

Syllabus

Information Technology Application in Mass Media

UNIT I

Different applications of computers for media – introduction – text, graphics, drawings, animation, sounds.

UNIT II

Multimedia applications – business applications, educational application, public utility, virtual reality; multimedia skills.

UNIT III

Page maker, Interfacing, working with text, page setup, printing, formatting techniques, graphics and drawings.

UNIT IV

Images, bitmaps, drawing, principles of animation, use of video – broadcast, video standards NTSC-PAL-SECAM-HDTV, integration of computers and televisions,

Tutorial – PAPER 1 - Information Technology Application in Mass Media

UNIT I

Different applications of computers for media – introduction – text, graphics, drawings, animation, sounds.

The **mass media** are diversified media technologies that are intended to reach a large audience by mass communication. The technologies through which this communication takes place varies. Broadcast media such as radio, recorded music, film and television transmit their information electronically. Print media use a physical object such as a newspaper, book, pamphlet or comics, to distribute their information. Outdoor media is a form of mass media that comprises billboards, signs or placards placed inside and outside of commercial buildings, sports stadiums, shops and buses. Other outdoor media include flying billboards (signs in tow of airplanes), blimps, and skywriting. Public speaking and event organising can also be considered as forms of mass media. The digital media comprises both Internet and mobile mass communication. Internet media provides many mass media services, such as email, websites, blogs, and internet based radio and television. Many other mass media outlets have a presence on the web, by such things as having TV ads that link to a website, or distributing a QR Code in print or outdoor media to direct a mobile user to a website. In this way, they can utilise the easy accessibility that the Internet has, and the outreach that Internet affords, as information can easily be broadcast to many different regions of the world simultaneously and cost-efficiently.

Issues with definition

In the 2000s, a classification called the "seven media" became popular. In order of introduction, they are:

1. Print (books, pamphlets, newspapers, magazines, etc.) from the late 15th century
2. Recordings (gramophone records, magnetic tapes, cassettes, cartridges, CDs, DVDs) from the late 19th century
3. Cinema from about 1900
4. Radio from about 1910
5. Television from about 1950
6. Internet from about 1990
7. Mobile phones from about 2000

Characteristics

Five characteristics of mass communication have been identified by Cambridge University's John Thompson

- "Comprises both technical and institutional methods of production and distribution" This is evident throughout the history of the media, from print to the Internet, each suitable for commercial utility.
- Involves the "commodification of symbolic forms", as the production of materials relies on its ability to manufacture and sell large quantities of the work. Just as radio stations rely on its time sold to advertisements, newspapers rely for the same reasons on its space.
- "Separate contexts between the production and reception of information"
- Its "reach to those 'far removed' in time and space, in comparison to the producers".
- "Information distribution" - a "one to many" form of communication, whereby products are mass-produced and disseminated to a great quantity of audiences.

Mass vs. mainstream

"Mass media" is sometimes used as a synonym for "mainstream media", which is distinguished from alternative media by the content and point of view. Alternative media are also "mass media" outlets in the sense of using technology capable of reaching many people, even if the audience is often smaller than the mainstream.

In common usage, the term "mass" denotes not that a given number of individuals receives the products, but rather that the products are available in principle to a plurality of recipients

Mass vs. local

Mass media is distinguished from local media by the notion that whilst the former aims to reach a very large market such as the entire population of a country, the latter broadcasts to a much smaller population and area, and generally focuses on regional news rather than global events. A third type of media, speciality media, provides for specific demographics, such as specialty channels on TV (sports channels, porn channels, etc.). These definitions are not set in stone, and it is possible for a media outlet to be promoted in status from a local media outlet to a global media outlet. Some local media, which take an interest in state or provincial news can rise to prominence due to their investigative journalism, and to the local region's preference of updates in national politics rather than regional news. The Guardian, formerly known as the Manchester Guardian is an example of one such media outlet. Once a regional daily newspaper, The Guardian is currently a nationally respected paper.

Forms of mass media

Broadcast

The sequencing of content in a broadcast is called a schedule. With all technological endeavours a number of technical terms and slang are developed please see the list of broadcasting terms for a glossary of terms used.

Television and radio programs are distributed through radio broadcasting over frequency bands that are highly regulated by the Federal Communications Commission. Such regulation includes determination of the width of the bands, range, licencing, types of receivers and transmitters used, and acceptable content.

Cable programs are often broadcast simultaneously with radio and television programs, but have a more limited audience. By coding signals and having a cable converter box in homes, cable also enables subscription-based channels and pay-per-view services.

A broadcasting organisation may broadcast several programs at the same time, through several channels (frequencies), for example BBC One and Two. On the other hand, two or more organisations may share a channel and each use it during a fixed part of the day. Digital radio and digital television may also transmit multiplexed programming, with several channels compressed into one ensemble.

When broadcasting is done via the Internet the term webcasting is often used. In 2004 a new phenomenon occurred when a number of technologies combined to produce podcasting. Podcasting is an asynchronous broadcast/narrowcast medium, with one of the main proponents being Adam Curry and his associates the Podshow.

Film

'Film' encompasses motion pictures as individual projects, as well as the field in general. The name comes from the photographic film (also called filmstock), historically the primary medium for recording and displaying motion pictures. Many other terms exist—*motion pictures* (or just *pictures* and "picture"), *the silver screen*, *photoplays*, *the cinema*, *picture shows*, *flicks*—and commonly *movies*.

Films are produced by recording people and objects with cameras, or by creating them using animation techniques and/or special effects. They comprise a series of individual frames, but when these images are shown rapidly in succession, the illusion of motion is given to the viewer. Flickering between frames is not seen due to an effect known as persistence of vision—whereby the eye retains a visual image for a fraction of a second after the source has been removed. Also of relevance is what causes the perception of motion; a psychological effect identified as beta movement.

Film is considered by many to be an important art form; films entertain, educate, enlighten and inspire audiences. Any film can become a worldwide attraction, especially with the addition of dubbing or subtitles that translate the film message. Films are also artifacts created by specific cultures, which reflect those cultures, and, in turn, affect them.

Video games

A video game is a computer-controlled game where a video display such as a monitor or television is the primary feedback device. The term "computer game" also includes games which display only text (and which can therefore theoretically be played on a teletypewriter) or which use other methods, such as sound or vibration, as their primary feedback device, but there are very few new games in these categories. There always must also be some sort of input device, usually in the form of button/joystick combinations (on arcade games), a keyboard & mouse/trackball combination (computer games), or a controller (console games), or a combination of any of the above. Also, more esoteric devices have been used for input. Usually there are rules and goals, but in more open-ended games the player may be free to do whatever they like within the confines of the virtual universe.

In common usage, a "computer game" or a "PC game" refers to a game that is played on a personal computer. "Console game" refers to one that is played on a device specifically designed for the use of such, while interfacing with a standard television set. "Arcade game" refers to a game designed to be played in an establishment in which patrons pay to play on a per-use basis. "Video game" (or "videogame") has evolved into a catchall phrase that encompasses the aforementioned along with any game made for any other device, including, but not limited to, mobile phones, PDAs, advanced calculators, etc.

Audio recording and reproduction

Sound recording and reproduction is the electrical or mechanical re-creation and/or amplification of sound, often as music. This involves the use of audio equipment such as microphones, recording devices and loudspeakers. From early beginnings with the invention of the phonograph using purely mechanical techniques, the field has advanced with the invention of electrical recording, the mass production of the 78 record, the magnetic wire recorder followed by the tape recorder, the vinyl LP record. The invention of the compact cassette in the 1960s, followed by Sony's Walkman, gave a major boost to the mass distribution of music recordings, and the invention of digital recording and the compact disc in 1983 brought massive improvements in ruggedness and quality. The most recent developments have been in digital audio players.

An album is a collection of related audio recordings, released together to the public, usually commercially.

The term record album originated from the fact that 78 RPM Phonograph disc records were kept together in a book resembling a photo album. The first collection of records to be called an "album" was Tchaikovsky's *Nutcracker Suite*, release in April 1909 as a four-disc set by Odeon records. It retailed for 16 shillings—about £15 in modern currency.

A music video (also promo) is a short film or video that accompanies a complete piece of music, most commonly a song. Modern music videos were primarily made and used as a marketing device intended to promote the sale of music recordings. Although the origins of music videos go back much further, they came into their own in the 1980s, when Music Television's format was based on them. In the 1980s, the term "rock video" was often used to describe this form of entertainment, although the term has fallen into disuse.

Music videos can accommodate all styles of filmmaking, including animation, live action films, documentaries, and non-narrative, abstract film.

Internet

The Internet (also known simply as "the Net" or less precisely as "the Web") is a more interactive medium of mass media, and can be briefly described as "a network of networks". Specifically, it is the worldwide, publicly accessible network of interconnected computer networks that transmit data by packet switching using the standard Internet Protocol (IP). It consists of millions of smaller domestic, academic, business, and governmental networks, which together carry various information and services, such as email, online chat, file transfer, and the interlinked web pages and other documents of the World Wide Web.

Contrary to some common usage, the Internet and the World Wide Web are not synonymous: the Internet is the system of interconnected *computer networks*, linked by copper wires, fiber-optic cables, wireless connections etc.; the Web is the contents, or the interconnected *documents*, linked by hyperlinks and URLs. The World Wide Web is accessible through the Internet, along with many other services including e-mail, file sharing and others described below.

