Hypertext: What Is All the Hype About?

An Honors Thesis (ID 499)

by

Pamela S. Wallace

Thesis Director

Ball State University

Muncie, Indiana

May, 1988

Expected date of graduation: Spring, 1988
Project Outline:

As I approached the end of my senior year and was ready to enter the field of information systems, I decided that my senior honors thesis would be a good opportunity for me to explore an emerging technology. While the idea of using hypertext to store and retrieve information is not a new concept, it is a new technology that has only emerged in the last few years with the development of the personal computer.

To learn more about hypertext, I divided my thesis into four sections. In the first section I wrote a short research paper to familiarize myself with the concept of hypertext. In the second section, I reviewed seven software packages that are currently being used to create hypertext systems. I was able to experiment with three of these packages, and my comments regarding them are included in this section. In the third section, I created a hypertext application by putting parts of my thesis into a hypertext system using the Guide software package. Last, I reviewed the contents of my thesis to summarize what I have learned from conducting this project.
SECTION ONE

Introduction—What is Hypertext?

Hypertext is an unfamiliar term to most people. However, as we rely on personal computers more and more to store and access information, the importance of hypertext will become more evident. Until recently, due to the limited amount of information personal computers could manage, there was little need to address the issue of hypertext. But today, as personal computer technology improves and new storage technologies such as CD-ROM, interactive videodiscs, and optical storage begin to emerge, the applications for hypertext will abound.

Hypertext, in its simplest form, provides a nonlinear way of storing and retrieving information. Using hypertext, authors can create a network of information linked by pointers or cross-references. "With a true hypertext system you can read an entry, jump automatically to other related entries, find cross-references to these entries, and easily jump back to the first entry."1 Unlike traditional databases, movement in a hypertext system is not rigidly constrained by a hierarchy, but is determined by the user's own mental associations. Reading with hypertext is open-ended, with the path determined by the needs and interest of the user.

Perhaps more important than the development of hypertext is the emergence of hypermedia in the last few years. Hypermedia is

---

multimedia hypertext with the ability to link text, graphics, animation, sound or motion video.

Many of the software packages available today which claim to have hypertext capabilities actually have hypermedia capabilities, and are even more powerful than strict hypertext applications. Some of these packages include Guide which integrates text and graphics, and HyperCard which integrates text, graphics, and sound. The idea of hypertext is not a new one, but the technology to fully utilize hypermedia has been developed only recently.

The word "hypertext" was coined in 1965 by Ted Nelson, who predicted that "hypertext software would allow us to freely explore information in multiple paths, instead of being confined to a fixed path or structure."² Nelson attributed his idea of hypertext to Vannevar Bush, who in his classic 1945 article "As We May Think," explained that our existing information systems are based on rigid hierarchical indexing schemes. He stated, "The human mind does not work that way. It operates by association. With one item in its grasp, it snaps instantly to the next that is suggested by the association of thoughts."³

Bush proposed a "memex" system that would store the full text of books, memos, articles, and other information. Memex would give both the author and the reader a way to build a trail

³Ibid.
through the maze of information available to them. Bush prophetically visualized that a system such as Memex would provide a way to deal with the growing amount of research, and would replace antiquated methods of storing and retrieving information.

Bush's Memex system was the first proposed hypertext system. The technology to implement such a system was not available until the mid 1960's. Douglas Engelbart, the head of a computer lab at the Stanford Research Institute, introduced the first known hypertext system in 1968. This system, called NLS (oN Line System), ran on a mainframe and allowed researchers and other users to create sophisticated links between documents for applications such as technical documentation and shared scientific research. NLS introduced innovations such as the mouse, and multiple windows which are the basis for many hypertext applications today.

Today, several software applications use the concept of hypertext to store and access information in a nonlinear form. One very popular application is Apple's HyperCard, a free-form database-management system. Lotus's Agenda, touted as a personal-information manager, offers advanced retrieval and linking capabilities derived from hypertext. Guide, from Owl International Inc., offers hypertext search capabilities to both the Macintosh and MS-DOS systems. Other software products that offer hypertext capabilities include Houdini from MaxThink Inc.,
Ize from Persoft Inc., askSam from Seaside Software Inc. and AffiniFile from Affinity Microsystems Ltd.

