

**GOVERNMENT ARTS AND SCIENCE COLLEGE, KOMARAPALAYAM
DEPARTMENT OF COMPUTER SCIENCE**

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UNIT-I

Multimedia definition – use of multimedia- Delivering Multimedia. Text: About font and faces - Using text in Multimedia – Computers and Text-Font Editing and Design tools- Hypermedia and Hypertext.

CHAPTER –1: MULTIMEDIA DEFINITION

What Is Multimedia?

Multimedia is any combination of text, art, sound, animation, and video delivered by computer or other electronic or digitally manipulated.

- It is richly presented sensation.
- The sensual elements of multimedia—dazzling pictures and animations, engaging sounds, compelling video clips, and raw textual information.
- each element of multimedia and learning one or more tools for creating and editing that element.
- Get to know how to use text and fonts, how to make and edit colorful graphic images and animate them into movies, and how to record and edit digital sound.
- Producing a multimedia project or a web site requires more than creative skill and high technology.
- They need organizing and business talent as well.
For example, issues of ownership and copyright will be attached to some elements that you wish to use, such as text from books, scanned images from magazines, or audio and video clips.

Definition

- Multimedia is a combination of digitally manipulated text, photographs, graphic art, sound, animation, and video elements.
- End user—also known as the viewer of a multimedia project—to control what and when the elements are delivered, it is called **interactive multimedia**.
- A structure of linked elements through which the user can navigate, interactive multimedia becomes **hypermedia**.
- Each multimedia element stands up and dances, but also need to know how to use multimedia computer tools and technologies to weave them together.
- The people who weave multimedia into meaningful tapestries are called **multimedia developers**.
- The project may also be a page or site on the World Wide Web, where you can weave the elements of multimedia into documents with **HTML** (Hypertext Markup Language) or **DHTML** (Dynamic Hypertext Markup Language) or **XML** (eXtensible Markup Language) and play rich media files created in such programs as Adobe’s Flash, LiveMotion, or Apple’s QuickTime by installing plug-ins into a browser application such as Internet Explorer, Safari, Google Chrome, or Firefox.
- Browsers are software programs or tools for viewing content on the Web.
- A multimedia project need not be interactive to be called multimedia: users can sit

back and watch it just as they do a movie or the television.

- In such cases a project is **linear**, or starting at the beginning and running through to the end.
- When users are given navigational control and can wander through the content at will, multimedia becomes **nonlinear** and user interactive, and is a powerful personal gateway to information.
- Determining how a user will interact with and navigate through the **content** of a project requires great attention to the message, the scripting or **storyboarding**, the artwork, and the programming.
- Multimedia elements are typically sewn together into a project using **authoring tools**.
- These software tools are designed to manage individual multimedia elements and provide user interaction.
- **Integrated multimedia** is the “weaving” part of the multimedia definition, where source documents such as montages, graphics, video cuts, and sounds merge into a final presentation.
- The viewer on a monitor is the **graphical user interface**, or GUI (pronounced “gooey”).
- The GUI is more than just the actual graphics on the screen—it also often provides the rules or structure for the user’s input.
- The hardware and software that govern the limit are the **multimedia platform or environment**.

Where to Use Multimedia

- Multimedia is appropriate whenever a human user is connected to electronic information of any kind, at the “human interface.”
- Multimedia enhances minimalist, text-only computer interfaces and yields measurable benefit by gaining and holding attention and interest; in short, multimedia improves information retention.
 - **Multimedia in Business**
 - **Multimedia in Schools**
 - **Multimedia at Home**
 - **Multimedia in Public Places**
 - **Virtual Reality**

Multimedia in Business

- Business applications for multimedia include presentations, training, marketing, advertising, product demos, simulations, databases, catalogs, instant messaging, and networked communications.
- Voice mail and video conferencing are provided on many local and wide area networks (LANs and WANs) using distributed networks and Internet protocols.
- Multimedia is enjoying widespread use in training programs. Flight attendants learn to manage international terrorism and security through simulation.
- Drug enforcement agencies of the UN are trained using interactive videos and photographs to recognize likely hiding places on airplanes and ships.

- Medical doctors and veterinarians can practice surgery methods via simulation prior to actual surgery.
- Mechanics learn to repair engines.
- Salespeople learn about product lines and leave behind software to train their customers.
- Fighter pilots practice full-terrain sorties before spooling up for the real thing.

Increasingly easy-to-use authoring programs and media production tools even let workers on assembly lines create their own training programs for use by their peers.

- Multimedia around the office has also become more commonplace.
- Image capture hardware is used for building employee ID and badging databases, scanning medical insurance cards, for video annotation, and for real-time teleconferencing.
- Presentation documents attached to e-mail and video conferencing are widely available.
- Laptop computers and high- resolution projectors are commonplace for multimedia presentations on the road.
- Mobile phones and personal digital assistants (PDAs) utilizing Bluetooth and Wi-Fi communications technology make communication and the pursuit of business more efficient.
- Advertising the public image of the business as an investor in technology.

Multimedia in Schools

- Schools are perhaps the destination most in need of multimedia.
- Many schools in the United States today are chronically underfunded and occasionally slow to adopt new technologies.
- The U.S. government has challenged the telecommunications industry to connect every classroom, library, clinic, and hospital in America to the information superhighway.
- The students, not teachers, become the core of the teaching and learning process.
- E-learning is a sensitive and highly politicized subject among educators, so educational software is often positioned as “enriching” the learning process.
- From real-time echocardiographic images to explanations of the chemistry of synaptic transmission, multimedia is used as an effective teaching medium in medicine and other disciplines.
- Students can put together interactive magazines and newsletters, make original art using image-manipulation software tools, and interview students, townspeople, coaches, and teachers.
- They can even make video clips with cameras and mobile phones for local use or uploading to YouTube.
- They can also design and run web sites.
- As schools become more a part of the Internet, multimedia arrives by glass fiber and over a network ITV (Interactive TV) is widely used among campuses to join students from different locations into one class with one teacher.
- Remote trucks containing computers, generators, and a satellite dish can be dispatched to areas where people want to learn but have no computers or schools near them.

- In the online version of school, students can enroll at schools all over the world and interact with particular teachers and other students.

Multimedia at Home

- From gardening, cooking, home design, remodeling, and repair to genealogy software, multimedia has entered the home.
- Home consumers of multimedia own either a computer with an attached CD-ROM or DVD drive or a set-top player that hooks up to the television, such as a Nintendo Wii, X-box, or Sony PlayStation machine.
- There is increasing convergence or melding of computer-based multimedia with entertainment and games-based media traditionally described as “shoot-em-up.”

Multimedia in public places

- In hotels, train stations, shopping malls, museums, libraries, and grocery stores, multimedia is already available at stand-alone terminals or kiosks, providing information and help for customers.
- Multimedia is piped to wireless devices such as cell phones and PDAs.
- From a supermarket kiosk that provides services ranging from meal planning to coupons.
- Hotel kiosks list nearby restaurants, maps of the city, airline schedules, and provide guest services such as automated checkout.
- Printers are often attached so that users can walk away with a printed copy of the information.
- Museum kiosks are not only used to guide patrons through the exhibits, but when installed at each exhibit, provide great added depth, allowing visitors to browse through richly detailed information specific to that display.