Toward the end of the 20th century, the advent of the World Wide Web marked the first era in which most individuals could have a means of exposure on a scale comparable to that of mass media. Anyone with a web site has the potential to address a global audience, although serving to high levels of web traffic is still relatively expensive. It is possible that the rise of peer-to-peer technologies may have begun the process of making the cost of bandwidth manageable. Although a vast amount of information, imagery, and commentary (i.e. "content") has been made available, it is often difficult to determine the authenticity and reliability of information contained in web pages (in many cases, self-published). The invention of the Internet has also allowed breaking news stories to reach around the globe within minutes. This rapid growth of instantaneous, decentralized communication is often deemed likely to change mass media and its relationship to society.

"Cross-media" means the idea of distributing the same message through different media channels. A similar idea is expressed in the news industry as "convergence". Many authors understand cross-media publishing to be the ability to publish in both print and on the web without manual conversion effort. An increasing number of wireless devices with mutually incompatible data and screen formats make it even more difficult to achieve the objective "create once, publish many".

The Internet is quickly becoming the center of mass media. Everything is becoming accessible via the internet. Instead of picking up a newspaper, or watching the 10 o'clock news, people can log onto the internet to get the news they want, when they want it. For example, many workers listen to the radio through the Internet while sitting at their desk.

Even the education system relies on the Internet. Teachers can contact the entire class by sending one e-mail. They may have web pages where students can get another copy of the class outline or assignments. Some classes have class blogs in which students are required to post weekly, with students graded on their contributions.

Blogs (web logs)

Blogging, too, has become a pervasive form of media. A blog is a website, usually maintained by an individual, with regular entries of commentary, descriptions of events, or interactive media such as images or video. Entries are

commonly displayed in reverse chronological order, with most recent posts shown on top. Many blogs provide commentary or news on a particular subject; others function as more personal online diaries. A typical blog combines text, images and other graphics, and links to other blogs, web pages, and related media. The ability for readers to leave comments in an interactive format is an important part of many blogs. Most blogs are primarily textual, although some focus on art (artlog), photographs (photoblog), sketchblog, videos (vlog), music (MP3 blog), audio (podcasting) are part of a wider network of social media. Microblogging is another type of blogging which consists of blogs with very short posts.

RSS feeds

RSS is a format for syndicating news and the content of news-like sites, including major news sites like Wired, news-oriented community sites like Slashdot, and personal blogs. It is a family of Web feed formats used to publish frequently updated content such as blog entries, news headlines, and podcasts. An RSS document (which is called a "feed" or "web feed" or "channel") contains either a summary of content from an associated web site or the full text. RSS makes it possible for people to keep up with web sites in an automated manner that can be piped into special programs or filtered displays.

Podcast

A podcast is a series of digital-media files which are distributed over the Internet using syndication feeds for playback on portable media players and computers. The term podcast, like broadcast, can refer either to the series of content itself or to the method by which it is syndicated; the latter is also called podcasting. The host or author of a podcast is often called a podcaster.

Mobile

Mobile phones were introduced in Japan in 1979 but became a mass media only in 1998 when the first downloadable ringing tones were introduced in Finland. Soon most forms of media content were introduced on mobile phones, tablets and other portable devices, and today the total value of media consumed on mobile vastly exceeds that of internet content, and was worth over 31 billion dollars in 2007 (source Informa). The mobile media content includes over 8 billion dollars worth of mobile music (ringing tones, ringback tones, truetones, MP3 files, karaoke, music videos, music streaming services etc.); over 5 billion dollars worth of mobile gaming; and various news, entertainment and advertising services. In Japan mobile phone books are so popular that five of the ten best-selling printed books were originally released as mobile phone books.

Similar to the internet, mobile is also an interactive media, but has far wider reach, with 3.3 billion mobile phone users at the end of 2007 to 1.3 billion internet

users (source ITU). Like email on the internet, the top application on mobile is also a personal messaging service, but SMS text messaging is used by over 2.4 billion people. Practically all internet services and applications exist or have similar cousins on mobile, from search to multiplayer games to virtual worlds to blogs. Mobile has several unique benefits which many mobile media pundits claim make mobile a more powerful media than either TV or the internet, starting with mobile being permanently carried and always connected. Mobile has the best audience accuracy and is the only mass media with a built-in payment channel available to every user without any credit cards or PayPal accounts or even an age limit. Mobile is often called the 7th Mass Medium and either the fourth screen (if counting cinema, TV and PC screens) or the third screen (counting only TV and PC).

Print media

Book

A book is a collection of sheets of paper, parchment or other material with a piece of text written on them, bound together along one edge within covers. A book is also a literary work or a main division of such a work. A book produced in electronic format is known as an e-book.

Magazine

A magazine is a periodical publication containing a variety of articles, generally financed by advertising and/or purchase by readers.

Magazines are typically published weekly, biweekly, monthly, bimonthly or quarterly, with a date on the cover that is in advance of the date it is actually published. They are often printed in color on coated paper, and are bound with a soft cover.

Magazines fall into two broad categories: consumer magazines and business magazines. In practice, magazines are a subset of periodicals, distinct from those periodicals produced by scientific, artistic, academic or special interest publishers which are subscription-only, more expensive, narrowly limited in circulation, and often have little or no advertising.

Magazines can be classified as:

- General interest magazines (e.g. *Frontline*, *India Today*, *The Week*, *The Sunday Times* etc.)
- Special interest magazines (women's, sports, business, scuba diving, etc.)

Newspaper

A newspaper is a publication containing news and information and advertising, usually printed on low-cost paper called newsprint. It may be general or special interest, most often published daily or weekly. The first printed newspaper was published in 1605, and the form has thrived even in the face of competition from technologies such as radio and television. Recent developments on the Internet are posing major threats to its business model, however. Paid circulation is declining in most countries, and advertising revenue, which makes up the bulk of a newspaper's income, is shifting from print to online; some commentators, nevertheless, point out that historically new media such as radio and television did not entirely supplant existing.

Outdoor media

Outdoor media is a form of mass media which comprises billboards, signs, placards placed inside and outside of commercial buildings/objects like shops/buses, flying billboards (signs in tow of airplanes), blimps, and skywriting. Many commercial advertisers use this form of mass media when advertising in sports stadiums. Tobacco and alcohol manufacturers used billboards and other outdoor media extensively. However, in 1998, the Master Settlement Agreement between the US and the tobacco industries prohibited the billboard advertising of cigarettes. In a 1994 Chicago-based study, Diana Hackbarth and her colleagues revealed how tobacco- and alcohol-based billboards were concentrated in poor neighbourhoods. In other urban centers, alcohol and tobacco billboards were much more concentrated in African-American neighborhoods than in white neighborhoods.

Purposes



A panel in the Newseum in Washington, D.C., shows the September 12 headlines in America and around the world

Mass media encompasses much more than just news, although it is sometimes misunderstood in this way. It can be used for various purposes:

- Advocacy, both for business and social concerns. This can include advertising, marketing, propaganda, public relations, and political communication.
- Entertainment, traditionally through performances of acting, music, sports, and TV shows along with light reading; since the late 20th century also through video and computer games.

- Public service announcements and emergency alerts (that can be used as political device to communicate propaganda to the public).

Effects of Computers on the Mass Media

Removal of Gatekeepers

- The biggest change computers have made with mass media is the fact that there is no gateway between the writer and publishing. Anyone can set up a personal blog and report whatever news they wish. News can get to people more quickly, but it typically doesn't go through the fact-checking or editing process like you'd see at a newspaper. Video blogs are another way news is delivered by anyone as well. People can record videos and post them online on popular mediums such as YouTube.

Speed and Style

- By the time a story is published in a newspaper it is likely that people already know what is happening. Even before it appears on the nightly news people have used computers to spread the word via social networking sites like Twitter or their personal blogs. News stations and newspapers even have places on their websites where their audience can submit news as it is happening. Writing style has changed as well. Journalism students are taught how to write for the online readers versus print. For example, frequently stories are updated throughout the day as news breaks, requiring a different mindset for a different audience.

-

Rise of Multimedia

- Computers allow journalists to add additional content to stories as well. Audio and video clips can be added to web stories, engaging the readers more than a newspaper or televised newscast can. Podcasts are a popular way news is delivered because the news can be downloaded on to an iPod and taken on the go. Another big change is the death of print media. Print products have generally been losing advertising revenue as more readers flock to the Web. Newspaper subscriptions have fallen dramatically.

UNIT II

Multimedia applications – business applications, educational application, public utility, virtual reality; multimedia skills.

Virtual reality (VR), sometimes referred to as **immersive multimedia**, is a computer-simulated environment that can simulate physical presence in places in the real world or imagined worlds. Virtual reality can recreate sensory experiences, including virtual taste, sight, smell, sound, touch, etc.

Most current virtual reality environments are primarily visual experiences, displayed either on a computer screen or through special stereoscopic displays, but some simulations include additional sensory information, such as sound through speakers or headphones. Some advanced, haptic systems now include tactile information, generally known as force feedback in medical, gaming and military applications. Furthermore, virtual reality covers remote communication environments which provide virtual presence of users with the concepts of telepresence and telexistence or a virtual artifact (VA) either through the use of standard input devices such as a keyboard and mouse, or through multimodal devices such as a wired glove, the Polhemus, and omnidirectional treadmills. The simulated environment can be similar to the real world in order to create a lifelike experience—for example, in simulations for pilot or combat training—or it can differ significantly from reality, such as in VR games. In practice, it is currently very difficult to create a high-fidelity virtual reality experience, because of technical limitations on processing power, image resolution, and communication bandwidth. However, the technology's proponents hope that such limitations will be overcome as processor, imaging, and data communication technologies become more powerful and cost-effective over time.