Applications of Hypertext Software

Hypertext software has many useful applications that are being utilized by corporations, governmental organizations, and educational institutions. At its simplest level, hypertext can be used by individuals as a free-form personal information system. However, the most productive applications of hypertext are in providing individuals or large groups of people access to large amounts of information. Some examples of these types of applications include: technical documentation, automated maintenance systems, computer-based training, three-dimensional education, reader-defined information delivery, and on-line help systems.⁴

Using hypertext, innovative automated maintenance systems can replace repair manuals. An example is the Service Bay Diagnostic System (SBDS) developed by Hewlett-Packard and Ford Motor Company that will utilize an expert system, CD-ROM, and hypertext to diagnose and repair cars.⁵ SBDS utilizes Guide, a hypertext software developed by Owl International, Inc. Guide gives the SBDS system instant access to the approximately 100 megabytes of information for each car. While still in the

⁵Ibid. p. 2.
testing phase, this new system should support all new Ford cars and trucks by the early 1990's.

Computer-based training is another application of hypertext that is gaining widespread use. Hypertext can provide a fast and cost-effective way to provide computer-based training to non-programmers. An example is Pathmac, a state-of-the-art hypertext project created at Cornell University Medical College.\(^6\) Currently, the entire second-year curriculum has been put online. Pathmac allows medical students to weave their way through the maze of curriculum information available to them at their own pace and in a form much more digestible than standard methods.

Other educational institutions using hypertext for interactive educational purposes include the University of Mississippi's School of Veterinary Medicine and the University of Toledo, which is developing a hypertext-based course in Spanish literature.\(^7\) Hypertext can provide a three-dimensional interactive mix of text and graphics for educational materials, that allow students to explore information at their own pace and leisure. Instead of spending hours browsing through useless information, hypertext allows users to zoom in on exactly what it is they need.

Hypertext is also being utilized for governmental documentation. The U.S. Environmental Protection Agency uses


\(^7\)Applications of Guide--Backgrounder., p. 2.
Guide software developed for the Macintosh to help state and local agencies, companies, and others access and understand complex regulations concerning over two million underground gasoline storage tanks in the U.S. The United States Senate used askSam, a software package with a hypertext facility, to store testimony and evidence compiled during the Iran-Contra hearings.

**Problems with Hypertext**

While many believe that hypertext will transform the way we think about and store information, there are some who still remain skeptical about its usefulness. Because hypertext software is a new concept, some problems do exist which merit attention.

To the average user, the idea of hypertext may seem complex and even overwhelming. Stephen Manes quotes in *PC Magazine*, "Hypertext has everything it takes: a catchy sound, the promise of better days ahead, and the potential for total confusion." Hypertext offers many paths for the user to follow. Manes, however, claims that more often than not, hypertext leads the user down a "blind alley." "Sooner or later there are so many paths users end up spending most of their time guessing which

---

8Ibid. p. 3.

ones might actually be useful."¹⁰ John Dvorak claimed in a recent issue of MacUser that hypertext is profoundly antiuser, because you can never find out whether the essential fact you are looking for might be hidden down some alternate route or concealed under some text you did not move the cursor over.¹¹

Supporters of hypertext claim that paper is a two-dimensional medium, while hypertext allows three-dimensional links among data. Edward Mendelson claims that the opposite is true. "The computer screen is a two-dimensional medium with rigid limits on the amount of data it displays at one time."¹² He claims that a printed book is the real three-dimensional medium because you can hold it open at two or three different places, flip quickly from one point to another, and keep a dozen other books open on the desk and on the floor.

Whether hypertext is two-dimensional or three-dimensional, it has already proved more effective than a printed book for storing vast amounts of complex information, such as repair manuals. However, creating documents using hypertext can be challenging. Creating the links between documents can be a problem with hypertext. Humans must create these links, and humans are not perfect. If the indexer leaves something out when creating the initial links, the user will find it only through

¹⁰Ibid.


¹²Ibid.
browsing, and with a large hypertext system, this can be very time consuming.

