Internet Access and Information Dissemination: Selected Topics - 4
Draft... for review and comment only ... Draft
Office of Technology, State of Minnesota

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16.CATALOGING AND INDEXING

Description:
Materials available through the Internet need to be well organized, both for maintenance by agencies, and for retrieval by users. Content organization needs to be documented and managed through some method of cataloging and indexing. The process of searching and retrieving information could be overwhelming without the use of locator tools. Eventually, based on agency experience, user feedback, and sharing the expertise of those in related information management fields (i.e., library cataloging, archiving, and others), improvements can be made to the organization of information for electronic dissemination.

Like publications, agency on-line service may need to be cataloged by the Legislative Reference Library in the PALS system.

Recommendations:

1. Agencies should be aware of and follow state requirements for copying the Legislative Reference Library on documents as required by legislation.
2. Agencies should establish a cataloging and indexing system that can be implemented electronically (such as through electronic information "hyperlinks").

References:
Federal Government Information Locator Service Standards

17. CONVERSION TO INTERNET FORMATS

Description:
Documents and information must be in standard Internet formats before they can be published electronically. In most cases, existing documents can be converted for electronic publication, and may need to coexist with their non-Internet counterparts. Documents created only for electronic publication (such as home pages) may be created directly in the appropriate format.

Requirements:

1. Agencies that contract with outside vendors for the design and production of major reports and publications must also require versions in the standard Internet formats used by the agency.

Recommendations:

1. Conversion of documents into standard formats for the Internet (ASCII text, HTML, and others) should be built into a general publishing strategy.
2. The use of automated document conversion should be encouraged when possible (a number of software programs exist to assist with document conversion.). In some cases, documents may require specialized formatting thus need individual attention.
3. Version control and change management procedures should be established that keep track of multiple simultaneous versions of documents. Conversions to Internet formats may result in two or more versions of the same document that need to be managed.

INFORMATION DESIGN TOPICS:

18. INFORMATION DESIGN FOR INTERNET PUBLICATION

Description:
Scope: ***Information design*** includes the general presentation of materials: design requirements, format, navigation, the use of graphics and - for World Wide Web design - multimedia. For purposes of this document, "multimedia" means the integration of some combination of text, images, audio and video. Emphasis should be placed on the user's experience with the media when designing materials for electronic publication. Individual topics related to information design include design requirements, format, customer service (includes navigation), and multimedia (includes use of graphics). Each of these content-related topics has its own individual chapter containing further information.

Rationale: Good design requirements are prerequisite to planning, developing and implementing a successful electronic information dissemination through the Internet.

Issues:
This topic needs coverage of design requirements that are focused to developers of electronic information.

References:
Chapter on Customer Service, for information on navigation

19. DESIGN REQUIREMENTS

Description:
Design requirements provide standardization, stability and continuity to the development processes and the resulting electronic documents. For example, the adoption of standardized design features can provide a common "look and feel" to electronic documents. The "common look and feel" is typically thought of as a benefit for users moving between the various agency information services. However, it also offers consistency to developers, which simplifies planning and creating electronic documents, as well as training for staff and users. Developers also benefit from well defined requirements that can be used like 'blueprints' for development.

Different mechanisms exist for capturing design requirements, including information models, specifications, or drawings that show page layouts. Design requirements define user needs, desired outcomes, parameters and constraints that apply to building a product. For electronic information, design requirements should address customer service considerations that affect design, special user navigation requirements, laws that apply, format requirements, graphics requirements, requirements for content and the source of the content, and implementation and technology requirements.

Requirements: >

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1. Agencies must develop internal standards for design requirements that identify procedural and documentation requirements for designing electronic material and meet statewide IRM and electronic dissemination requirements.

Recommendations:

1. Agencies should create specifications, and/or models, to show how Internet pages are designed, how information is linked between documents, and the relationships between converted documents and their sources.