Virtual reality is often used to describe a wide variety of applications commonly associated with immersive, highly visual, 3D environments. The development of CAD software, graphics hardware acceleration, head-mounted displays, datagloves, and miniaturization have helped popularize the notion. In the book *The Metaphysics of Virtual Reality* by Michael R. Heim, seven different concepts of virtual reality are identified: simulation, interaction, artificiality, immersion, telepresence, full-body immersion, and network communication. People often identify VR with head mounted displays and data suits

Skills students should have coming out of j-school:

1. Tweeting/live blogging
2. Deadline writing, multiple webhits
3. Blogging on WordPress
4. Shooting/editing photos, video
5. Audio editing
6. Storytelling through Storify

Skills that would put them at the top of the heap:

1. Mapping data with simple Google Fusion tables
2. Database journalism with Caspio, Google

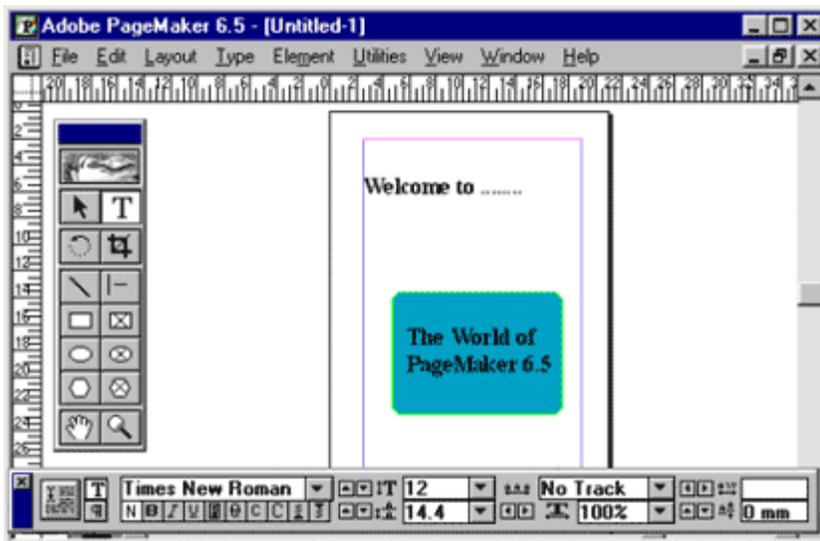
3. Interactive storytelling through sliderocket, thinglink, etc.
4. Infographics, like those created at easel.ly, visual.ly

UNIT III

Page maker, Interfacing, working with text, page setup, printing, formatting techniques, graphics and drawings.

Introduction

Adobe PageMaker 6.5 is the "world's leading cross-platform professional page layout software". PageMaker is primarily used for designing and producing publications such as flyers and newsletters and any other application that requires a combination of text and graphics. PageMaker 6.5 has a rich array of facilities to import text and artwork from other computer application packages, as well as allowing you to generate these directly from within PageMaker itself. PageMaker can handle text better than Illustrator and PhotoShop and also gives you the flexibility of graphic control not available in word processors.



New Features in PageMaker 6.5

Document Layers

Layers allow you to place elements one over the other. It can be thought of as sheets stacked up one on top of the other. You can place elements on these layers or temporarily hide the layers. These layers can be used for adding annotations, floating or background images.

Easier Layout

There is a new concept of frames in PageMaker 6.5, which can hold any type of text or images. PageMaker's freeform layout capabilities have become even more flexible with its frame and text controls.

Better Integration

PageMaker can work seamlessly with PhotoShop, Illustrator etc. It also builds the ability to drag and drop images and elements directly from one of these applications to the other.

Color Controls

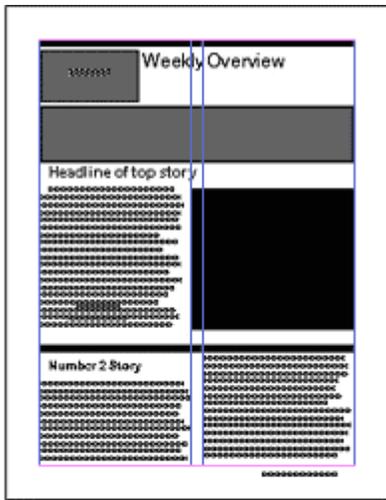
PageMaker 6.5 introduces new color technologies, which helps in reproducing high fidelity colors in your publications. A new desktop color separation tool is also included. The Kodak color management system now supports the International Consortium of Standard for sharing device profiles.

Internet Ready

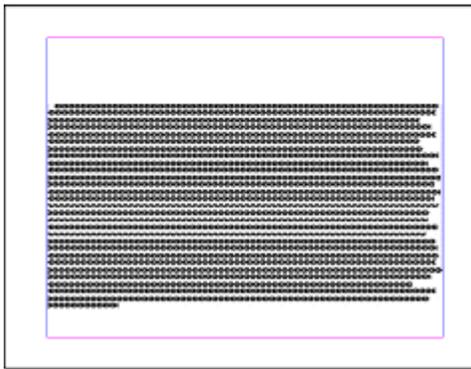
The current release of PageMaker (i.e. Version 6.5) includes an option to export your PageMaker documents to Internet ready HTML (Hyper Text Markup Language) files with the links preserved. The document images are converted to GIF or JPEG format required by the Internet. There is also an option to export the PageMaker documents in to Adobe Acrobat format.

Paper Orientation

You can set paper in two ways, portrait is one in which the paper is used with the longer size in the vertical direction. If we interchange the directions, we get the Landscape Orientation.



Portrait



Landscape

Starting PageMaker

- Click the **Start** button.
- Select **Programs**.
- From the **Programs Menu** select **Adobe**.
- In the **Adobe Menu** select **PageMaker 6.5**.
- Click **Adobe PageMaker 6.5**.
- The **PageMaker** window is displayed.

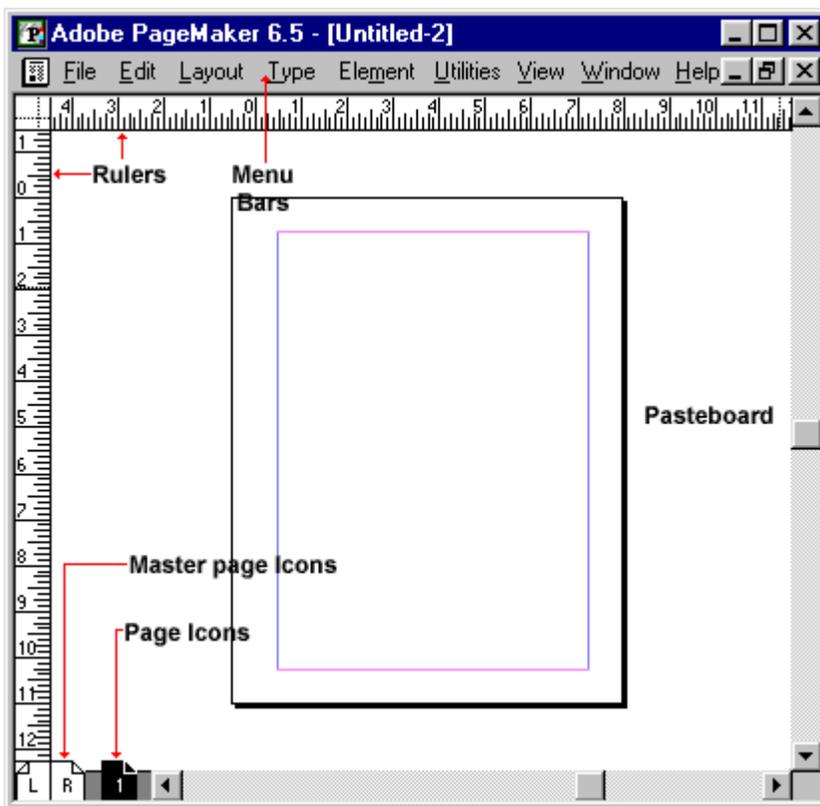
PageMaker Environment

Menu Bar	The standard menu bar contains all the main menus for File, Layout, Element and other utilities.
Ruler	The top and left ruler bars helps you to precisely position the cursor, text, and graphics in the page. The Current Cursor location is shown by two dotted lines in the rulers. To view the rulers select View > Show Rulers.
Master Page Icon	The Master Page icon shows the position of the master Pages. Clicking it will display the Master Page. Master Pages contain text, graphics, layout and settings, which are common,

thought the publication.

Page Icon The Page icon shows the list of pages in the publication with the currently selected page in black. Clicking a particular page icon will display the selected page.

Pasteboard Surrounding the page is an area of white space called the Pasteboard. It is used to store graphics and texts as you work. Items you place on the pasteboard are visible from any page and can be selected and moved regardless of the page you are currently working on.



File Menu

New New command is used to create a new publication. This command gives rise to a dialog box where you define the various options before opening a new page of the publication.

Open Open allow you to open an existing PageMaker file.

Save Save command saves the current publication. To save all the open files, press the shift key while choosing the Save option.

Revert Revert command rolls back all the changes made since the last save. It is the same as closing the publishing, without saving and opening it again.

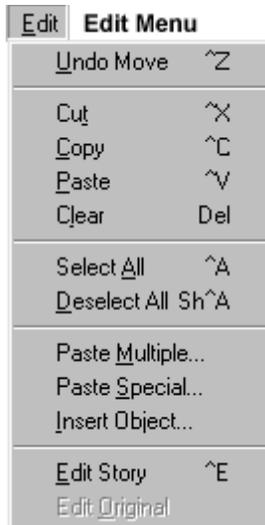
Place Place command is used to place text and graphics into the

	publication.
Acquire	The Acquire command is used to scan an image into your publication.
Export	Export command lets you export your publications into the format you select.



Edit Menu

Paste Multiple	Paste Multiple lets you paste multiple copies of text or graphics.
Paste Special	Paste Special is used to specify the format to use when you paste an object into your publication.
Insert Object	Insert Object is used to specify the format to be used to insert an OLE embedded object within a PageMaker publication.
Edit Story	Edit Story is used to toggle between the word processing mode and the layout mode.