Assembling a hypertext system may be difficult if one cannot visualize or understand how hypertext documents are linked. Creating documents using hypertext is quite different from conventional writing, and it is possible to end up with a confusing, maze-like tangle of links. Neil Larson, creator of a hypertext software called Houdini, calls this spaghetti hypertext. Because creating a system from scratch can be so difficult, most users will utilize hypertext to explore or add to existing documents, rather than create their own.

Another limitation of hypertext is that long blocks of text do not work well in a hypertext system. Since the user can exit the main document at any time, he/she is likely to do so at the first symptom of boredom. For this reason, some claim that hypertext is not a good medium for in-depth documents or documents that express more than one idea.

**Future of Hypertext**

The personal computer can be used to solve many problems, but it has also brought about a problem, the information overload problem. The PC has not brought about the paperless office like many thought it would, instead it has just given us a faster and easier way to create more and more paper.

Hypertext is one answer to the information overload problem created by the widespread use of computers. Hypertext allows
users to sift through large amounts of data, to find exactly what they are looking for. With a hypertext system, users do not have to search sequentially through information, but can zoom in on exactly what it is they are looking for.

The significance of hypertext is that it goes beyond the traditional linear approach to storing information. Hypertext allows pieces of information to be linked in a network that allows for faster retrieval through a minimum of keystrokes.

A hypertext system allows the user to create electronic documents, unlike a word processing system, in which the goal is to create paper documents. A hypertext document can be read from the screen and need never leave the computer.

Because hypertext can be used to create electronic documents, its future applications are limited only by technology. Hypertext documents can be transmitted electronically from one PC to another or can be transmitted over telephone lines using telecommunication technology.

Other technological developments such as CD-ROM and optical disks will allow more widespread use of hypertext in the future. Storing information in a hypertext system can consume large amounts of storage space. While most hypertext software packages will run on floppy disks, large data files can be accessed most conveniently from a hard disk. Even larger data files, such as those used for expert systems, will require optical disks or CD-ROM disks. As the cost of these types of storage devices
decreases in the future, hypertext will surely gain more widespread use.

Another development that will increase the number of applications for hypertext is the idea of stackware. As mentioned earlier, the average user of hypertext will probably not have the time or patience that it takes to link hypertext documents. The developers of hypertext software realize this, and have begun pushing the idea of "stackware."

One of the first commercial stacks is Activision's "Business Class." It is a Hypercard stack that provides currency, climate, local customs and other travel information for most countries in the world. Computer hobbyists have taken to the idea of stackware, and one mail-order software distributor lists 100 Hypercard stacks. The development of stacks for the hypertext software packages that are on the market today will make hypertext much more attractive to users in the future.

One of the most far-reaching applications for hypertext technology is the Xanadu Project, the brainchild of Ted Nelson, who coined the term hypertext in 1965. Xanadu is a proposed worldwide hypertext information-retrieval system. It would provide computer users with instant access to all books, papers, music and pictures.

The long-term goal for Xanadu is to make software for the

---

"world library." A version of the software went on-line in January, 1987, and is being accessed by a small number of computer researchers for experimental purposes. Possible applications for the Xanadu software range from academic to office-automation. The Xanadu group is positive there is a huge market for their software, which will allow users to get at their information in ways that they can deal with.

The future of hypertext looks promising. The widespread use of PC's, the development of mass storage devices, and development of hypertext stackware will all make hypertext a very popular and useful information-retrieval system.

---

SECTION TWO

Software Review

The following section is a review of seven software packages presently on the market with hypertext capabilities. They include: Apple's HyperCard, Guide from OWL International, Houdini from MaxThink, askSam from Seaside Software, IZE from Persoft, Lotus's Agenda, and AffiniFile from Affinity Microsystems, Ltd.

As I reviewed the literature concerning hypertext, these were the software packages most often mentioned. For each package, I have listed the hardware requirements, given a brief description of its capabilities, and reviewed any extra features available, and any limitations to its capabilities.