20. DESIGN FORMAT

Description:
Design format addresses the shape, size, and general layout of documents within a document or information service. Format also includes any specific formatting or styles that an agency selects to present its information for electronic dissemination.

Requirements:

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1. A state agency must develop standards for the design, format and display of electronic documents. The standards must consider that a variety of access capabilities are required, such as Telnet, Gopher and World Wide Web, and those required by law (i.e., the Americans with Disabilities Act).
2. Agencies must protect the integrity of their information and must communicate about its timeliness and accuracy. For electronic documents, the following descriptive elements must be present:

- Title of document
- Name of responsible organization and general contact information
- Name of author or appropriate credits

- Date published, electronically released, update information/schedule
- Required notices or important disclaimers

Recommendations:

1. Documents created for World Wide Web distribution should be formatted for, and compatible with, a variety of browsers to ensure the widest access possible. Browsers with limited features and text-only versions should also be supported.
2. Document formats should be tested for printability by users.
3. When using technology tools to create or present documents, use standard products and versions. Examples of standard products include standard HTML (for formatting text on World Wide Web pages) and ASCII (standard text format recognized by most existing technologies). Statewide technical standards should also be consulted, when applicable.
4. Use of a non-proportional font, like Courier, will allow best access for most systems and browsers.
5. Documents should be designed for availability through a variety of Internet services (i.e., Telnet, Gopher, WWW with/without graphics, etc.). Some refer to this capability as "scaleability". In terms of Open Systems definitions, "scaleability" is defined as the characteristic of being modular and extensible, usually referring to "scaling" applications from one 'size' platform to another (i.e., mainframe to PC). The way this relates to Internet is that some services, such as Telnet, reside on mainframe computers, while others can reside on PC's. Also, some applications have capacity and speed for handling graphics, while others do not.

References:
Appendix: State of Minnesota References, Related Standards and Guidelines

21. DESIGN MULTIMEDIA

Description:
For the purposes of this document, 'multimedia' means the integration of two or more of the following features: text, images, audio and video. In the Internet environment, multimedia requires software support on both the server and the user's computer. Some additional hardware requirements may also exist, depending on the features. Currently in the Internet environment, multimedia is largely available only through the World Wide Web. It is anticipated that Gopher servers will soon provide similar capabilities.

Internet use of multimedia is an area that will continue to grow and evolve. As new servers and technologies are developed, new multimedia design issues will surface. These issues, and the considerations they raise, vary based on the type of multimedia objects in use. Generally multimedia objects are contained in large computer files. The larger the file, the greater the likelihood it will exceed the limits of what some users can access, or what technologies can process within a reasonable time. For example, bandwidth limitations affect the size of files that can be transferred over phone lines. Bandwidth problems arise if large amounts of data are transferred from or to a site using the Internet.

The level of data flow that causes concern will vary from one organization to another based on the type of information transmitted, the network capacity, and the applications.

In the multimedia arena, design and technology are interdependent because design components depend on technology for their delivery. While multimedia options offer visual and audio interest and provide a unique identity for WWW information services, technological constraints must be considered in the design of an agency's information service.

Recommendations:

1. Restrict the use of graphic images to those that serve a functional purpose.
2. Limit the number of images on any one page in the interest of efficient retrieval time.
3. Restrict the size, number of colors used, and complexity of images. Smaller images can be displayed with an option for the user to retrieve a full-size image.
4. Avoid the exclusive use of images for links to other documents. Browsers that do not support graphics cannot access the linked document if an image is the only option. Graphic images should have an associated text link for these browsers.
5. Browsers that do not support graphics cannot interpret images that may be imbedded within text, such as the use of bullet icons in an outline. Instead select an outlining mechanism that is supported by browsers.
6. When providing large document files (greater than 32K) users should be informed before the item is selected. This can be done by including the file size next to the menu item.
7. Agencies should optimize information to minimize the general data traffic.
8. Agencies should test their information service at different modem connection speeds.