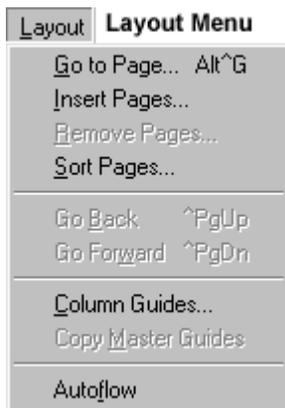


Layout Menu

Sort Pages When you select Sort Pages command, a dialog box appears with all the pages of the publication. You can rearrange the pages in the publication graphically.

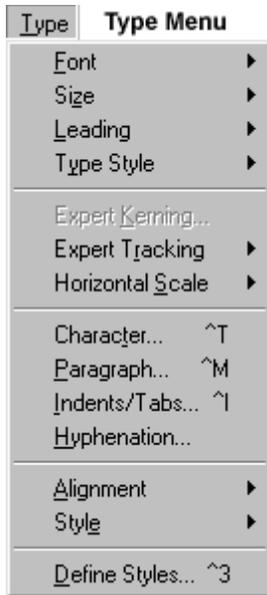
Column Guides Column Guides lets you divide the pages of the publication into different columns of equal size.

Auto Flow Auto flow is used to flow the text onto the pages of the publications on its own from a loaded text icon. It flows the text into pages from columns to columns and also adds pages on its own depending on the availability of text.



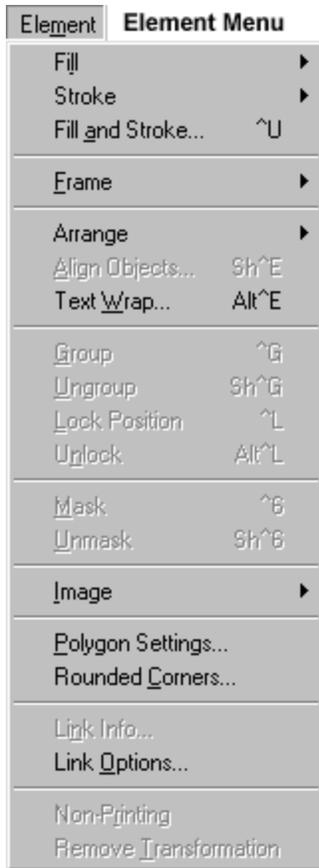
Type Menu

Define Styles This option will present you a dialog box with the list of styles used in the publication. You can add, modify and delete styles from this dialog box.



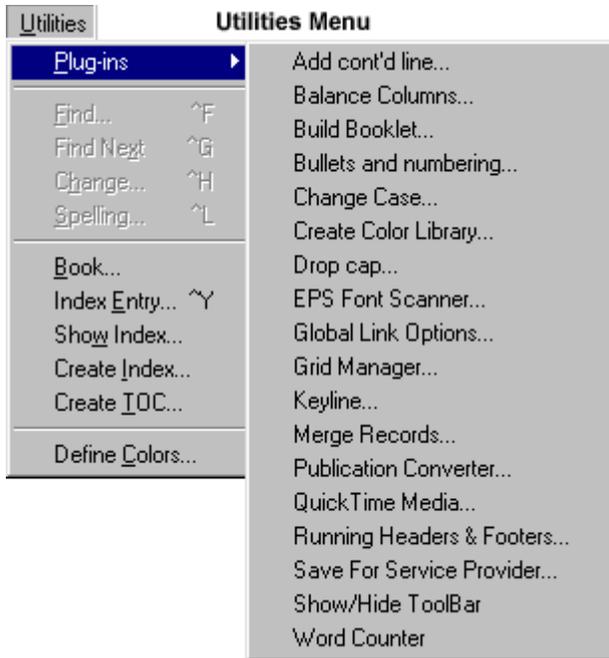
Element Menu

Frame	Frame has options for frame alignment, position and margins.
Align Objects	Align Objects lets you align multiple objects relative to each other.
Link Options	Link Options is used to define whether the linked text or graphic is to be updated along with the publication in use and also its frequency.



Utilities Menu

Plug-ins Plug-ins has a list of sub commands, which lists out the various plug-ins, which have been included with PageMaker as additions.



View Menu

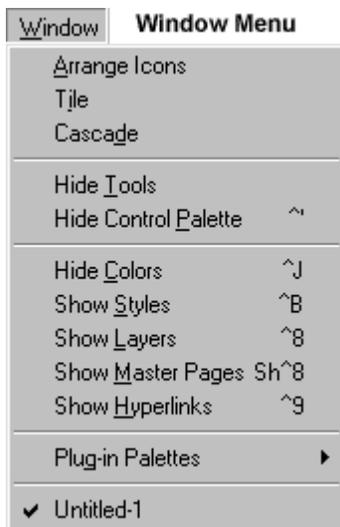
Display Master Items Display Master Items toggle the display of items from the master pages to be reflected in the current page of the publication.

Display Non-Printing Items Display Non-Printing items toggle the display of non-printing items.



Window Menu

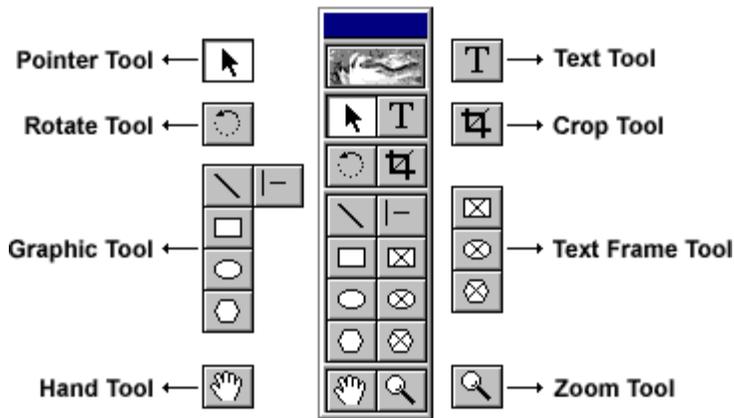
Show Tools	Hide/Show tools toggles the display of PageMaker toolbar.
Show Control Palette	Show/Hide Control Panel toggles the display of control panel on the screen.
Show Colors	Show/Hide Colors Toggles the display of the Color Palette on the screen.
Show Styles	Show/Hide Styles toggles the display of the Styles Palette on the screen.
Show Layers	Show/Hide Layers toggles the display of the Layers Palette on the screen.
Show Master Pages	Show/Hide Master Pages toggles the display of the Master Pages Palette on the screen.
Show Hyperlinks	Show/Hide Hyperlinks toggles the display of the Hyperlink Palette on the screen.



Understanding Pagemaker Tools

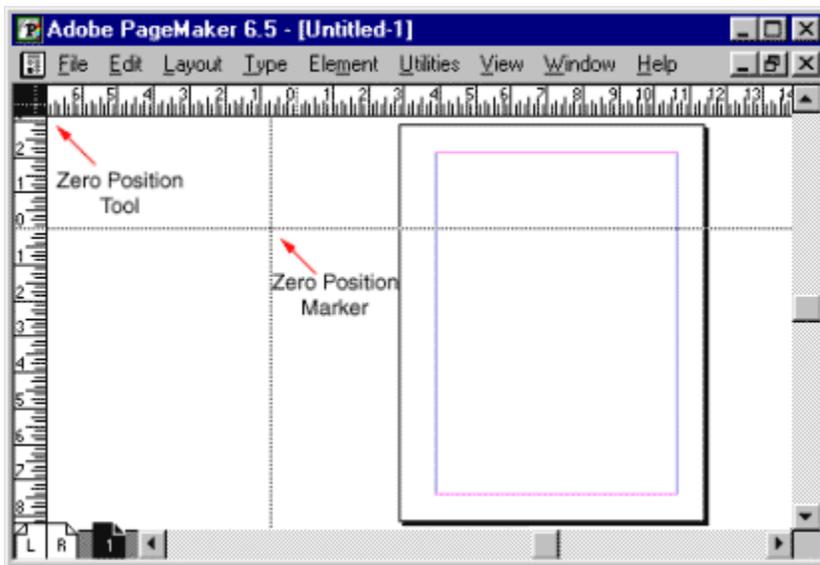
Toolbox

Toolbox contains all the tools used to create a publication in PageMaker. Choose Window and select Show Tools to display the toolbox. The individual tools will be explained in detail later in this session.