Virtual Reality

- At the convergence of technology and creative invention in multimedia is virtual reality, or VR. Goggles, helmets, special gloves, and bizarre human interfaces attempt to place you “inside” a lifelike experience.
- VR requires terrific computing horsepower to be realistic.
- In VR, your cyberspace is made up of many thousands of geometric objects plotted in three-dimensional space: the more objects and the more points that describe the objects, the higher the resolution and the more realistic your view.
- As you move about, each motion or action requires the computer to recalculate the position, angle, size, and shape of all the objects that make up the view, and many thousands of computations must occur as fast as 30 times per second to seem smooth.
- On the World Wide Web, standards for transmitting virtual reality worlds or scenes in VRML (Virtual Reality Modeling Language) documents (with the filename extension .wrl) have been developed.
- Intel and software makers such as Adobe have announced support for new 3-D technologies.
- Using high-speed dedicated computers, multi-million-dollar flight simulators built by

Singer, RediFusion, and others have led the way in commercial application of VR.

- Virtual reality (VR) is an extension of multimedia—and it uses the basic multimedia elements of imagery, sound, and animation.

Delivering Multimedia

- Multimedia requires large amounts of digital memory when stored in an end user's library, or large amounts of bandwidth when distributed over wires, glass fiber, or airwaves on a network.
- The greater the bandwidth, the bigger the pipeline, so more content can be delivered to end users quickly.

- **CD-ROM, DVD, Flash Drives**
- **The Broadband Internet**

CD-ROM, DVD, Flash Drives

- CD-ROM (compact disc read-only memory) discs can be mass-produced for pennies and can contain up to 80 minutes of full-screen video, images, or sound.
- The disc can also contain unique mixes of images, sounds, text, video, and animations controlled by an authoring system to provide unlimited user interaction.
- Discs can be stamped out of polycarbonate plastic as fast as cookies on a baker's production line and just as cheaply.
- Many systems also come with a DVD player combination that can read and burn CD-ROMs as well.
- Multilayered Digital Versatile Disc (DVD) technology increases the capacity and multimedia capability of CDs to 4.7GB on a single-sided, single-layered disc to as much as 17.08GB of storage on a double-sided, double-layered disc.
- CD and DVD burners are used for reading discs and for making them, too, in audio, video, and data formats.
- DVD authoring and integration software allows the creation of interactive front-end menus for both films and games.
- CD-ROM and DVD discs are but interim memory technologies that will be replaced by new devices such as flash drives and thumb drives that do not require moving parts.
- As high-speed connections become more and more pervasive and users become better connected, copper wire, glass fiber, and radio/cellular technologies may prevail as the most common delivery means for interactive multimedia files, served across the broadband Internet or from dedicated computer farms and storage facilities.

The Broadband Internet

- These days telecommunications networks are global, so when information providers and content owners determine the worth of their products and how to charge money for them, information elements will ultimately link up online as distributed resources on a data highway (actually more like a toll road), where you will pay to acquire and use multimedia-based information.
- The actual glass fiber cables that make up much of the physical backbone of the data highway are, in many cases, owned by railroads and pipeline companies who simply buried

the cable on existing rights of way, where no special permits and environmental studies are necessary.

- Full-text content from books and magazines is downloadable, feature movies are played at home; real-time news feeds from anywhere on earth are available; lectures from participating universities are monitored for education credits; street maps of cities are viewable—with recommendations for restaurants, in any language—and online travelogues include testimonials and video tracks.
- Interactive multimedia is delivered to many homes throughout the world.
- Entertainment companies that own content easily converted to multimedia projects are teaming up with cable TV companies.
- Film studios are creating new divisions to produce interactive multimedia and wealthy talents have formed new companies to join in on the action.
- Google is scanning millions of books and periodicals.
- Even without a clear business model with known profits, large media corporations are uniting to create huge conglomerates to control the content and delivery of tomorrow's information.

CHAPTER 2: TEXT

Definition

- Using text and symbols for communication is a very recent human development that began about 6,000 years ago in the Mediterranean Fertile Crescent—Mesopotamia, Egypt, Sumeria, and Babylonia.
- The earliest messages delivered in written words typically contained information vital to the management of people, politics, and taxes.
- Text and the ability to read it are doorways to power and knowledge. Reading and writing are expected and necessary skills within most modern cultures.
- In contrast to today's television medium, which consists of sound and images with a few text headlines “dumbed down” to the level of a perceived lowest common denominator of passive audience.
- A trick in the Google search engine is to type in “site:” and the name of a domain. Google will tell you how many pages from that domain are indexed:



- As bandwidth improves and more information is successfully embedded within these documents.
- Words and symbols in any form, spoken or written, are the most common system of communication. They deliver the most widely understood meaning to the greatest number of people.

The Power and Irregularity of English

- English is the official or joint official language of more than 75 countries.
- The most recent changes in English spelling have been driven by technology limits as SMS (Short Message Service) text messages commonly used by social networking sites such as Twitter and Facebook to communicate and “tweet” allow only about 160 characters per message (140 bytes).
- As today’s most pervasive method of human-to-human data communication users speaking many languages quickly developed word shortcuts to pack the most meaning into the fewest characters.
- NetLingo (www.netlingo.com) maintains a list of almost two thousand English acronyms and instant messaging jargon words such as XOXO (hugs & kisses), U (you), and NME (enemy).
- A **typeface** is a family of graphic characters that usually includes many type sizes and styles.
- A **font** is a collection of characters of a single size and style belonging to a particular typeface family. Typical font styles are boldface and italic.
- Computer software may add other style attributes, such as underlining and outlining of characters.
- **Type sizes** are usually expressed in points; one point is 0.0138 inch, or about 1/72 of an inch.
- The **font’s size** is the distance from the top of the capital letters to the bottom of the descenders in letters such as g and y. Helvetica, Times, and Courier are typefaces; Times 12-point italic is a font.
- A font’s size does not exactly describe the height or width of its characters. This is because the **x-height** (the height of the lowercase letter x) of two fonts may vary, while the height of the capital letters of those fonts may be the same.
- Computer fonts automatically add space below the descender (and sometimes above) to provide appropriate line spacing, or **leading** (pronounced “ledding,” named for the thin strips of lead inserted between the lines by traditional typesetters).

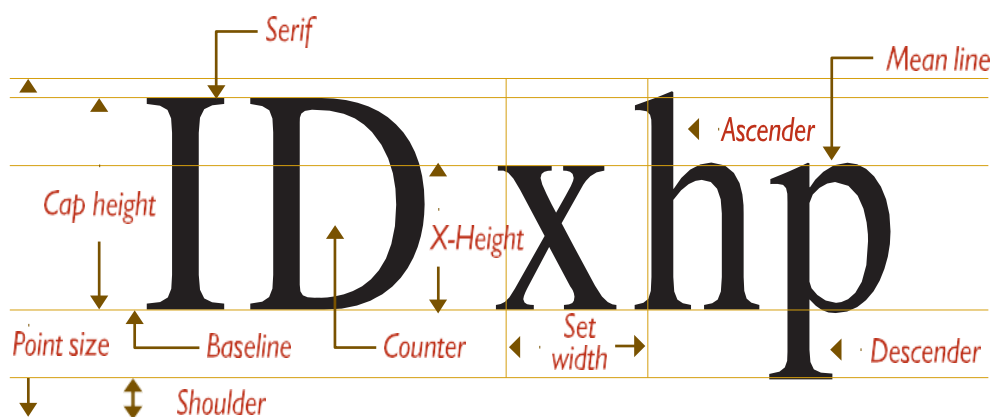


Figure 2-1 The measurement of type

- Leading can be adjusted in most programs on both the Macintosh and the PC.
- Character metrics are the general measurements applied to individual characters; **Kerning** is the spacing between character pairs.