Some of the software packages have very powerful hypertext capabilities, while others only claim to be personal information managers with "hypertextlike" capabilities. Some of the packages are available on the Macintosh only, some on MS-DOS systems, and one is available on both the Macintosh and IBM compatible PC's. They range in price from giveaway packages bundled with the purchase of new Macintoshes (Apple's HyperCard) to $445 for Persoft's IZE. The price, however, does not always reflect the power and capabilities available with each package.

For three of the software packages I reviewed, I was able to actually experiment with the software. These included HyperCard, Guide and Houdini. In these reviews, I have included my reaction to the software package in the comments section.
Hypertext Software Review

Name: Hypercard
Company: Apple Computer, Inc.
List Price: $49, free with all new Macintoshes purchased

Hardware Requirements:
Macintosh Plus, Macintosh SE or Macintosh II
At least one megabyte of memory (2 megabytes of memory when using Hypercard with other applications under MultiFinder)
Preferably one 800K disk drive and one hard-disk drive. Limited use with two 800K disk drives.

Description:
Bill Atkinson who wrote HyperCard describes it as a "software erector set" that allows even nonprogrammers to write their own programs. HyperCard uses the concept of index cards to store information in the form of text, graphics, or sounds. Related cards are grouped together in stacks. Buttons are used to link cards and to perform other tasks, such as dialing a phone or printing a report.

Features:
HyperCard allows information to be organized by association and context as well as by hierarchy. Built-in stacks and templates enable the user to create applications such as an address file, a datebook, to do lists, and filing systems. An on-line help system gives users immediate reference information and assistance.

HyperCard uses the familiar Macintosh interface and powerful tools to manipulate text, graphics and buttons, allowing users to
customize their own stacks and templates. HyperCard allows users to import other Macintosh files such as MacWrite and MacPaint.

HyperTalk, an English-like scripting language lets users write their own scripts (euphemism for programs) to give directions to buttons or external devices such as videodisc players and CD-ROM drives. HyperTalk is what gives HyperCard so much power and flexibility. It offers as much programming capability as the user is prepared to use.

HyperCard can be placed in the category of hypermedia, as opposed to purely hypertext. Creation of interactive multimedia presentations is possible through the integration of not only text and graphics, but also video, sound, voice, and animation.

An advantage of HyperCard is that several applications have already been developed for it. These applications, known as stacks or stackware, provide users of HyperCard with even more power and flexibility. One example is Focal Point from Activision, which when used with HyperCard, helps busy executives, or any one else for that matter, organize appointments, addresses, expenses, projects, etc. It is designed to help users customize their own applications for HyperCard.

Another stack available to HyperCard users is Business Class, also from Activision. It is a travel planning tool for executives. Unlike Focal Point which requires the user to input all the information, Business Class comes already loaded with information on airports, time zones, and local customs. Focal Point is available for $99.95, while Business Class retails for $49.95.
Limitations:

The size of each card is limited to the size of the Macintosh Plus screen. HyperCard currently only allows the display of one card at a time. It also only allows one-way links between cards. This means that the user can find everything a particular card leads to, but not the cards that lead to it. Two-way links are necessary for assembling reference lists and removing pieces of information from a file.

Comments:

After experimenting with HyperCard for a short time, I was very pleased with its familiar Macintosh interface, which made it very user friendly. In a short amount of time, I became familiar with most of HyperCard's capabilities.

HyperCard proves most effective for storing small bits of information, such as addresses, phone lists, appointments, and notes. However, the limitation on the size of each card would probably not make it very useful for long documentation, which is where I think hypertext's greatest capabilities lie. Hypertext provides users with the ability to sift through large amounts of information as quickly as possible, and with as few keystrokes as possible. HyperCard does these things, but it does not really take advantage of the ability of hypertext to store massive amounts of information.
Hypertext Software Review

Name: Guide
Company: OWL International Inc.
List Price: $199.95 for the Macintosh
           $275.00 for the IBM PC or compatible for use with
           MICROSOFT Windows 2.0 or higher

Hardware Requirements:
  Mac: 512K Mac, Mac Plus, XL or II with two disk
     drives, or one floppy drive and a hard disk.

  IBM: IBM PC-AT, or compatible or PS/2 Model 50,60,
     or 80 with at least 640K of RAM, graphics
     monitor and card, a 1.2 megabyte floppy disk drive
     (or 3 1/2" drive on the PS/2), hard disk and
     mouse.