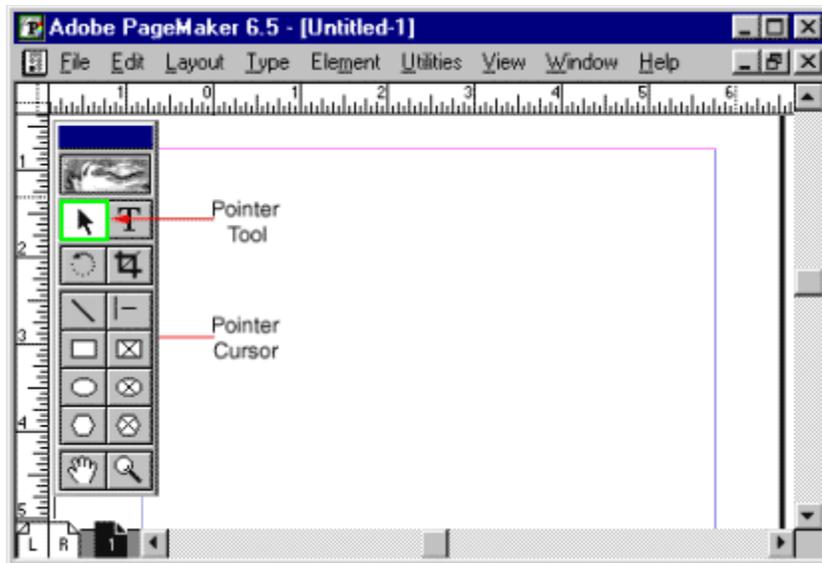
Zero Position

Zero Position allows you to set the zero position on the screen. Zero position is the position, where both the top and the left side rulers are at zero. By Zero positioning all measurements in the pages are made relative to this point. Click it and drag it to anywhere on the workspace to set it as the Zero Point



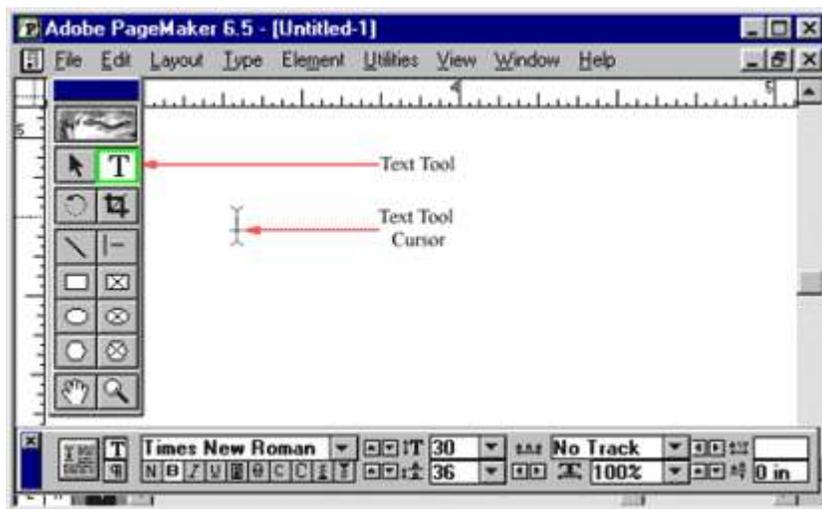
Pointer Tool

Pointer tool is used to pick, drag and drop graphics and text.



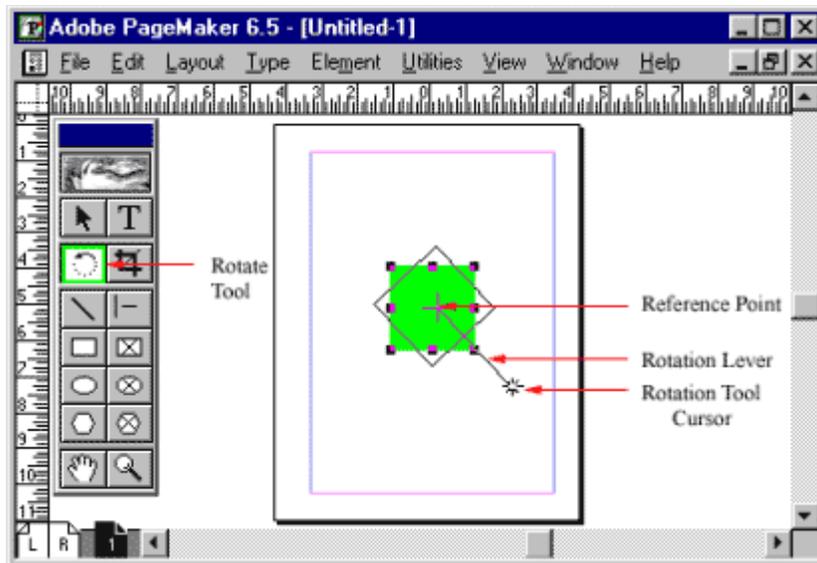
Text Tool

Text Tool is used to edit and select text and insert text frames. Click the text tool and click anywhere in the document and start entering text. The text tool creates a free flowing text box



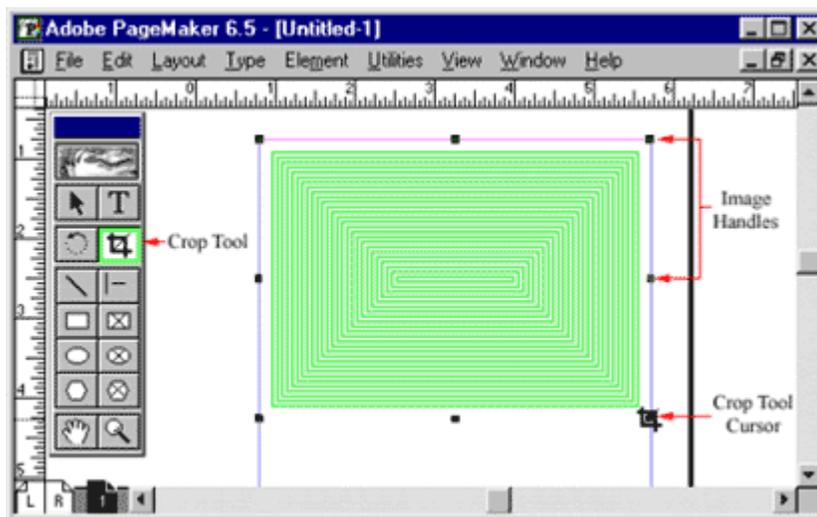
Rotate Tool

Rotate tool is used to rotate text and graphic objects. Click the rotate tool, then click on the object reference point and drag to rotate the object.



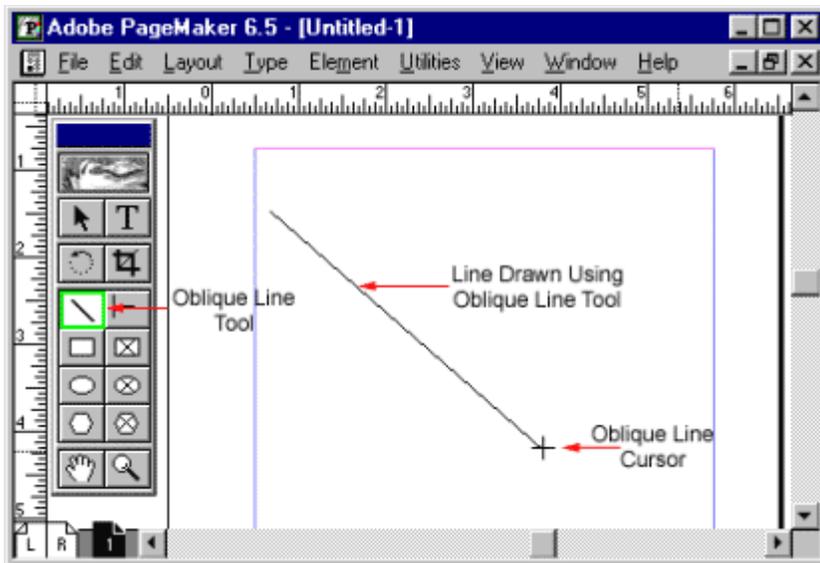
Crop Tool

The Crop tool is used to crop imported graphic images to the required size. The crop tool only works on TIFF type of images. Click on the toll and, drag the image handles, to crop the image.



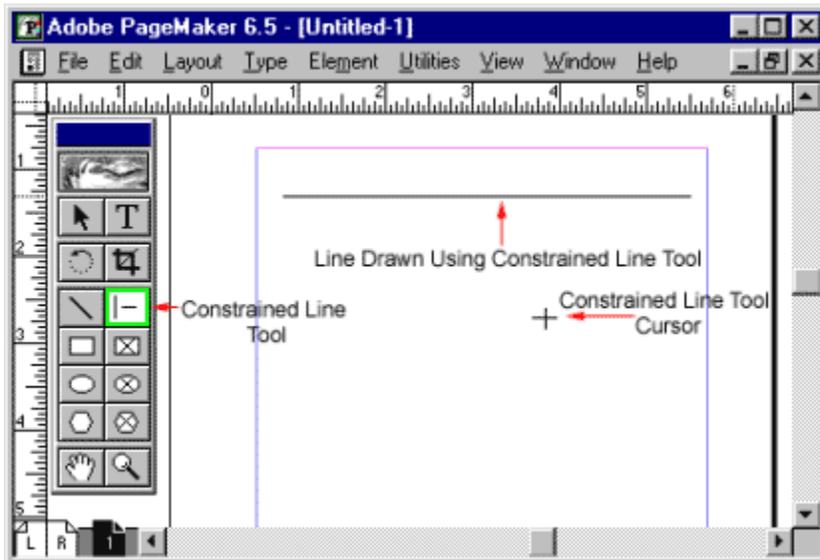
Oblique Line Tool

Oblique Line is used to draw slanting lines. To draw a line, click the oblique line tool, click and drag to draw a line in any direction.



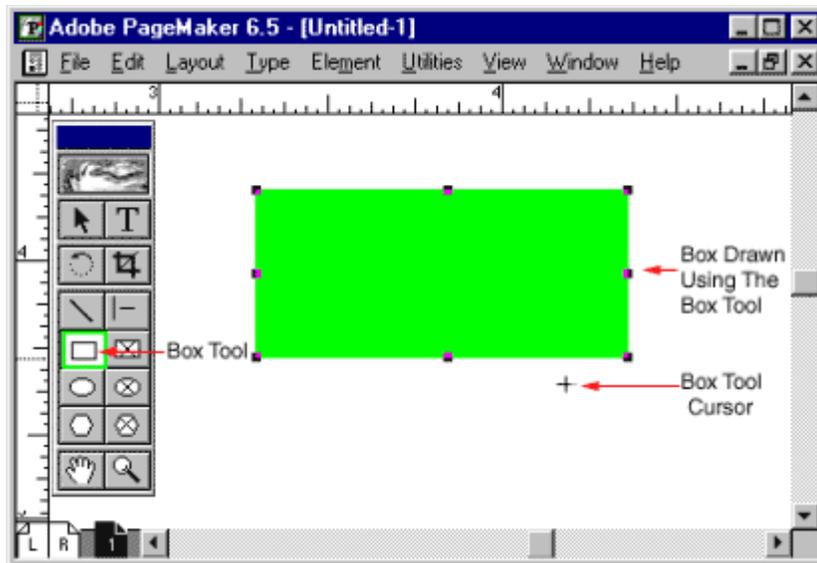
Constrained Line Tool

Constrained Line tool will draw lines at 45degree intervals, i.e., horizontally, vertically or diagonally.