- When working with PostScript, TrueType, and Master fonts—but not bitmapped fonts—the metrics of a font can be altered to create interesting effects.
- For example, you can adjust the body width of each character from regular to condensed to expanded, as displayed in this example using the Sabon font, **three** categories
 - **Regular**
 - **Condensed**
 - **Expanded**

- Adjust the spacing between characters (tracking) and the kerning between pairs of characters:

Tighter Track	Av	Av
Looser Track	Kerned	Unkerned

- When it converts the letter A from a mathematical representation to a recognizable symbol displayed on the screen or in printed output (a process called **rasterizing**), the computer must know how to represent the letter using tiny square **pixels** (picture elements), or dots.
- High-resolution monitors and printers can make more attractive-looking and varied characters because there are more fine little squares or **dots per inch** (dpi).
- The same letter can look very different when you use different fonts and faces:



Cases

- In centuries when type was set by hand, the type for a single font was always stored in two trays, or cases; the upper tray held capital letters, and the lower tray held the small letters.
- A capital letter is called upper- case, and a small letter is called lowercase.
- In some situations, such as for passwords, a computer is **case sensitive**, meaning that the text’s upper- and lowercase letters must match exactly to be recognized.
- But nowadays, in most situations requiring key- board input, all computers recognize both the upper- and lowercase forms of a character to be the same. The computer is said to be **case insensitive**.
- Placing an uppercase letter in the middle of a word, called an **intercap**, is a trend that emerged from the computer programming community, where coders discovered they could better recognize the words they used for variables and commands when the words were lowercase but intercaptioned.

About Fonts and Faces

Serif vs. Sans Serif

- Typefaces can be described in many ways.

- Type has been characterized as feminine, masculine, delicate, formal, capricious, witty, comic, happy, technical, newsy—The approach uses the terms serif and sans serif.
- Serif versus sans serif is the simplest way to categorize a typeface; Notice the difference between serif (on the left) and sans serif:
- On the printed page, serif fonts are traditionally used for body text because the serifs are said to help guide the reader's eye along the line of text.



- Sans serif fonts, on the other hand, are used for headlines and bold statements. But the computer world of standard, 72 dpi monitor resolution.
- WYSIWYG (What You See Is What You Get) is more of a goal than an absolute fact

Using Text in Multimedia

- A single item of menu text accompanied by a single action (a mouse click, keystroke, or finger pressed to the monitor) requires little training and is clean and immediate.
- Use text for titles and headlines (what it's all about), for menus (where to go), for navigation (how to get there), and for content (what you see when you get there).

Designing with Text

- Computer screens provide a very small workspace for developing complex ideas.
- To deliver high-impact or concise text messages on the computer screen in as condensed a form as possible.
- Creating presentation slides for public-speaking support, the text will be keyed to a live presentation where the text accents the main message.
- In this case, use bulleted points in large fonts and few words with lots of white space.

Choosing Text Fonts

- Picking the fonts to use in multimedia presentation may be somewhat difficult from a design standpoint. Here are a few design suggestions that may help:
 - For **small type**, use the most legible font available. Decorative fonts that cannot be read are useless, as shown at right.
 - Use as **few different faces** as possible in the same work, but vary the weight and size of your typeface using italic and bold styles where they look good. Using too many fonts on the same page is called **ransom-note typography**.
 - **Vary the size of a font** in proportion to the importance of the message you are delivering.

- In **large-size headlines**, adjust the spacing between letters (kerning) so that the spacing feels right. Big gaps between large letters can turn your title into a toothless waif. You may need to kern by hand, using a bitmapped version of kjthe text.
 - Explore the effects of **different colors** and of placing the text on various backgrounds. Try reverse type for a stark, white-on-black message.
 - **Use anti-aliased text** where you want a gentle and blended look for titles and headlines. This can give a more professional appearance. Anti-aliasing blends the colors along the edges of the letters (called dithering) to create a soft transition between the letter and its background.
 - **Drop caps** (like the T to the left) and **initial caps** to accent your words. Most word processors and text editors will let you create drop caps and SMALL CAPS in your text. Adobe and others make initial caps (such as the one shown to the right from Adobe, called Gothic).

The letters are actually carefully drawn artwork and are available in special libraries as encapsulated PostScript files (EPSF).

- ✓ Coding an initial cap for a web page is simple. Use **CSS** attributes:

```
p:first-letter { font-size: 200%; } p:first-line { line-height: 100%; }
```

- ✓ **Centered type** in a text block, keep the number of lines and their width to a minimum. For attention-grabbing results with single words or short phrases,
- ✓ **Experiment with drop shadows.** Place a copy of the word on top of the original, and offset the original up and over a few pixels.
- ✓ **Pick the fonts**
- ✓ **Use meaningful words or phrases for links and menu items.** Text links on web pages can accent your message: they normally stand out by color and underlining. Use link colors consistently throughout a site, and avoid iridescent green on red or purple on puce.
- ✓ **Bold** or emphasize text to highlight ideas or concepts, but do not make text look like a link or a button when it is not.
- ✓ On a **web page**, put vital text elements and menus in the top 320 pixels. Studies of surfer habits have discovered that only 10 to 15 percent of surfers ever scroll any page.

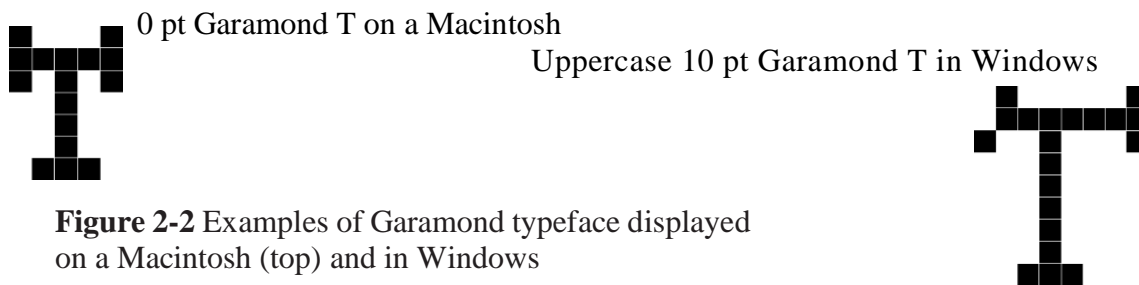


Figure 2-2 Examples of Garamond typeface displayed on a Macintosh (top) and in Windows

Installed Fonts

- ✓ Before use a font, it must be recognized by the computer's operating system.
- ✓ To use fonts other than those installed with your basic operating system, need to install them.
- ✓ Use of Cascading Style Sheets (CSS), preferred over the deprecated HTML tag, allows you to be quite precise about font faces, sizes, and other attributes (see Table 2-1)

Color	color	Sets the color of text
direction	ltr rtl	Sets the text direction. Use with Unicode-bidi property
line-height	normal	Sets the distance between lines
	number	
	length	
	%	
letter-spacing	normal length	Increases or decreases space between characters
text-align	left	Aligns the text in an element
	right	
	center	
	justify	
text-decoration	none	Adds decoration to text
	underline	
	overline	
	line-through	
	blink	
text-indent	length %	Indents the first line of text in an element
text-shadow	none color length	
text-transform	none	Controls the letters in an element

	capitalize	
	uppercase	
	lowercase	
unicode-bidi	normal	Use for languages that run from left
	embed	to right or both. Works with direction
	bidirectional-override	Property
	inherit	
vertical-align	baseline	Sets the vertical alignment of an
	sub	Element
	super	
	top	
	text-top	
	middle	
	bottom	
	text-bottom	
	length	
	%	

Table 2-1 Available Text Properties Using Cascading Style Sheets (CSS)

Property	Value	Description
white-space	normal pre nowrap	Sets how white space inside an element is handled
word-spacing	normal length	Increases or decreases space between words

Table 2-1 Available Text Properties Using Cascading Style Sheets (CSS)

Animating Text

- There are plenty of ways to retain a viewer’s attention when displaying text.