Description:

OWL International, Inc. claims Guide to be the first
commercially available hypertext system for personal computers.
Guide allows users to retrieve information through the use of
buttons embedded in documents. These buttons link items within a
document, as opposed to HyperCard which links notecards. Each
Guide file consists of a single document which may contain text
as well as graphic images.

Guide documents, or Guidelines as they are called, may
contain three buttons, each indicated by a special symbol which
changes in shape as the cursor is passed over the text or images.
Reference buttons display reference points in other parts of the
same Guideline or in another Guideline. Note buttons display
more detailed notes about the text or image being discussed,
serving the same purpose as footnotes in a paper document.
Replacement buttons substitute existing passages with new ones.
Features:

Guide features a built-in word processor. It also accepts text from other word processors, such as Microsoft Windows Write, as well as electronic mail that the user has downloaded. Documents can incorporate graphics created with Microsoft Windows Paint, Micrographx Windows "DRAW!," or any other graphics program that supports the Windows Clipboard.

Guide also features an on-line help system which allows users to add their own notes about specific programs or functions. Guide allows users to cross reference different help files, making them available at the click of the mouse.

Guide's backtracking command keeps track of the last 32 commands the user initiated. This helps users get back on track if they are just browsing through a Guideline, and they drift away from their original topic.

The command buttons in Guide allow users to launch external programs and control devices such as videodisc players and modems. Guide also includes a Glossary command for storing frequently-used text, graphics or hypertext structures.

OWL International provides Guide users with several other programs to assist them in creating Guide documents. Guidance is a desk accessory that assists users in creating context-sensitive help systems and tutorials. The Guide Reader is a read-only version of Guide that allows Guidelines to be distributed to a number of users over a network. Guide Reader allows users to
read or print Guide documents, while preventing them from making modifications.

One of the advantages of Guide is that it allows the creation of electronic documents, as opposed to paper documents. With Guide electronic documents replace manuals and technical documentation. Managing these electronic documents can be a huge task. To help in this task, Guide has introduced IDEX, the first hypertext-based document management system. It combines high-speed hypertext browsing, searching, and structured document formatting. IDEX allows multiple users on a network to rapidly access and update massive amounts of information.

Limitations:

Guide requires the use of a mouse for all movement within Guide documents. This can aid the beginner, but experienced users can often find what they are looking for faster by using the cursor or pagedown keys on the keyboard.

The hardware requirements may also be a limitation for some users. Guide requires a lot of memory to be truly functional. The hardware requirements as well as the price place it in a category for very serious users of hypertext. While Guide was the first commercially available hypertext system, Hypercard was the first to offer hypertext capabilities to Macintosh users for a very low price. For this reason, Apple seems to be stealing some of the attention away from OWL's Guide.
**Comments:**

After using Guide, I found it to be very user-friendly. It features pull-down menus, which make creating Guidelines very easy. After experimenting with Guide for about half an hour, I was able to begin creating a Guideline using the buttons feature of Guide to link information. The sample Guideline documents which are included with Guide explain the three types of Guide buttons, the pull down menus, and how to get started creating your own Guideline.

The Guide manual was also very easy to understand, and well organized. Guide is structured, however, so that you can start out experimenting and learn just as much or more than you can from the manual. The manual just serves as a good reference to explain Guide commands in greater detail.
Hypertext Software Review

Name: Houdini
Company: MaxThink, Inc.
List Price: $89 for Houdini
           $89 for HyperLink

Hardware Requirements:
IBM PC or compatible
256K of memory

Description:

Houdini is a hypertext system that links units of information in a powerful network. MaxThink, Inc. calls it a network processor. Each unit or topic in Houdini can link to as many as 2,500 others units or dimensions. Houdini can support up to as many as 7,000 links in one file. A Houdini topic may contain a word, paragraph, filename, or graphic image. Houdini automatically links repeated information.