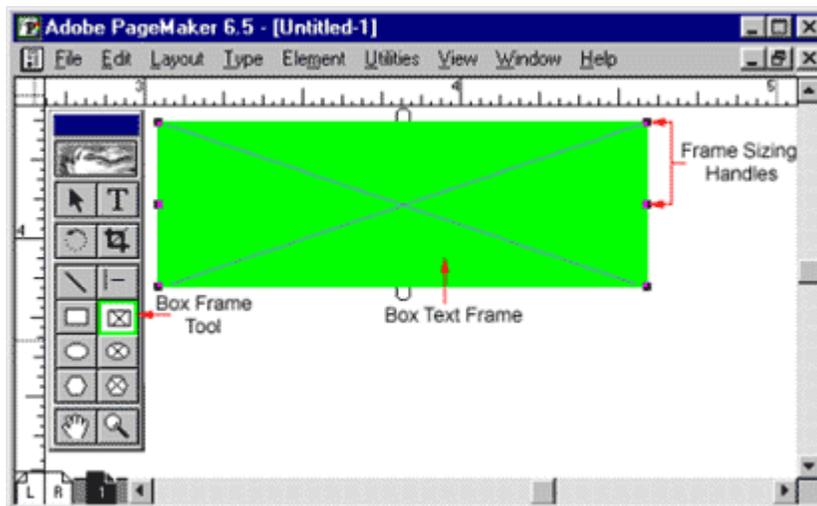
Box Tool

Box tool is used to draw a box



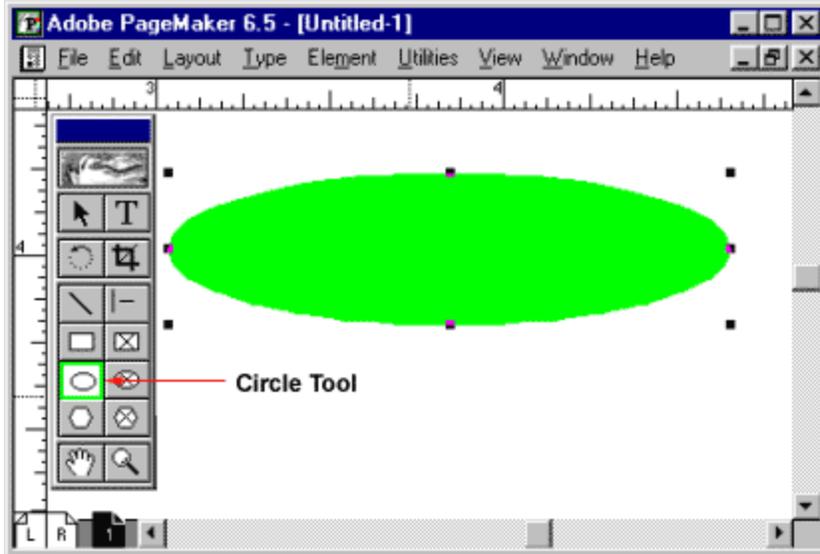
Rectangle Frame

Rectangle Frame is used to type text inside a box. First select the toll and draw the area to be enclosed by the rectangular frame, then select the text tool and click inside the drawn frame to enter text. The text will be constrained to the rectangular frame.



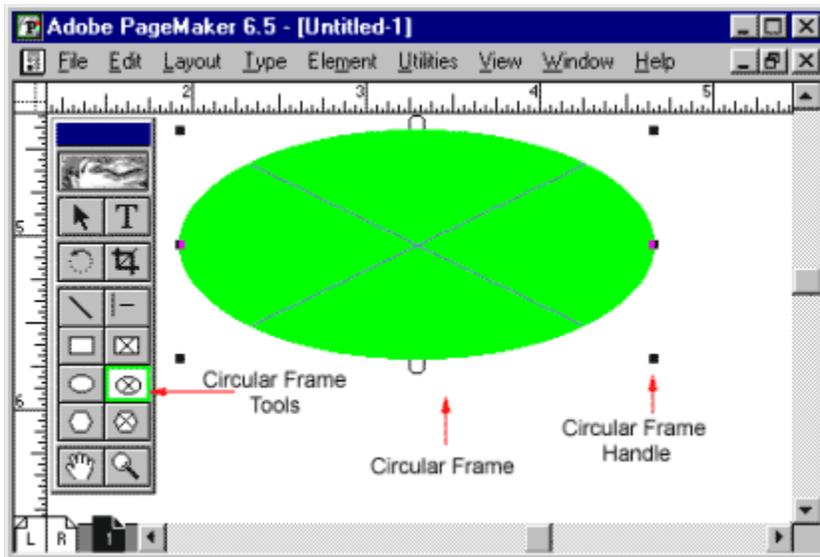
Circle Tool

Circle tool is used to draw a circle or elliptical graphic. To draw a circle or an ellipse, select the tool, click and drag to draw a circle on the document.



Circular Frame

Circular Frame is used to type text inside a circle or an oval. Use the Circular frame tool to draw the frame and then click inside with the text tool to start entering text. The entered text will be constrained to the circular frame.



UNIT IV

Images, bitmaps, drawing, principles of animation, use of video – broadcast, videostandards NTSC-PAL-SECAM-HDTV, integration of computers and televisions,

Images

An image (from Latin: imago) is an artifact that depicts visual perception, for example, a photo or a two-dimensional picture, that has a similar appearance to some subject—usually a physical object or a person, thus providing a depiction of it.

Images may be two-dimensional, such as a photograph or screen display, or three-dimensional, such as a statue or hologram. They may be captured by optical devices – such as cameras, mirrors, lenses, telescopes, microscopes, etc. and natural objects and phenomena, such as the human eye or water.

The word 'image' is also used in the broader sense of any two-dimensional figure such as a map, a graph, a pie chart, or a painting. In this wider sense, images can also be rendered manually, such as by drawing, the art of painting, carving, rendered automatically by printing or computer graphics technology, or developed by a combination of methods, especially in a pseudo-photograph.

A volatile image is one that exists only for a short period of time. This may be a reflection of an object by a mirror, a projection of a camera obscura, or a scene displayed on a cathode ray tube. A fixed image, also called a hard copy, is one that has been recorded on a material object, such as paper or textile by photography or any other digital process.

A mental image exists in an individual's mind, as something one remembers or imagines. The subject of an image need not be real; it may be an abstract concept, such as a graph, function, or "imaginary" entity. For example, Sigmund Freud claimed to have dreamed purely in aural-images of dialogs

The development of synthetic acoustic technologies and the creation of sound art have led to a consideration of the possibilities of a sound-image made up of irreducible phonic substance beyond linguistic or musicological analysis.

Bitmap

In computing, a bitmap is a mapping from some domain (for example, a range of integers) to bits (values which are zeros and ones). It is also called a bit array or bitmap index.

Bitmap image downsampled from an Inkscape vectorial image

In computer graphics, when the domain is a rectangle (indexed by two coordinates) a bitmap gives a way to store a binary image, that is, an image in which each pixel is either black or white (or any two colors).

The more general term pixmap refers to a map of pixels, where each one may store more than two colors, thus using more than one bit per pixel. Often bitmap is used for this as well. In some contexts, the term bitmap implies one bit per pixel, while pixmap is used for images with multiple bits per pixel.

A bitmap is a type of memory organization or image file format used to store digital images. The term bitmap comes from the computer programming terminology, meaning just a map of bits, a spatially mapped array of bits. Now, along with pixmap, it commonly refers to the similar concept of a spatially mapped array of pixels. Raster images in general may be referred to as bitmaps or pixmaps, whether synthetic or photographic, in files or memory.

Many graphical user interfaces use bitmaps in their built-in graphics subsystems; for example, the Microsoft Windows and OS/2 platforms' GDI subsystem, where the specific format used is the Windows and OS/2 bitmap file format, usually named with the file extension of .BMP (or .DIB for device-independent bitmap). Besides BMP, other file formats that store literal bitmaps include InterLeaved Bitmap (ILBM), Portable Bitmap (PBM), X Bitmap (XBM), and Wireless Application Protocol Bitmap (WBMP). Similarly, most other image file formats, such as JPEG, TIFF, PNG, and GIF, also store bitmap images (as opposed to vector graphics), but they are not usually referred to as bitmaps, since they use compressed formats internally.

Principles of animation

Disney's Twelve Basic Principles of Animation were introduced by the Disney animators Ollie Johnston and Frank Thomas in their 1981 book *The Illusion of Life: Disney Animation*. Johnston and Thomas in turn based their book on the work of the leading Disney animators from the 1930s onwards, and their effort to produce more realistic animations. The main purpose of the principles was to produce an illusion of characters adhering to the basic laws of physics, but they also dealt with more abstract issues, such as emotional timing and character appeal.