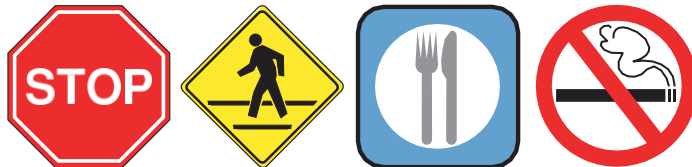
For example, you can animate bulleted text and have it “fly” onto the screen. It can “grow” a headline a character at a time.

- For public speakers, simply highlighting the important text works well as a pointing device.

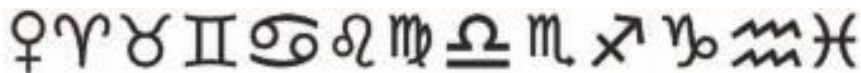
Symbols and Icons

- Symbols are concentrated text in the form of stand-alone graphic constructs. Symbols convey meaningful messages.
- The hourglass cursor tells you to wait while the computer is processing. multimedia you should treat them as text—or visual words—because they carry meaning. Symbols such as the familiar trash can and hourglass are more properly called icons:
- Certainly text is more efficient than imagery and pictures for deliver- ing a precise message to users.

Here are some symbols you may already know:



•



Still in heavy use by astrologers, they represent the 12 constellations of the zodiac:

- ✓ When early computers began to display bitmaps as well as lines of text, there was a flurry of creative attempts by graphic artists to create interest- ing navigational symbols to alleviate the need for text.
- ✓ The screens were pure graphic art and power—all lines and angles and stunning shadows. While this storage medium has been relegated to museums, the iconic meaning persists.

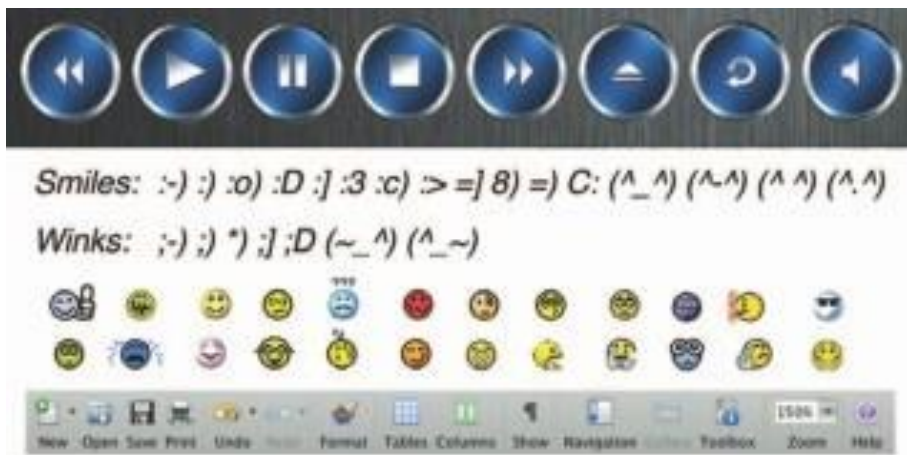


Figure 2-4 Some symbols, like Play, Pause, and Fast Forward, are easily recognized but may still be more precise with text titles. “Smiley” symbols, or emoticons, used in Internet conversation to express mood, once were made up entirely of text and punctuation characters. These have been replaced by both custom-made graphic symbols and official type characters as part of the international Unicode library (Block 1F600..1F64F). Indeed, sometimes it’s difficult to know what a smiley really means! □

Menus for Navigation

- An interactive multimedia project or web site typically consists of a body of information, or content, through which a user navigates by pressing a key, clicking a mouse, or pressing a touch screen.
- The simplest menus consist of text lists of topics. Users choose a topic, click it, and go there.

For example, if there are three words on a computer screen, the typical response from the user, without prompting, is to click one of these words to evoke activity.

- Text is helpful to users to provide persistent cues about their location within the body of content. When users must click up and down through many layers of menus to reach their goal.
- TO Taken (all the way from the beginning) is continuously displayed, the user can at any time skip intervening steps in a nonlinear manner or easily return to one of the previous locations in the list.

Tomatoes

Red

Massachusetts

President

Chest

Arrested

- The more locations included in the menu list, the more options available for navigation. On the Web, designers typically place on every page at least a Main Menu of links that offers the user a handhold and mechanism for returning to the beginning. Often they will also place a list, such as

Home > Store > Home & Garden > Patio & Grilling > Gas Grills & Accessories > Gas Grills > Burners

Buttons for Interaction

- In most modern cultures a doorbell is recognized by its context (next to the door itself, possibly lit); but if you grew up in a high-rise apartment, may have seen 50 or more buttons at the entrance.
- In multimedia, buttons are the objects, such as blocks of text, a pretty blue triangle, or a photograph, that make things happen when they are clicked.
- Properties such as highlighting or other visual or sound effects to indicate that you hit the target.

- On the Web, text and graphic art may be buttons. Buttons and the art of button design and human interaction/Choose from many styles of buttons and several standard methodologies for highlighting.
- Experiment to get the right combinations of font, spacing, and colors for just the right look.
- In most authoring platforms, it is easy to make own buttons from bitmaps or drawn objects.
- In a message-passing authoring system, script activity when the mouse button is up or down over an object, quickly replace one bitmap with another highlighted or colored version of the bitmap to show that the button has been “pushed” or that the mouse is hovering over it.
- Making own buttons from bitmaps or drawn objects gives greater design power and creative freedom and also ensures against the missing font problem.
- It can also implement these graphic image rollovers on web pages, using JavaScript to replace the image when there is a MouseOver or hover event; when a MouseUp event occurs on the image, the user can be directed to another page.
- Typically the destination address (URL) is displayed in the status bar of the browser when the mouse is over a linked image or text element.
- So users know first if the mouse is over an active button and second, where that button will take them if they click.

Fields for Reading

- Design text to be read on the screen.
- Experiments have shown that reading text on a computer screen is slower and more difficult than reading the same text in hard-copy or book form.
- Many users, it seems, would rather print out their reports and e-mail messages and read them on paper than page through screens of text. Reading hard copy is still more comfortable.
- Web site is to display large blocks of text, try to present to the user only a few paragraphs of text per page.

Portrait vs. Landscape

- **Traditional hard-copy and printed documents in the taller-than-wide orientation are simply not readable on a typical monitor with a wider-than-tall aspect ratio. The taller-than-wide orientation used for printed documents is called **portrait**; this is the 8.5-by-11-inch size unique to the United States or the internationally designated standard A4 size, 8.27 by**



inches.