Features:

Houdini can be thought of as a text processor, frame processor, and link processor. As a text processor, Houdini includes commands for editing, moving, and printing text. As a frame processor, Houdini divides single topics into multiple linked topics, categorizes, and cross-references information. As a link processor, Houdini links together related frames into a network of information. Houdini includes 14 different ways of linking text or frames and eight different ways of displaying link relationships. HyperLink, another hypertext utility from
MaxThink, is used to split up large Houdini files and cross-reference related files.

Houdini also includes many more commands for sorting, prioritizing, classifying, and referencing information.

Limitations:

While Houdini does allow PC-Paint, PC-Paintbrush, and Applause graphics files to be displayed, it is best suited for text storage and retrieval. Neil Larson, creator of Houdini, emphasizes Houdini's browsing capabilities. Houdini allows users to find what they are looking for with a limited amount of keystrokes.

Unlike HyperCard and Guide, Houdini does not feature pull-down menus. Therefore, it takes the beginner a little bit longer to figure out exactly how Houdini works, especially if you just start experimenting before reading the manual.

Comments:

One of the greatest advantages of Houdini is that it brings the power of hypertext to an 8088 PC, and does not require a lot of memory to operate. It emphasizes the nonlinear concept of hypertext.

While Houdini is a very powerful tool for creating hypertext links between documents, it is not quite as easy to create the links in Houdini as it is in other hypertext products. Because Houdini does not contain pull-down menus, it is not quite as "friendly" as Guide or HyperCard.
The following software reviews are based solely on information obtained from literature or from the developers of the software itself. I was unable to experiment with these packages because the software was unavailable to me. Therefore, it was hard for me to determine all the limitations with each software package. Since most of my information was obtained from the software developers, it tended to be a little biased toward all the dazzling features of hypertext, and not the limitations of the software.
Hypertext Software Review

Name: askSam 4.0
Company: Seaside Software
List Price: $295
$55 for upgrade from 3.0
$105 for upgrade from 2.0

Hardware Requirements:
IBM PC, PS/2, XT, AT and compatibles
256K memory, 1 floppy drive

Description:
askSam is an information storage and retrieval system for use with both textual and numeric information. askSam's hypertext capabilities allow users to create menus of askSam files, programs, and retrieval requests. Its free-form design allows the creation of databases that permit movement between files with no file boundaries.

Features:
Retrieval of information from askSam files may be based upon any combination of words or symbols. askSam allows for the retrieval of an entire document or just one sentence. askSam's own command language allows complicated requests to be stored as programs for easier recall. askSam's backtracking command remembers the users last 100 or so moves. A context-sensitive on-line help facility is available from anywhere in askSam, and may be revised to suit the needs of the user.

A full-screen text editor allows for data entry and for editing of existing records. askSam also features a report
generator for output of text and numerical data. askSam also has
the ability to exchange ASCII files with other systems.

An additional feature includes automatic phone dialing from
a list of phone numbers stored in an askSam file for computer
systems with a modem.

Limitations:

At present, askSam has no built-in mouse support, and does
not support graphics. It is most useful, therefore, for text-
intensive databases.
Hypertext Software Review

Name: IZE
Company: Persoft, Inc.
List Price: $445

Hardware Requirements:
- IBM PC XT, AT, PS/2 or compatible system
- 512K RAM minimum
- Hard disk and single floppy drive required for full functionality; limited use on systems with two high-density floppy drives.

Description:

Persoft calls IZE an advanced management program that allows the user to organize and rapidly retrieve unstructured information. The information managed by IZE is stored in texts. A collection of related texts is called a textbase. In all texts, certain words are designated as keywords.

When IZE is requested to find information, it automatically generates an outline, which is organized into groups based on the number of texts that share the same keywords.

IZE provides four major environments in which to work. They include the Word Processor, the Workspace, Outlines and Guidelines. The Word Processor allows the user to create texts within IZE or manipulate documents that have been imported into IZE.

The Workspace can be compared to a desktop with a number of different documents and folders on it. It allows the user to quickly work with and switch between texts in memory without making new search requests.
Outlines provide a summary of all information requested by the user, and new outlines are generated each time the user makes a search request. Outlines can be expanded to deeper and deeper levels of detail.

Guidelines are custom-made forms that allow the user to control the shape of outlines. This function allows the user to create outlines which are different from the ones that IZE automatically provides.