INFORMATION DELIVERY TOPICS:

22. INFORMATION DELIVERY

Description:
Information delivery includes server hardware and software, user hardware and software, security (general), security technology, implementation and tools, use of technical standards, and system monitoring and privacy. Each topic has its own chapter within this document.

23. SERVER HARDWARE AND SOFTWARE

Description:
To make information available on the Internet, an agency's information must reside on a computer, called a server, that is connected to the Internet. The computer may be owned and operated by the agency itself, or the agency may share/rent space on servers that are established by multiple organizations or non-government Internet providers.

Servers that will be connected to the Internet - and used to provide information and services on the Internet - will require special software. Software specifically designed for Internet servers is available. In some cases the software is free and can be downloaded from the Internet. Commercial software is also available from various vendors.

Servers have names that indicate what Internet services they provide. A World Wide Web (WWW) server, for example, would have HTML (Hyper Text Markup Language) available. HTML is the programming language that provides document formatting commands for "marking up" documents. HTML allows users to create their own Internet "pages" for publication on the WWW. Formatted versions of HTML documents can be viewed with a WWW browser.

A Gopher server, on the other hand, allows users to create and access ASCII (a universal text format) files from electronic folders arranged in a hierarchy structure. Gopher servers also offer a number of interactive features used by Gopher-specific browsers. Gopher servers may also have some HTML files, though they do not have the capabilities of a WWW server.

The capability of a computer and network to move data quickly from computer to computer, or across a network, is an important consideration when planning for Internet use. Bandwidth is one measure of capability to move information. Because bandwidth constraints affect the design of features associated with multimedia, this topic is covered in the chapter on multimedia.

Accessibility for multiple users is a critical concern in using the Internet. Consideration should be given to customer technology and network capability in selecting software to support Internet use. The software should allow accessibility for users with different kinds of access capabilities. For example, a program called "Lynx" is available that automatically replaces graphics in text material with an "[image]" notation rather than the image itself. This allows customers who do not have graphics display technology to still receive the text material. The HTML language used on many Internet servers allows the user to display special text instead of graphics.

Requirements:

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1. State of Minnesota open standards for technology apply to technology for Internet use.

Recommendations:

1. Agencies should determine the hours and days that a server will be available. Many organizations find that a server needs to be available 24 hours a day, 7 days a week. Availability should be based on business need, customer need and available support resources.
2. Internet servers should generally be located on a dedicated computer, particularly if the volume of Internet activity is large. Generally servers should not be located on an individual employee's workstation. An exception might be if the employee's primary job is managing the server.
3. Decisions about owning an Internet server and server software should be analyzed based on

agency and customer need and financial and support resources available.

4. Agencies should test their Internet information and service offerings at different Internet connection speeds to determine what is appropriate.
5. Agencies should develop techniques that will optimize the use of computer and network capacity and reduce data traffic where appropriate.
6. Agencies should be aware of the variety of technologies, network and software capabilities that customers may have as plans are made for providing information and services using Internet. Customer accessibility should be an important consideration in hardware and software selection for Internet information and service providers.

References:
See also:
Appendix: State of Minnesota References: Related Standards and Guidelines
"Future Minnesota Information Architecture" (available on the Internet)

24. USER HARDWARE AND SOFTWARE

Description:
Individuals using the Internet to receive information or services will need to have appropriate hardware and software in their work areas. In general, the hardware needed for Internet use is a personal computer that is connected to the Internet either through a modem, through a local area network, or through a mainframe connection.