- The wider-than-tall orientation normal to monitors is called **landscape**.
- There are four possible solutions if you are working with a block of text that is taller than what will fit”
- ✓ **Put the text into a scrolling field.** This is the solution used by web browsers.
 - ✓ **Put the text into a single field or graphic image** in a project window, and let the user move the whole window up or down upon command. This is most appropriate when you need to present text with page breaks and formatting identical to the printed document. This is used by Adobe’s popular Acrobat Reader for displaying PDF files.
 - ✓ **Break the text into fields that fit on monitor-sized pages,** and design control buttons to flip through these pages.
 - ✓ **Design your multimedia project** for a special monitor that is taller than it is wide (portrait) or a normal monitor rotated onto its side. Dedi- cated “page view” monitors are expensive; they are used for commercial print-based typesetting and layout. Video controllers can rotate the text display for you:

eBooks, E-Readers, and Tablet Computers

- eBooks are books digitized and formatted to be read using an eReader. eReaders display text, graphics, and multimedia— most using E Ink screens between five and ten inches diagonal, some with touch screens, some with wi-fi and 3G connectivity, and all with varying and sometimes non-standard input formats (see Table 2-2).
- Among eBook devices are the Apple iPad, Arrow, Astak EZ Reader, Barnes & Noble Nook, BeBook Neo, COOL-ER, Cybook, Foxit eSlick, iLiad, iRex Digital Reader,

Jetbook, Kindle, and the Sony Reader.

Plain text	.txt
HTML	.html
PostScript	.ps
Portable Document Format	.pdf
DjVu	.djvu
EPUB	.epub
FictionBook	.fb2
Mobipocket	.prc, .mobi
Kindle	.azw
eReader	.pdb
Broadband eBook	.lrf, .lrx
WOLF	.wol
Tome Raider	.tr2, .tr3
ArghosReader	.aeh
Microsoft Reader	.lit
Multimedia eBook	.exe

Table 2-2 E-Readers Can Read Many File Formats, Some Proprietary

- The **e-Ink screen** is a technology for “electronic paper,” designed to imitate the appearance of ordinary ink on paper (see sidebar).
- e-Ink displays can be used in direct sunlight and boast a long battery life. But e-Ink is not required to read eBooks, which can be viewed on most computers and many Personal Digital Assistants (PDAs) and mobile phones using format converting/reading software such as Adobe Digital Editions.

HTML Documents

- The standard document format used for displaying text pages on the Web is called Hypertext Markup Language (HTML).
- In an HTML document you can specify typefaces, sizes, colors, and other properties by “marking up” the text in the document with tags.
- The process of marking up documents or “styling” them is simple: Where you want text to be bold, surround it with the tags `` and `` or `` and ``; the text between the tags will then be displayed by your browser application in bold type. Where you have a header, surround it with `<H1>` and `</H1>`; for an ordered list of things (1, 2, 3,

... or a, b, c, ..., etc.), surround your list with `` and ``. There are many tags you can use to lay out a page. Cascading Style Sheets (CSS) work in conjunction with HTML and provide fine tuning and control of text and layout.

- HTML Version 5 is a redesign that stretches into a multimedia delivery tool, making HTML no longer just a text display tool with assorted attachments and plugged-in objects.
- A new `<canvas>` element allows a box to be defined on a web page in which 2-D graphics can be drawn under program control.
- Video and audio (timed media) playback is supported. Still, HTML doesn't provide with much flexibility to make pretty text elements, which are often done as graphical bitmaps placed within the HTML document's layout with image tags, ``, or incorporated into Flash animation files.

Computers and Text

- Very early in the development of the Macintosh computer's monitor hardware, Apple chose to use a resolution of 72 pixels per inch.
- This matches the standard measurement of the printing industry (72 points per inch) and allows desktop publishers and designers to see on the monitor what their printed output will look like (WYSIWYG).
- In addition, Apple made each pixel square-shaped, providing even measurements in all directions. Until the Macintosh was invented, and the VGA video standard set for the PC (at 96 pixels per inch), pixels were typically taller than they were wide.
- The aspect ratio for a pixel on older EGA monitors, for example, is 1.33:1, taller than it is wide. VGA and SVGA monitor resolutions for both Macintosh and Windows display pixels at an aspect ratio of 1:1 (square).

The Font Wars Are Over

- In 1985, the desktop publishing revolution was spearheaded by Apple and the Macintosh computer, in combination with word processing and page layout software products that enabled a high-resolution 300 dpi laser printer using special software to "draw" the shapes of characters as a cluster of square pixels computed from the geometry of the character.
- This special software was the Adobe PostScript page description and outline font language. It was licensed by Apple and included in the firmware of Apple's LaserWriter laser printer.
- PostScript is really a method of describing an image in terms of mathematical constructs (Bézier curves), so it is used not only to describe the individual characters of a font but also to describe entire illustrations and whole pages of text.
- Because each PostScript character is a mathematical formula, it can be easily scaled bigger or smaller so it looks right whether drawn at 24 points or 96 points, whether the printer is a 300 dpi LaserWriter or a high-resolution 1200, 2400, or even 3600 dpi image setter suitable for the finest print jobs.
- And the PostScript characters can be drawn much faster than in the old-fashioned way.
- Before PostScript, the printing software looked up the character's shape in a bitmap table containing a representation of the pixels of every character in every size.
- PostScript quickly became the de facto industry font and printing standard for desktop

publishing and played a significant role in the early success of Apple's Macintosh computer.

- ✓ There are two kinds of PostScript fonts:
 - Type 3
 - Type 1

Type 3: font technology is older than Type 1 and was developed for output to printers; it is rarely used by multimedia developers. There are currently over 6,000 different Type 1 typefaces available.

Type 1: fonts also contain hints, which are special instructions for grid-fitting to help improve resolution. Hints can apply to a font in general or to specific characters at a particular resolution.

- In **1989**, Apple and Microsoft announced a joint effort to develop a “better and faster” quadratic curves outline font methodology, called **TrueType**
- In addition to printing smooth characters on printers, True- Type would draw characters to a low-resolution (72 dpi or 96 dpi) monitor.
- TrueType was based on Apple technology, it was licensed to Microsoft.
- Adobe and Microsoft then developed a new and improved font management system incorporating the best features of both PostScript and TrueType, and by **2007**.
- **OpenType** became a free, publicly available inter- national standard. The font wars were over

Font Foundries

- Typefaces are created in a foundry, a term much like case, that has carried over from times when lead was poured into molds to make letter faces.
- There is also a special interest group (SIG) at America Online (go to Computing:Software Libraries:Desktop & Web Publishing Forum:Fonts).

Character Sets and Alphabets

- Create and use special and custom-made characters will broaden your creative range when you design and build multimedia projects.

The ASCII Character Set

- The American Standard Code for Information Interchange (ASCII) is the 7-bit character coding system most commonly used by computer systems in the United States and abroad.
- ASCII assigns a number or value to 128 characters, including both lower- and uppercase letters, punctuation marks, Arabic numbers, and math symbols.
- Also included are 32 control characters used for device control messages, such as carriage return, line feed, tab, and form feed.
- ASCII code numbers always represent a letter or symbol of the English alphabet, so that a computer or printer can work with the number that represents the letter,
- To a computer working with the ASCII character set, the number 65, for example, always represents an uppercase letter A.
- ASCII was invented and standardized for analog teletype communication early in the age

of bits and bytes.