The book and some of its principles have been adopted by some traditional studios, and have been referred to by some as the "Bible of animation." In 1999 this book was voted number one of the "best animation books of all time" in an online poll. Though originally intended to apply to traditional, hand-drawn animation, the principles still have great relevance for today's more prevalent computer animation.

The 12 Principles of Animation

1. Squash and Stretch

The most important principle is "squash and stretch", the purpose of which is to give a sense of weight and flexibility to drawn objects. It can be applied to simple objects, like a bouncing ball, or more complex constructions, like the musculature of a human face. Taken to an extreme point, a figure stretched or squashed to an exaggerated degree can have a comical effect. In realistic animation, however, the most important aspect of this principle is the fact that an object's volume does

not change when squashed or stretched. If the length of a ball is stretched vertically, its width (in three dimensions, also its depth) needs to contract correspondingly horizontally.

2. Anticipation

Anticipation is used to prepare the audience for an action, and to make the action appear more realistic. A dancer jumping off the floor has to bend the knees first; a golfer making a swing has to swing the club back first. The technique can also be used for less physical actions, such as a character looking off-screen to anticipate someone's arrival, or attention focusing on an object that a character is about to pick up.

3. Staging

This principle is akin to staging in theatre, as it is known in theatre and film. Its purpose is to direct the audience's attention, and make it clear what is of greatest importance in a scene; Johnston and Thomas defined it as "the presentation of any idea so that it is completely and unmistakably clear", whether that idea is an action, a personality, an expression, or a mood. This can be done by various means, such as the placement of a character in the frame, the use of light and shadow, or the angle and position of the camera. The essence of this principle is keeping focus on what is relevant, and avoiding unnecessary detail.

4. Straight Ahead Action and Pose to Pose

These are two different approaches to the actual drawing process. "Straight ahead action" scenes are animated frame by frame from beginning to end, while "pose to pose" involves starting with drawing a few key frames, and then filling in the intervals later. "Straight ahead action" creates a more fluid, dynamic illusion of movement, and is better for producing realistic action sequences. On the other hand, it is hard to maintain proportions, and to create exact, convincing poses along the way. "Pose to pose" works better for dramatic or emotional scenes, where composition and relation to the surroundings are of greater importance. A combination of the two techniques is often used.

Computer animation removes the problems of proportion related to "straight ahead action" drawing; however, "pose to pose" is still used for computer animation, because of the advantages it brings in composition. The use of computers facilitates this method, and can fill in the missing sequences in between poses automatically. It is, however, still important to oversee this process and apply the other principles discussed.

5. Follow Through and Overlapping Action

Follow through and overlapping action is a general heading for two closely related techniques which help to render movement more realistically, and help to give the impression that characters follow the laws of physics, including the principle of inertia. "Follow through" means that loosely tied parts of a body should continue moving after the character has stopped and the parts should keep moving beyond the point where the character stopped only to be subsequently "pulled back" towards the center of mass and/or exhibiting various degrees of oscillation damping. "Overlapping action" is the tendency for parts of the body to move at different rates (an arm will move on different timing of the head and so on). A third, related technique is "drag", where a character starts to move and parts of him take a few frames to catch up. These parts can be inanimate objects like clothing or the antenna on a car, or parts of the body, such as arms or hair. On the human body, the torso is the core, with arms, legs, head and hair appendices that normally follow the torso's movement. Body parts with much tissue, such as large stomachs and breasts, or the loose skin on a dog, are more prone to independent movement than bonier body parts. Again, exaggerated use of the technique can produce a comical effect, while more realistic animation must time the actions exactly, to produce a convincing result.

6. Slow In and Slow Out

The movement of the human body, and most other objects, needs time to accelerate and slow down. For this reason, animation looks more realistic if it has more drawings near the beginning and end of an action, emphasizing the extreme poses, and fewer in the middle. This principle goes for characters moving between two extreme poses, such as sitting down and standing up, but also for inanimate, moving objects, like the bouncing ball in the above illustration.

7. Arc

Most natural action tends to follow an arched trajectory, and animation should adhere to this principle by following implied "arcs" for greater realism. This technique can be applied to a moving limb by rotating a joint, or a thrown object moving along a parabolic trajectory. The exception is mechanical movement, which typically moves in straight lines.

As an object's speed or momentum increases, arcs tend to flatten out in moving ahead and broaden in turns. In baseball, a fastball would tend to move in a straighter line than other pitches; while a figure skater moving at top speed would be unable to turn as sharply as a slower skater, and would need to cover more ground to complete the turn.

An object in motion that moves out of its natural arc for no apparent reason will appear erratic rather than fluid. For example, when animating a pointing finger, the animator should be certain that in all drawings in between the two extreme poses, the fingertip follows a logical arc from one extreme to the next. Traditional

animators tend to draw the arc in lightly on the paper for reference, to be erased later.

8. Secondary Action

Secondary Action: as the horse runs, its mane and tail follow the movement of the body.

Adding secondary actions to the main action gives a scene more life, and can help to support the main action. A person walking can simultaneously swing their arms or keep them in their pockets, speak or whistle, or express emotions through facial expressions. The important thing about secondary actions is that they emphasize, rather than take attention away from the main action. If the latter is the case, those actions are better left out. For example, during a dramatic movement, facial expressions will often go unnoticed. In these cases it is better to include them at the beginning and the end of the movement, rather than during.

9. Timing

Timing refers to the number of drawings or frames for a given action, which translates to the speed of the action on film. On a purely physical level, correct timing makes objects appear to obey the laws of physics; for instance, an object's weight determines how it reacts to an impetus, like a push. Timing is critical for establishing a character's mood, emotion, and reaction. It can also be a device to communicate aspects of a character's personality.

10 Exaggeration

Exaggeration is an effect especially useful for animation, as animated motions that strive for a perfect imitation of reality can look static and dull. The level of exaggeration depends on whether one seeks realism or a particular style, like a caricature or the style of a specific artist. The classical definition of exaggeration, employed by Disney, was to remain true to reality, just presenting it in a wilder, more extreme form. Other forms of exaggeration can involve the supernatural or surreal, alterations in the physical features of a character; or elements in the storyline itself. It is important to employ a certain level of restraint when using exaggeration. If a scene contains several elements, there should be a balance in how those elements are exaggerated in relation to each other, to avoid confusing or overawing the viewer.

11. Solid drawing

The principle of solid drawing means taking into account forms in three-dimensional space, or giving them volume and weight. The animator needs to be a skilled artist and has to understand the basics of three-dimensional shapes, anatomy, weight, balance, light and shadow, etc. For the classical animator, this

involved taking art classes and doing sketches from life. One thing in particular that Johnston and Thomas warned against was creating "twins": characters whose left and right sides mirrored each other, and looked lifeless. Modern-day computer animators draw less because of the facilities computers give them, yet their work benefits greatly from a basic understanding of animation principles, and their additions to basic computer animation.

12. Appeal

Appeal in a cartoon character corresponds to what would be called charisma in an actor. A character who is appealing is not necessarily sympathetic – villains or monsters can also be appealing – the important thing is that the viewer feels the character is real and interesting. There are several tricks for making a character connect better with the audience; for likable characters a symmetrical or particularly baby-like face tends to be effective. A complicated or hard to read face will lack appeal, it may more accurately be described as 'captivation' in the composition of the pose, or the character design.

Use of video – broadcast

Digital Video Broadcasting (DVB) is a set of standards that define digital broadcasting using existing satellite, cable, and terrestrial infrastructures. In the early 1990s, European broadcasters, consumer equipment manufacturers, and regulatory bodies formed the European Launching Group (ELG) to discuss introducing digital television (DTV) throughout Europe. The ELG realized that mutual respect and trust had to be established between members later became the DVB Project. Today, the DVB Project consists of over 220 organizations in more than 29 countries worldwide. DVB-compliant digital broadcasting and equipment is widely available and is distinguished by the DVB logo. Numerous DVB broadcast services are available in Europe, North and South America, Africa, Asia, and Australia. The term *digital television* is sometimes used as a synonym for DVB. However, the Advanced Television Systems Committee (ATSC) standard is the digital broadcasting standard used in the U.S.

Videostandards NTSC-PAL-SECAM-HDTV

ATSC

ATSC stands for Advanced Television Systems Committee, but the acronym is synonymous with the group's standard for digital television broadcast. ATSC is used for over-the-air transmission of HDTV signals, replacing the former analog standard NTSC. It can support video resolutions up to 1080p and 5.1 surround audio, and can be picked up on the same frequency UHF/VHF antennas as NTSC.

NTSC

NTSC stands for National Television Standards Committee, and is synonymous with the video transmission standard for North and Central America, including Mexico and Canada, and Japan. Its technical format is 525 lines per frame at roughly 30 frames per second refresh rate. The video is interlaced over the even and odd scanlines, for an apparent refresh rate of ~60fps.

In quality, NTSC is equivalent to a composite signal. but is not necessarily equivalent to the output from a video capture card that may claim to be NTSC-legal.

NTSC is no longer utilized in the United States, having been replaced with the digital ATSC standard in 2009.

PAL

PAL (Phase Alteration Line) is the European counterpart to the NTSC standard. It has a higher vertical resolution (625 lines per frame) but a lower refresh rate (25 frames per second) that can cause flickering. It is the standard for the UK, Western Europe, the Middle East, and parts of Africa and South America.

SECAM

SECAM (Systeme Electronic Pour Couleur Avec Memoire) is very similar to PAL. It specifies the same number of scan lines and frames per second, but differs in that chrominance (color) is FM modulated. It is the broadcast standard for France, Russia, and parts of Africa and Eastern Europe.

HDTV

High-definition television (HDTV) is a television system providing an image resolution that is of substantially higher resolution than that of standard-definition television. HDTV is the current standard video format used in most broadcasts: terrestrial broadcast television, cable television, satellite television, Blu-rays, and streaming video.