Features:

IZE features a built-in word processor, as well as the ability to import documents from most word processors and ASCII format files. Like most other hypertext software packages, it features a context-sensitive help system.

Searches can be conducted for words that have not been designated as keywords. Fuzzy searches allow the user to search for keywords when unsure of correct spelling.

Limitations:

IZE is a textbase management and organization system and does not support graphics. Another limitation is IZE's $445 price tag.
Hypertext Software Review

Name: Agenda
Company: Lotus Development Corporation
List Price: $395

Hardware Requirements:
IBM PC, XT, AT, PS/2 or compatible
512K RAM
Hard-disk drive is recommended
A protected-mode version will allow Agenda to run under OS/2

Description:
Lotus calls Agenda a personal information manager that allows users to manage textual data more intelligently.
Agenda allows the user to enter information in free-form text units called items. Items may be several lines long, and may have notes up to several pages long attached to them. Items are organized by the user into one or more categories.
Agenda allows the user to gain different perspectives on the information contained in the database through "views." Each view represents a different cross-section through the information. For example, one view might prioritize items while another view might arrange items by project. Items may be edited from within any view. Agenda automatically updates the links between the item and its categories in all views each time a change is made.

Features:
Users can categorize notes by keywords or let the program's built-in calendar automatically sort the information by dates.
Users may enter information and organize and structure it only as they need to.

The artificial intelligence component allows users to customize the program by placing conditions on items and categories. For example, items marked "done" may be automatically archived.

Limitations:

Agenda does not support video or graphic images, and it lacks a programming language to allow users to customize their own applications.

Agenda's $395 price tag may limit its availability to some users. Lotus, however, does not seem to think that the price will slow the acceptance of Agenda. S. Jerrold Kaplan of Lotus claims that "the price tag sends a message that this is a serious piece of software." 15

Comments:

Agenda, as its name implies, will probably prove most useful for scheduling and generating calendars. While it uses hypertext concepts to link small bits of information, it is not as powerful as other hypertext systems, such as Guide and Houdini, which provide quick and easy access to much longer documents.

Hypertext Software Review

Name: AffiniFile
Company: Affinity, Inc.
List Price: $79.95

Hardware Requirements:
512K Macintosh Plus, SE, or Mac II
Two 800K disk drives or
One 800K disk drive and a hard-disk

Description:

AffiniFile is a Macintosh desk accessory that allows users to keep notes, store graphics, and retrieve information quickly. AffiniFile can be used to create customized help files, track projects, make address books, file phone calls, and organize graphic images.

AffiniFile features pull-down menus similar to those in HyperCard. Most features are accessed by clicking on icons.

AffiniFile works like a notebook storing topics and subtopics which are automatically indexed in the Topics index. Each topic may include up to 5,000 words and a full page of graphics. Each topic and subtopic may have any number of synonyms or "alias links," as AffiniFile calls them, which aid users when they are unsure of the exact topic name they are searching for.

Features:

Each disk may have many AffiniFiles, while each AffiniFile may contain anywhere from 1 to 2,000 topics. The cross-referencing function shows related topics in the "See also..."
window. The Compare feature in AffiniFile allows users to toggle between current and previous topics. AffiniFiles may be automatically stamped with the current time and date to aid in indexing topics.

"Customs" is an import/export/merge utility available with AffiniFile which allows users to merge multiple AffiniFiles into one, or import/export between Affinifile and other programs. AffiniFile can gather information as a desk accessory, then export it to another application, such as a word processor, database management system or graphics program. Conversely, the import facility makes information stored in a database accessible within AffiniFile.

Limitations:

Unlike Hypercard, I did not get the chance to experiment with AffiniFile to determine all of its capabilities. Like HyperCard, AffiniFile's main function is as a notecard manager. However, it lacks many of the powerful features of HyperCard, including a command language, which allows customization of HyperCard applications.
SECTION THREE

Hypertext Application using Guide:

For the third part of my thesis, I created a hypertext application using Guide from OWL International, Inc. I decided to put the first two sections of my thesis, the research paper and the software reviews, in hypertext form. This will allow anyone to access only the hypertext information they are interested in.