The Extended Character Set

- A byte, which consists of eight bits, is the most commonly used building block for computer processing.
- ASCII uses only seven bits to code its 128 characters; the eighth bit of the byte is unused. This extra bit allows another 128 characters to be encoded before the byte is used up, and computer systems today use these extra 128 values for an extended character set.
- The extended character set is most commonly filled with ANSI (American National Standards Institute) standard characters, including often-used symbols, such as ϕ or ∞ , and international diacritics or alphabet characters, such as \ddot{a} or \tilde{n} .
- This fuller set of 255 characters is also known as the ISO- Latin-1 character set; it is used when programming the text of HTML web pages.

Unicode

- Computer market has become more international, one of the resulting problems has been handling the various international language alphabets.
- It was at best difficult, and at times impossible, to translate the text portions of programs from one script to another.
- Since 1989, a concerted effort on the part of linguists, engineers, and information professionals from many well-known computer companies has been focused on a 16-bit architecture for multilingual text and character encoding. Called **Unicode**, the original standard accommodated up to about 65,000 characters to include the characters from all known languages and alphabets in the world.





Figure 2-5 Writing systems currently in use around the world. Unicode provides a consistent methodology for encoding the characters of any alphabet.

- Where several languages share a set of symbols that have a historically related derivation, the shared symbols of each language are unified into collections of symbols (called **scripts**).

Mapping Text Across Platforms

- Build multimedia project on a Windows platform and play it back on a Macintosh platform (or vice versa), there will be subtle (and sometimes not-so-subtle) differences.
- Fonts are perhaps the greatest cross- platform concern, because they must be mapped to the other machine. If a specified font doesn't exist on the target machine, a substitute must be provided that does exist on the target. This is **font substitution**.
- In many cross-platform-savvy applications, you can explicitly define the font mapping. **Table 2-3 shows some typical mappings when crossing platforms.**

Mac→Win	Win→Mac
Mac:Chicago→Win:System	Win:Arial→Mac:Helvetica
Mac:Courier→Win:Courier New	Win:Courier→Mac:Courier
Mac:Geneva→Win:MS Sans Serif	Win:Courier New→Mac:Courier
Mac:Helvetica→Win:Arial	Win:MS Serif→Mac:New York
Mac:Monaco→Win:Terminal	Win:MS Sans Serif→Mac:Geneva
Mac:New York→Win:MS Serif	Win:Symbol→Mac:Symbol Map None

Mac:Symbol→Win:Symbol Map None	Win:System→Mac:Chicago
Mac:Times→Win:Times New Roman (sizes: 14→12, 18→14, 24→18, 30→24)	Win:Terminal→Mac:Monaco
Mac:Palatino→Win:Times New Roman	Win:Times New Roman→Mac:Times (sizes: 12→14, 14→18, 18→24, 24→30)

Table 2-3 Typical Mappings for Common Macintosh and Windows Fonts

Languages in the World of Computers

- In modern Western languages, words are made up of symbols or letters strung together, representing as a whole the sounds of a spoken word.
- The letters or symbols of a language are its alphabet. In English, the alphabet consists of 26 Roman or Latin letters; in Japanese, the kanji alphabet comprises more than 3,000 kanas, or whole words.
- The Russian alphabet, made up of Cyrillic characters based on the ancient Greek alphabet, has about the same number of letters as the Roman alphabet..
- Translating or designing multimedia (or any computer-based material) into a language other than the one in which it was originally written is called **localization**. This process deals with everything from the month/ day/year order for expressing dates to providing special alphabetical characters on keyboards and printers.

Special Characters in HTML

- In HTML, character entities based upon the ISO-Latin-1 standard make up the alphabet that is recognized by browser software on the World Wide Web.
- All of the usual characters of an English keyboard are included (the 7-bit ASCII set is built in), but for the extended character set that includes tildes, umlauts, accents, and special symbols, must use an escape sequence to represent them in an ISO-Latin-1 HTML document.
- A character entity is represented either by a number or by a word and is always prefixed by an ampersand (escape) and followed by a semicolon.

For example, the name for the copyright symbol is “copy” and its number is 169. The symbol may be inserted into a document either as © or as ©—either way, the character © is generated by the browser.

- The list of character entities allowed in standard HTML is growing and will soon include mathematical symbols and even icons to represent things like trash cans, clocks, and disk drives. Word processors

Multilanguage Web Pages

- When building a project in more than one language for the Web, consider translating the languages that use Roman fonts and displaying them as text in the browser in the normal way.
- Languages other than English may have many escaped characters
- For the web page, the translator can then capture a screen image of the translated text, and embed that image into the web page.
- This process takes precise coordination among the designers, the content providers, and the translators, but it can be done smoothly with careful labeling of the bits and pieces.

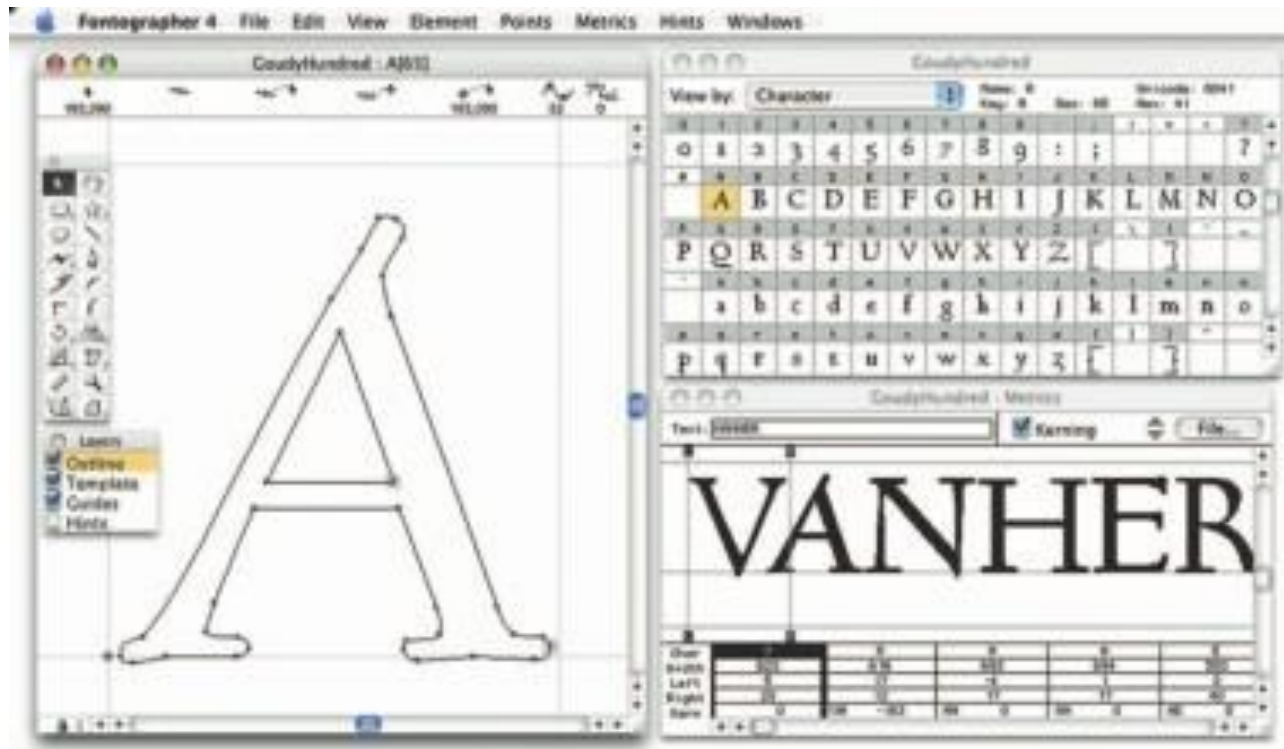
Font Editing and Design Tools

- Special font editing tools can be used to make your own type, so you can communicate an idea or graphic feeling exactly.
- With these tools, professional typographers create distinct text and display faces.
- Graphic designers, publishers, and ad agencies can design instant variations of existing typefaces.
- Typeface designs fall into the category of industrial design and have been determined by the courts in some cases to be protected by patent

For example, design patents have been issued for Bigelow & Holmes' Lucida, ITC Stone, and Adobe's Minion.