HDTV may be transmitted in various formats:

720p (HD Ready): 1280×720p: 923,600 pixels (~0.92 MP) per frame

1080i (Full HD) : 1920×1080i: 1,036,800 pixels (~1.04 MP) per field or 2,073,600 pixels (~2.07 MP) per frame

1080p (Full HD): 1920×1080p: 2,073,600 pixels (~2.07 megapixels) per frame

Some countries also use a non-standard CEA resolution, such as 1440×1080i: 777,600 pixels (~0.78 MP) per field or 1,555,200 pixels (~1.56 MP) per frame

Integration of computers and televisions

Television is perhaps the most important form of communication ever invented. It is certainly the most popular and influential in our society. It is an effortless window on the world, requiring of the viewer only the right time and the right channel, or for the nondiscriminating viewer, any time and any channel (except channel one).

Computer presentation of information could certainly benefit from the color, motion, and sound that television offers. Television viewers could similarly benefit from the control and personalization that is promised by computer technology.

Combining the two seems irresistible. They already seem to have much in common, such as CRT screens and programs and power cords. But they are different in significant ways, and those differences are barriers to reasonable integration.

The problems on the computer side will get fixed in the course of technical evolution, which should continue into the next century. We've been fortunate so far that not one of the early computer systems has been so popular that it couldn't be obsoleted (although we are dangerously close to having that happen with UNIX, and there is now some doubt as to whether even IBM can displace the PC). The worst features of computers, that they are underpowered and designed to be used by nerds, will improve over the long haul.

Television, unfortunately, has been spectacularly successful, and so is still crippled by the limitations of the electronics industry of 40 years ago. There are many new television systems on the horizon, a few of which promise to solve the integration problem, but for the time being we are stuck with what we've got.

These limitations are not noticed by audiences, and could be completely ignored if they were merely the esoterica of television engineers. Unfortunately, the television medium is far more specialized than you might suppose. Interface designers who ignore its limitations do so at their own peril.

Venue

Computer displays are generally designed for close viewing, usually in an office environment--most often as a solitary activity. The display is sharp and precise. Displays strongly emphasize text, sometimes exclusively so. Graphics and color are sometimes available. Displays are generally static. Only recently have computers been given interesting sound capabilities. There is still little understanding of how to use sound effectively beyond BEEPs, which usually indicate when the machine wants a human to perform an immediate action.

Television, on the other hand, was designed for distant viewing, usually in a living room environment, often as a group activity. The screen is alive with people, places, and products. The screen can present text, but viewers are not expected to receive much information by reading. The sound track is an essential part of the viewing experience. Indeed, most of the information is carried audibly. (You can prove this yourself. Try this demonstration: Watch a program with the sound turned all the way down. Then watch another program with the sound on, but with the picture brightness turned all the way down. Then stop and think.)

Television was designed for distant viewing because the electronics of the 1940s couldn't handle the additional information required to provide sufficient detail for close viewing. Television has lower resolution than most computer displays, so you have to get some distance from it to look good.

The correct viewing distance for a television viewer is as much as ten times what it is for a computer user. Where is the best place to sit in order to enjoy fully integrated interactive television, the arm chair or the desk chair? Many of the current generation of multimedia products, such as Compact Disc-Interactive, suffer from this ambiguity. The color images are best viewed from a distance, but the cursor-oriented interface wants to be close.

Overscan

Every pixel on a computer display is precious. Because the visible window is a rectangle, and the corners of CRTs are curved, the visible rectangle is inset, with sufficient black border to assure that even the corner pixels will be visible. Television, unfortunately, does not use such a border.

The first picture tubes used in television were more oval than rectangular. It was decided that the picture should fill every bit of the face of the screen, even if that meant that viewers would be unable to see the portions of the images that were near the edges, particularly in the corners.

This was well suited to the distant viewing assumption, but the uncertainty of what is visible on a viewer's screen (it can vary from set to set) causes problems even for the producers of television programs. They had to accept conventions of Safe Action Area and Safe Title Area, which are smaller rounded rectangles within the television frame. Most actions that happen within the Safe Action Area will be visible on most sets. All text should be confined to the Safe Title Area, which is visible on virtually all sets.

30 fps

Many computer systems have displays that run 30 or 60 frames per second, because it is commonly believed that television runs at a rate of 30 frames per second. This is incorrect for two reasons:

- Television doesn't really have frames, it has fields. A field is a half of a picture, every other line of a picture (sort of like looking through blinds). There is no guarantee that two fields make a coherent picture, or even which fields (this one and that one, or that one and the next one) make up a frame. This is the field dominance problem, and it makes television hostile to treating individual frames as discrete units of information.
- If television did have a frame rate, it would be 29.97 frames per second. The original black and white system was 30, but it was changed when color was introduced. This can make synchronization difficult. Movies transferred to television play a little longer, and the pitch in the sound track is lowered slightly. It also causes problems with timecode.

Timecode is a scheme for identifying every frame with a unique number, in the form hour:minute:second:frame, similar in function to the sector and track numbers on computer disk drives. For television, there are assumed to be 30 frames per second, but because the true rate is 29.97, over the course of a half hour you would go over by a couple of seconds. There is a special form of timecode called Drop Frame Timecode, which skips every thousandth frame number, so that the final time comes out right. However, it can be madness dealing with a noncontinuous number system in a linear medium, particularly if frame accuracy is required.

Interlace

Computers want to be able to deal with images as units. Television doesn't, because it interlaces. *Interlace* is a scheme for doubling the apparent frame rate at the price of a loss of vertical resolution and a lot of other problems. Pictures are transmitted as alternating fields of even lines and fields of odd lines.

Images coming from a television camera produce 59.94 fields per second. Each field is taken from a different instant in time. If there is any motion in the scene, it is not possible to do a freeze frame, because the image will be made up of two fields, forcing the image to flutter forward and backward in time. A still can be made by taking a single field and doubling it to make a frame, with a loss of image quality.

Twitter is a disturbing flicker caused by the content of one line being significantly different than its interfield neighbors. In extreme cases, it can cause the fields to separate visibly. Twitter can be a big problem for computer generated graphics, because twitter patterns are extremely common, particularly in text, boxes, and line drawings. The horizontal stripes in the Macintosh title bar cause terrible twitter. Twitter can be removed by filtering, but with a lose of detail and clarity.

Field dominance, as mentioned above, is the convention of deciding what a frame is: an odd field followed by an even, or an even followed by an odd. There

are two possible ways to do it; neither is better than the other, and neither is generally agreed upon. Some equipment is even, some is odd, some is random. This can be critical when dealing with frames as discrete objects, as in collections of stills. If the field dominance is wrong, instead of getting the two fields of a single image, you will get a field each of two different images, which looks sort of like a superimposition, except that it flickers like crazy.

Color

RCA Laboratories came up with an ingenious method for inserting color into a television channel that could still be viewed by unmodified black and white sets. But it didn't come for free. The placing of all of the luminance and color information into a single composite signal causes some special problems.

The color space of television is not the same as that in a computer RGB system. A computer can display colors that television can't, and trying to encode those colors into a composite television signal can cause aliasing. (*Aliasing* means "something you don't want.")

Television cannot change colors as quickly as a computer display can. This can also cause aliasing and detail loss in computer-generated pictures on television. There are other problems, such as chroma crawl and cross-color, which are beyond the scope of this article. But they're there.

Videotape

In the Golden Age, there was no good way to save programs, so all programs were produced live. Videotape was developed years later.

Our problems with videotape are due to two sources: First, the design of television gave no thought to videotape or videodisc, which results in the generation loss problem. Second, the control aspects of interactive television require greater precision than broadcasters require, which creates the frame accuracy problem.

Generation loss is the degradation in the quality of a program every time it is copied. Because videotape is not spliced, the only way to assemble material is by copying it, and with each copy it gets worse. This problem is being corrected by the application of digital technology, and can be considered solved, at least at some locations. It remains to make digital video recording cheap and widely available.

The frame accuracy problem is another story. A computer storage device that, when requested to deliver a particular sector, instead delivered a different sector would be considered defective. In the world of videotape editing, no one can notice that an edit is off by $1/29.97$ seconds, so precise, accurate-to-the-frame

behavior is not always demanded of professional video gear. This can make the production of computer interactive video material extremely difficult, because if your interest is in a particular frame, the off-by-one frame is totally wrong.

Other Television

This chapter has mostly concentrated on the NTSC system used in the United States. Other countries use the PAL and SECAM systems, which have their own worlds of problems. These are compounded for the designer who wants to make programs that work in all nations.

A number of new television systems are being proposed to replace or enhance the existing systems. To the extent these have progressive scan (noninterlaced), component color (not composite), a frame rate that can be expressed as a whole number (60 fps, not 59.94 fps), and digital encoding (not analog), then computers and television can be integrated successfully, and the limitations listed above will be techno-historical trivia.

The convergence of television and computer media is extremely desirable. Computer technology would benefit from animated displays and high-bandwidth digital video storage. Camcorders would be wonderful computer input devices. Television technology would benefit from being less mysterious and more straightforward, eliminating the video priesthood in much the same way that good interface design will eliminate the computer priesthood.

Although desirable, this convergence is not inevitable. Some of the worst use of computers is in television engineering. Some of the worst television is "desktop video." The full power of a new medium based on the well considered unification of computer and television technology is distant and elusive. The design challenge is not technologically difficult. It requires only a commitment to excellence and a willingness to accept change.

This New Television could make the tools of production available to every individual. The New Media Literacy could grant people a significant power over the technology of the Information Age. The New Television could perhaps be the most important form of communication ever invented.