The first step was to import my paper, which I typed in WordPerfect, as a DOS text file. I named this file Hyper, and Guide automatically gave it a GUI extension. Guide allows text-only files created in other word processors to be imported into Guidelines. Then I created another Guideline, which would contain my thesis in hypertext form. I named this Thesis.Gui.

Next, I created two replacement buttons for each section of my paper. To create the first button, I highlighted SECTION ONE, then chose the Make Button command from the pull-down menu. Then I typed in four subheadings: Introduction--What is Hypertext, Applications of Hypertext, Problems with Hypertext, and Future of Hypertext.

Next, I made each subheading into a replacement button, using the Make Button command again. This time, instead of typing in the text, I decided to cut and paste it from Hyper.Gui, the DOS text file that I imported into Guide. To do this, I opened Hyper.Gui, highlighted the section titled Introduction--What is Hypertext?, and chose Cut from the Edit option. Then I
switched to Thesis.Gui, and chose Paste from the Edit option. I repeated these steps for the remaining three subheadings.

Next, I created the second button, SECTION TWO, and divided it into seven subheadings, one for each software that I reviewed. Then I made each of these subheadings into a button, and divided them up even further. Again, I used the cut and paste options to create the text behind each button.

The finished Guideline contained several buttons which would allow the reader to access the information they needed with only a few keystrokes. When the Thesis.Gui document is opened, the user sees a screen with two subheadings, or buttons. When the cursor is moved over the first button, it changes to a star shape. Each Guide button is represented by a different shape. The star-shaped button represents a replacement button, which means that if the user clicks the mouse, the button is replaced by related passages of text. If the button labeled SECTION ONE is clicked, four subheadings appear. When one of these subheadings, or buttons, is clicked, the user finds information about that particular topic.

When the second main heading, SECTION TWO, is clicked, seven subheadings or buttons appear. If the user clicks HyperCard, six more buttons appear on the screen. The user can then choose general information on HyperCard, hardware requirements, a description of HyperCard, and so on.

The following three pages show the screen layout for each of the buttons contained in Thesis.Gui. The headings in bold type
represent replacement buttons, and if clicked, they expand to give the reader more information on that topic. The headings that are not in bold type take the reader back to the previous topic when clicked.
SECTION ONE
Research Paper

SECTION TWO
Software Review
SECTION ONE--Research Paper
Introduction--What is Hypertext?
Applications of Hypertext
Problems with Hypertext
Future of Hypertext

SECTION TWO--Software Review
HyperCard
Guide
Houdini
askSam
Ize
Agenda
AffiniFile
SECTION TWO--Software Review

HYPERCARD

General Information

Hardware Requirements

Description

Features

Limitations

Comments
SECTION FOUR

Project Summary:

After completing this thesis, I believe that hypertext is a concept that will be very important to the field of information systems in the future. Because hypertext allows users to find information so much quicker than traditional databases, it has many useful applications. But because hypertext is such a new concept, many people are not yet aware of these applications.

Only recently has the idea of hypertext been in the spotlight, and I think that is due to the increased use of the personal computer. As personal computers are upgraded and allow the storage of more and more information through the use of CD-ROM and other mass storage devices, I think hypertext will become a very popular way of storing information.

The whole idea behind hypertext is that it allows information to be stored in a non-linear form. Since this is the way most people think, I believe this is an appropriate way to store and access information.

I probably learned the most about hypertext from actually experimenting with the three software packages. I learned that creating hypertext documents is a lot easier said than done. To create an application in hypertext form, one must forget about the traditional database approach, and think in a "non-linear" fashion. This requires the creator of a hypertext document to think about how information is related, and link those related ideas in such a way that readers can jump from one idea to
related ideas without seeing the actual links. This network of linked ideas should be invisible to the reader, and should allow the reader to retrieve the desired information in as few keystrokes as possible.

While only a few software packages offer hypertext capabilities today, as the concept becomes more popular, more competitors will enter the hypertext market. In addition, the existing hypertext packages will continue to be upgraded to offer users more and more hypertext power.
BIBLIOGRAPHY


BIBLIOGRAPHY (cont.)