Fontlab

- **Fontlab, Ltd.**, located at www.fontlab.com, specializes in font editors for both Macintosh and Windows platforms.
- Use this software to develop PostScript, TrueType, and OpenType fonts for Macintosh, Windows, and Sun workstations.
- Designers can also modify existing type- faces, incorporate PostScript artwork, automatically trace scanned images, and create designs from scratch.
- A sample of the Fontographer screen is shown in Figure 2-7.



- Fontographer’s features include a freehand drawing tool to create professional and precise inline and outline drawings of calligraphic and script characters, using either the mouse or alternative input methods (such as a pressure-sensitive pen system).
- Fontographer allows the creation of multiple font designs from two existing typefaces, and design lighter or heavier fonts by modifying the weight of an entire typeface.

Making Pretty Text

- ✓ To make your text look pretty, you need a toolbox full of fonts and special graphics applications that can stretch, shade, shadow, color, and anti-alias the words into real artwork.
- ✓ Pretty text is typically found in bitmapped drawings where characters have been tweaked, manipulated, and blended into a graphic image.
- ✓ Most designers find it easier to make pretty type starting with ready-made fonts, but some will create their own custom fonts using font editing and design tools.
- ✓ With the proper tools and a creative mind, create endless variations on plain-old type, and you not only choose but also customize the styles that will fit with your design needs.
- ✓ Most image-editing and painting applications (see Figure 2-8 for a PowerPoint example) let you make text using the fonts available in your system.
- ✓ Colorize the text, stretch, squeeze, and rotate it, and you can filter it through various plug-ins to generate wild graphic results.
- ✓ PostScript outline fonts allow text to be drawn at any size on your computer screen without jaggies:

The Jaggies

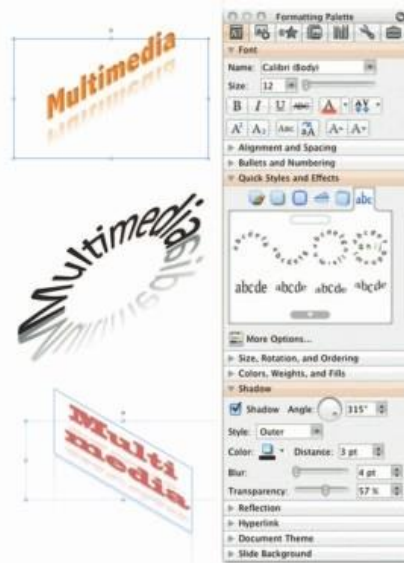


Figure 2-8 PowerPoint lets you manipulate text in many ways.

- Jaggies are avoided by anti-aliasing the edges of the text characters, making them seem smoother to the eye.
- **Problematic:** the blending pixels along the edge will show as a halo and may have to be edited pixel by pixel.
- Macintosh and PCs handle anti-aliasing differently.
- Authoring programs such as Adobe Flash allow you to fine-tune anti-aliasing settings for text fields useful when you want a different look for text that will be static versus text that will be animated.

Hypermedia and Hypertext

Multimedia—the combination of text, graphic, and audio elements into a single collection or presentation—becomes interactive multimedia give the user some control over what information is viewed and when it is viewed.

- Interactive multimedia becomes hypermedia when its designer provides a structure of linked elements through which a user can navigate and interact.
- When a hypermedia project includes large amounts of text or symbolic content, this content can be indexed and its elements then linked together to afford rapid electronic retrieval of the associated information.
- When words are keyed or indexed to other words, have a hypertext system; the “text” part of this term represents the project’s content and meaning, rather than the graphical presentation of the text.
- When text is stored in a computer instead of on printed pages, the computer’s powerful

processing capabilities can be applied to make the text more accessible and meaningful.

- The text can then be called hyper- text; because the words, sections, and thoughts are linked, the user can navigate through text in a nonlinear way, quickly and intuitively.
- Using hypertext systems electronically search through all the text of a computer-resident book, locate references to a certain word, and then immediately view the page where the word was found. Whole documents can be linked to other documents.

The Power of Hypertext

- The power of such search-and-retrieval systems provided by a computer for large volumes of data is immense, but clearly this power must be channeled in meaningful ways.
- Links among words or clusters of information need to be designed so that they make sense.
- Judgments must be made about relationships and the way information content is organized and made available to users. The lenses through which vast amounts of data

Using Hypertext

- Special programs for information management and hypertext have been designed to present electronic text, images, and other elements in a data- base fashion.
- Commercial systems have been used for large and complicated mixtures of text and images—

For example, a detailed repair manual for a Boeing 747 aircraft, a parts catalog for Pratt & Whitney jet turbine engines, an instant reference to hazardous chemicals, and electronic reference libraries used in legal and library environments. Such searchable database engines are widely used on the Web, where software robots visit millions of web pages and index entire web sites. Hypertext data- bases rely upon proprietary indexing systems that carefully scan the entire body of text and create very fast cross-referencing indexes that point.

Searching for Words

Although the designer of a hypermedia database makes assumptions, he or she also presents users with tools and a meaningful interface to exercise the assumptions. Following are typical methods for word searching in hypermedia systems:

- ✓ Categories Selecting or limiting the documents, pages, or fields of text within which to search for a word or words.
- ✓ Word relationships Searching for words according to their general proximity and order. For example, you might search for “party” and “beer” only when they occur on the same page or in the same paragraph.
- ✓ Adjacency Searching for words occurring next to one another, usually in phrases and proper names. For instance, find “widow” only when “black” is the preceding adjacent word.
- ✓ Alternates Applying an OR criterion to search for two or more words, such as “bacon” or “eggs.”
- ✓ Association Applying an AND criterion to search for two or more words, such as “skiff,” “tender,” “dinghy,” and “rowboat.”

- ✓ Negation Applying a NOT criterion to search exclusively for references to a word that are not associated with the word.
For example, find all occurrences of “paste” when “library” is not present in the same sentence.
- ✓ Truncation Searching for a word with any of its possible suffixes.
For example, to find all occurrences of “girl” and “girls,” you may need to specify something like girl#. Multiple character suffixes can be managed with another specifier, so geo* might yield “geo,” “geology,” and “geometry,” as well as “George.”
- ✓ **Intermediate words** :Searching for words that occur between what might normally be adjacent words, such as a middle name or initial in a proper name.
- ✓ **Frequency Searching for words** based on how often they appear: the more times a term is mentioned in a document, the more relevant the document is to this term.

