a database server) and the end-user or client program (often running in a Web browser). There are many reasons for having an intermediate player in this connection -- among other things, a desire to decrease the size and complexity of client programs, the need to cache and control the data flow for better performance, and a requirement to provide security for both data and user traffic.

Database Servers: A form of application server, this server is the home for the database software. For performance purposes, a database is stored separately from the application it serves.

Audio/Video Servers: Audio and video servers deliver multimedia capabilities to Web sites by giving users the ability to listen to sound bytes and watch movie clips via Web browser plug-ins. While the use of traditional A/V formats like WAV and MIDI (sound) or MOV and AVI (video) on Web sites doesn't necessitate a specialized server, the recent emergence of streamed audio and video content has made the Audio/Video Server a necessity in many cases. The new streaming technology marks an important transition for A/V multimedia on the Web and will undoubtedly become one of the Web's most exciting technologies as it evolves.

SERVER PLATFORMS: Simply, a server platform is the server operating system. The platform will determine the performance of the application, web site, data query, etc. Some popular server platforms are UNIX, Linux, and Microsoft NT and Windows 2000.

EDITORS: An editor is a software application that allows a web developer to create web pages. Editors may be text-based or GUI. Although most high-end web developers still code in text-based editors, GUI editors have become more popular because they all fast, WYSIWYG development. Some popular editors are Allaire HomeSite and ColdFusion, Microsoft FrontPage and Visual InterDev, and Macromedia Dreamweaver and UltraDev.

PLUG-INS: Plug-ins are software programs that extend the capabilities of the browser you are using, giving you for example, the ability to do things like download and display or hear audio, video, animation, and special image viewing files. Some popular plug-ins are Adobe Acrobat Reader and Macromedia Shockwave.

OPEN SOURCE: The Open Source Business Model is a basic theory that when programmers on the Internet can read, redistribute, and modify the source for a piece of software**,** it evolves. People will improve it, adapt it, and fix bugs. Theoretically, this can happen at a much greater speed than the current slow pace of conventional software development. The open-source community believe that this rapid evolutionary process produces better software than the traditional closed model, in which only a very few programmers can see source and everybody else must blindly use an opaque block of bits.

Miscellaneous

BANDWIDTH: The amount of data transferred over a set amount of time through telecommunications lines. As it pertains to the Internet, the transfer of the data is measured in bytes with all of the bytes added together making up the bandwidth.

BYTES: binary term; A unit of storage that a computer treats as a single unit. 8 bits equal a byte, 1,024 bytes equal a kilobyte.

CACHING: A *Web cache* sits between Web servers (or *origin servers*) and a client or many clients, and watches requests for HTML pages, images and files (collectively known as *objects*) come by, saving a copy for itself. Then, if there is another request for the same object, it will use the copy that it has, instead of asking the origin server for it again. Types of caches include browser caches and proxy caches.

There are two main reasons that Web caches are used:

- To **reduce latency** - Because the request is satisfied from the cache (which is closer to the client) instead of the origin server, it takes less time for the client to get the object and display it. This makes Web sites seem more responsive.
- To **reduce traffic** - Because each object is only gotten from the server once, it reduces the amount of bandwidth used by a client. This saves money if the client is paying by traffic, and keeps their bandwidth requirements lower and more manageable.

COOKIES: A general mechanism which server side connections (such as CGI scripts) can use to both store and retrieve information on the client side of the connection. The addition of a simple, persistent, client-side state significantly extends the capabilities of Web-based client/server applications. Cookies are used by sites such as Amazon.com to allow personalization of the site and to track customer purchase preferences.

DOMAIN NAME: The name of an Internet site, for example arma.org. Generally, the ending of the domain name signifies the type of entity, i.e. .com is for commercial sites, .org is for non-profit organizations, .net is for Internet service providers and .gov is for U.S. Federal Government agencies. With the break-up of Internic and the allowance of new entities to create new domain registration services, new endings are being created. Some include .cc and .tv.

E-COMMERCE: Electronic Commerce is the buying and selling of goods and services or the transfer of money over the Internet or an Intranet. This can involve stores or banking activities. Standards have been established to make the process easier and more secure.

STREAMING: The simultaneous download and display of a video or audio file. As the browser downloads a segment of the file, it begins to play. As it is playing the first segment, the second segment is downloading. The process repeats itself until the entire file is downloaded and played.

URL: Uniform Resource Locator. A specification of the location of a link. It specifies the *protocol* (http:// for a web page,) *site name*, *path and file name* to the resource. Think of it as a networked extension of the standard filename concept: not only can you point to a file in a directory, but that file and that directory can exist on any machine on the network, can be served via any of several different methods, and might not even be something as simple as a file: URLs can also point to queries, documents stored deep within databases, the results of a finger or archie command, or whatever.

FIREWALL: A firewall is a set of related programs, located at a network gateway server, that protects the resources of a private network from users from other networks. (The term also implies the security policy that is used with the programs.) An enterprise with an intranet that allows its workers access to the wider Internet installs a firewall to prevent outsiders from accessing its own private data resources and for controlling what outside resources its own users have access to. (courtesy Whatis.com)

INTRANET: An intranet is a private network that is contained within an enterprise. It may consist of many interlinked local area networks and also use leased lines in the wide area network. Typically, an intranet includes connections through one or more gateway computers to the outside Internet. The main purpose of an intranet is to share company information and computing resources among employees. An intranet can also be used to facilitate working in groups and for teleconferences. (courtesy Whatis.com)

EXTRANET: An extranet is a private network that uses the Internet protocol and the public telecommunication system to securely share part of a business's information or operations with suppliers, vendors, partners, customers, or other businesses. An extranet can be viewed as part of a company's intranet that is extended to users outside the company. It has also been described as a "state of mind" in which the Internet is perceived as a way to do business with other companies as well as to sell products to customers. The same benefits that HTML, Hypertext Transfer Protocol (HTTP), Simple Mail Transfer Protocol (SMTP), and other Internet technologies have brought to the Internet and to corporate intranets now seem designed to accelerate business between businesses. (courtesy Whatis.com)

LEGACY SYSTEMS: Software critical to the operation of organizational processes and representing extensive development investment. The system, due to design, is resistant to change. These systems are usually ten to twenty-five years old, mainframe-based, contain vast amounts of data, are poorly structured, poorly understood due to personnel turnover, yet represent a substantial amount of corporate knowledge.

APPLICATION PROGRAM INTERFACE (API): a formalized set of software calls and routines that can be referenced by an application program in order to access supporting system or network services

***NOTE: A full lexicon for webmasters may be found at http://wdvl.internet.com/WebRef/Lexicon/ and http://www.whatis.com**