The personal computer must have software on it that is specifically designed to work on the Internet. This software is called "client" software and is designed to interact with the software on an Internet server. A client browser is what is used to access information on WWW and Gopher. Full function WWW browsers with some Gopher functionality are currently used by most individuals accessing the Internet. These browsers present WWW and Gopher pages to the user. Some examples of WWW browsers are Mosaic, Netscape, WinWeb and others. Most browsers have table driven options that connect the browser to other software which presents images, audio, movies, electronic mail, and other services to the user. Recent revolutions in browser design and function demonstrate the dramatic rate of change in this area. It is important to note that some users are limited to Gopher access through Gopher specific browsers. In these cases, the user may only access files from Gopher servers. In other cases, users reach text-only versions of a WWW/Gopher document via Telnet (VT100 terminal access).

Requirements:

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1. State of Minnesota open standards for technology apply to technology for Internet use.

Recommendations:

1.

Agencies should analyze user requirements, hardware capabilities and client software capabilities before selecting particular hardware and client software.

References:
See also:
Appendix: State of Minnesota References: Related Standards and Guidelines
"Future Minnesota Information Architecture" (available on the Internet)

25. SECURITY (GENERAL)

Description:
There are three main areas of security of specific concern for Internet that must be addressed, **physical, network** and ***data integrity and privacy***. Physical security should include separating the host computer so that threats to the information are minimized. Specific measures to consider include keeping machines in locked spaces, requiring passwords for machine access, and having reliable back-up/recovery procedures. ***Network*** security must balance between providing access to the intended audience and protecting other machines on the same network. Consideration should be given to having Internet servers physically disconnected from local area networks or placing servers on the other side of a"firewall." Security provisions for data ***integrity and privacy*** address the 'Five Great Questions of Data Exchange:

1. What was sent / received?
2. Who sent / received it?
3. When was it sent / received?
4. Did an unauthorized person read it?
5. How can I prove all of the above?

According to Minnesota law (Section 13.05, subd. 5) government agencies must establish appropriate security safeguards for all records containing data on individuals. Therefore procedural and policy aspects of managing and maintaining a security program should also be considered an important part of a security solution.

Security risks must be considered when accessing or disseminating information through the Internet. The media has widely publicized Internet security risks, but often without adequate analysis. It is not possible to eliminate all risks, however it is important to balance the risks that do exist with responsible actions.

Hackers are computer users who take pride in their expertise and competence at accessing computer systems. Crackers pride themselves on their ability to wreck havoc on local or remote systems, including transmitting computer "viruses." Both exist and pose a potential threat that should be recognized and dealt with in a systematic manner. However, the biggest threats to Internet security (and hence to local systems connected to the network) are poor management and inadequate user training. The weakest link in the Internet security is a poorly managed local host which can be used as a platform for attacks on the entire network.

Security vulnerabilities can also exist in the underlying communications network and its nodes, in the Internet protocols, in network administration, or in host systems. Both information providers and users need to have confidence in security of data and activities on network. Network managers need to protect and assure the confidentiality, integrity and availability of information systems and data.

NOTE: Data integrity security is covered in the section, "Security Technology".

Requirements:

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1. Server administration policies and procedures are required.

Recommendations:

1. Agencies should provide training for network administrators and users on Internet security.
2. All general security policies and requirements for information resource management apply to activities involving the Internet.
3. Servers should not be made accessible to the public without standard security checks.
4. Special requirements of telecommuters, if any, should be included in security plans.
5. All networks exposed to traffic to or from the Internet should be subject to regular virus protection procedures.

Issues:
It has been suggested that a security alert team be established. Suggested responsibilities of this team include: monitoring advisories and communicating them to network administrators, establishing procedures for reporting and responding to security problems, and identifying technology solutions for network security. The team would provide leadership in managing Internet security issues, and related training for network administrators and users. There would ideally be an incident response team on-call at all times.

However it is unclear where such a team would fit organizationally, whether at the state level, at an agency level, or associated with server locations.

References:
See also:
Security Technology chapter
"A Network User's Guide to Security" by Ray Kermode of the Intertechnologies Group
Appendix: Legal References State of Minnesota References:
Appendix: State of Minnesota References: Related Standards and Guidelines and Research Reports Developed for the State of Minnesota

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