Hypermedia Structures

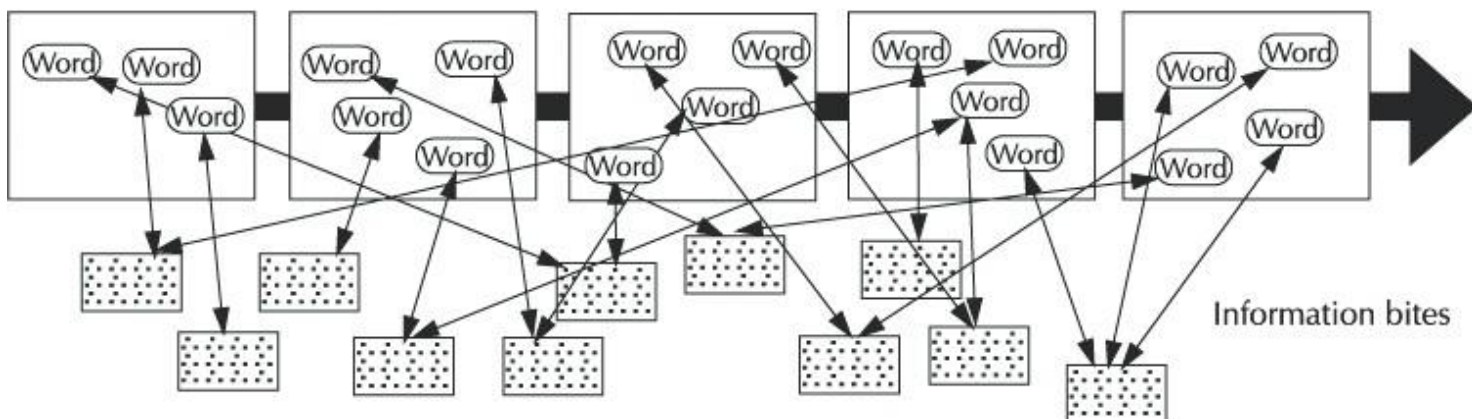
- ✓ Two buzzwords used often in hypertext systems are link and node.
- ✓ Links are connections between the conceptual elements, that is, the nodes, which may consist of text, graphics, sounds, or related information in the knowledge base. Links connect Caesar Augustus with Rome,

for example, and grapes with wine, and love with hate. The art of hypermedia design lies in the visualization of these nodes and their links so that they make sense, not nonsense, and can form the backbone of a knowledge access system. Along with the use of HTML for the World Wide Web, the term anchor is used for the reference from one document to another document, image, sound, or file on the Web.

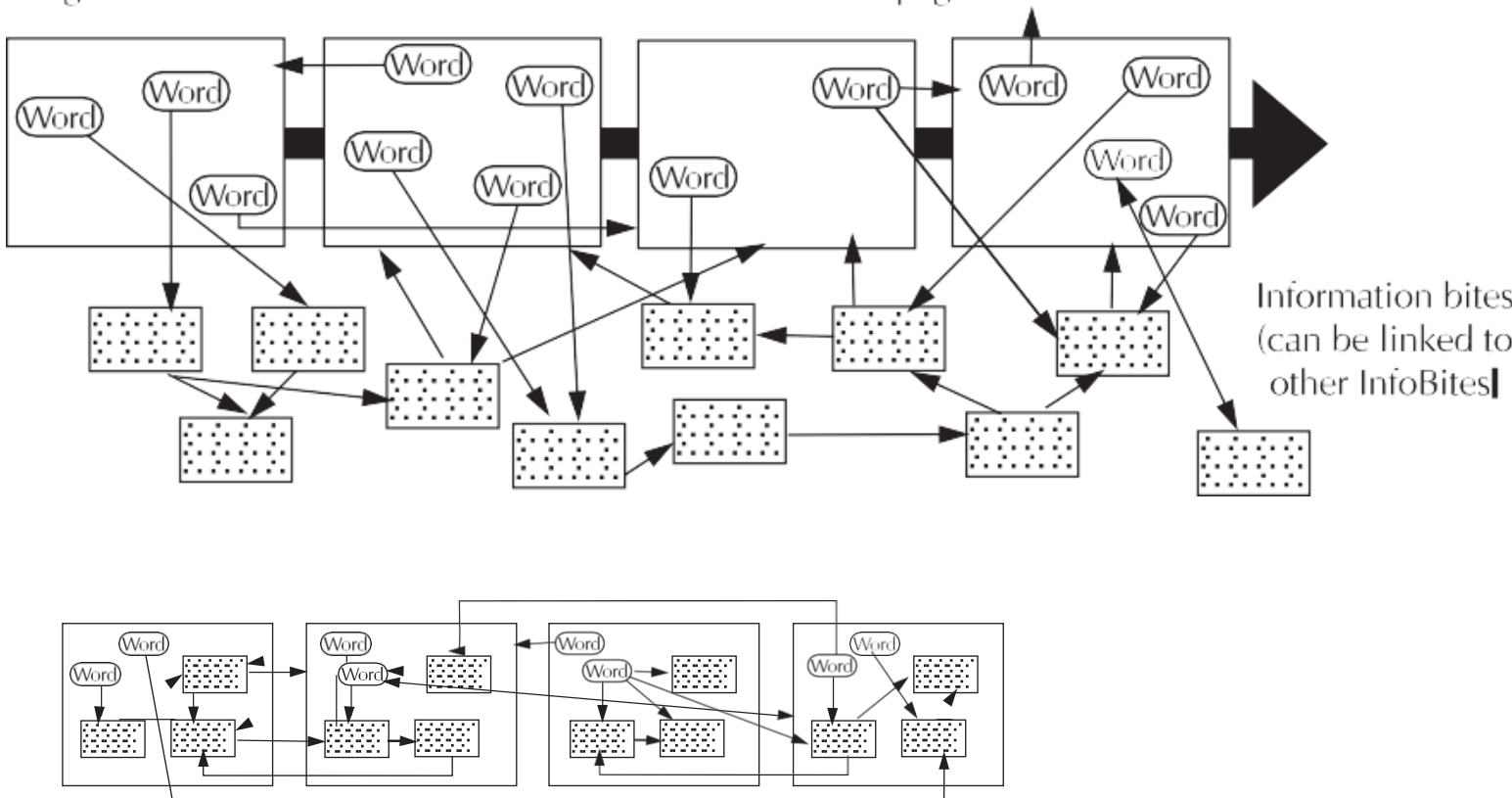
- ✓ Links are the navigation pathways and menus; nodes are accessible topics, documents, messages, and content elements
- ✓ A link anchor is where from; a link end is the destination node linked to the anchor.
- ✓ Some hypertext systems provide unidirectional navigation and offer no return pathway; others are bidirectional.

The simplest way to navigate hypermedia structures is via buttons that access linked information (text, graphics, and sounds) that is contained at the nodes.

Pages of text with hot words linked to InfoBites only



Pages of text with hot words linked to InfoBites linked to pages and to other InfoBites



Hypertext Tools

- ✓ Two functions are common to most hypermedia text management systems, and they are often provided as separate applications: building (or authoring) and reading.
- ✓ The builder creates the links, identifies nodes, and generates the all-important index of words.
- ✓ The index methodology and the search algorithms used to find and group words according to user search criteria are typically proprietary, and they represent an area where computers are carefully optimized for performance—finding search words among a list of many tens of thousands of words requires speed-demon programming.
- ✓ Hypertext systems are currently used for electronic publishing and reference works, technical documentation, educational courseware, inter- active kiosks, electronic catalogs, interactive fiction, and text and image databases.
- ✓ Today these tools are used extensively with information organized in a linear fashion; it still may be many years before the majority of multimedia project users become comfortable with fully nonlinear hyper- text and hypermedia systems.