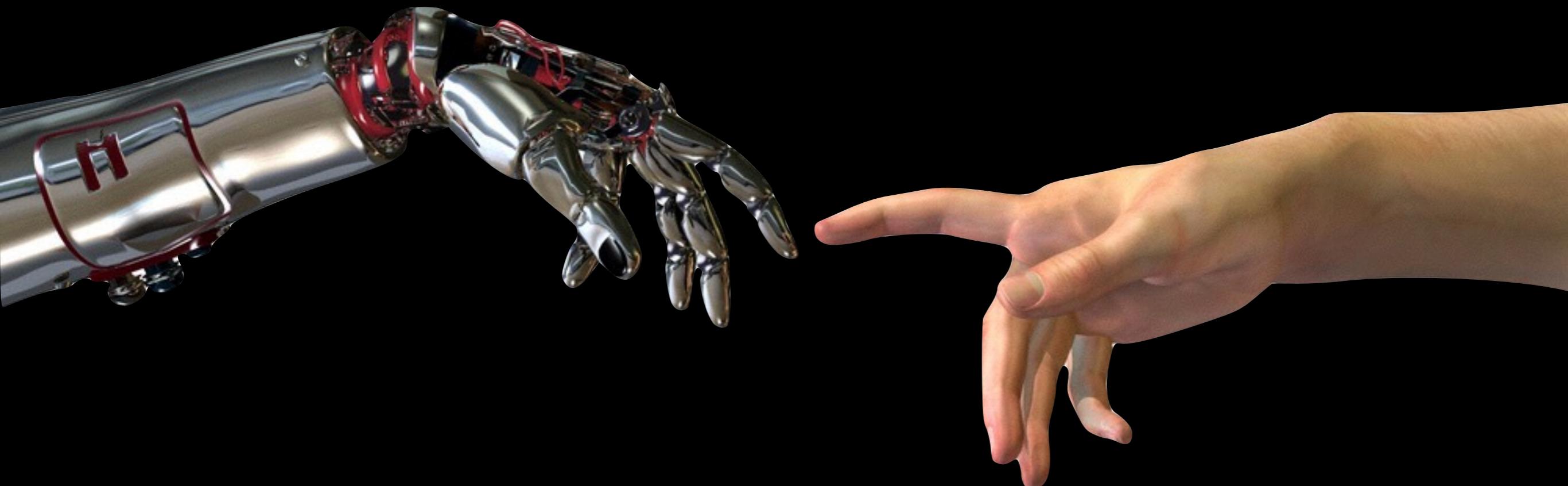


MULTIMEDIA TECHNOLOGY & APPLICATION



LECTURERS

- Dr Nurulfajar bin Abd Manap
(nurulfajar@utem.edu.my) - S1, S2
- Dr Low Yin Fen
(yinfen@utem.edu.my) - S1, S2
- Dr Norhashimah Mohd Saad
(norhashimah@utem.edu.my) - S3, S4
- Pn Noor Mazlina Mahmood
(mazlina@utem.edu.my) - S3, S4

RULES & REGULATIONS

TOPICS OVERVIEW

- Introduction to Multimedia & Authoring
- Issues of Multimedia Application & Future Direction
- Multimedia Data
- Audio Technology
- Image Technology
- Video Technology

EVALUATIONS

- COURSEWORKS (40%)
 - TEST (15%)
 - ASSIGNMENT (25%)
- FINAL EXAM (60%)

INTRODUCTION TO MULTIMEDIA

Learning Outcomes

- By the end of this chapter, student should be able to:
 - Identify the definition of multimedia systems, its components and its related technology
 - Elaborate on the history of multimedia
 - Distinguish between linear and non-linear type of multimedia
 - Familiarize with wide variation of different types of multimedia viewing and authoring software tool
 - Classify the multimedia format based on its file types

BACKGROUND OF MULTIMEDIA

What is Multimedia?

- Multimedia is a computer-based interactive communications process that incorporates text, graphics, sound, animation, and video
- Creative and resourceful
 - Beautiful and full of knowledge
 - Key feature of multimedia
- Multimedia is a combination of-but not limited to text, art, sound, animation, and video.

History of Multimedia

Newspaper first
mass
communication
medium



In 1895-first
wireless radio
transmission at
Pontecchio, Italy.
1901, radio waves
is beamed across
the Atlantic.



Television
new
media for
the 20th
century.



1970's-
Pong, Atari
Apple, IBM
and the PC
revolution



Ref. Link:

Great moments in multimedia history
Wiki: multimedia
A story of invention

- 1.
- 2.
- 3.

History of Multimedia

1980's-GUI's
and the mouse
and other
technologies

1990's-Multimedia
Explosion: WWW, CD-I,
Interactive books, 3D

Future directions
Technology
convergence,
education,
entertainment
other appliances

- 1.
- 2.
- 3.

Ref. Link:
Great moments in multimedia history
[Wiki: multimedia](#)
[A story of invention](#)

Multimedia element

TEXT

IMAGES

AUDIO

GRAPHICS

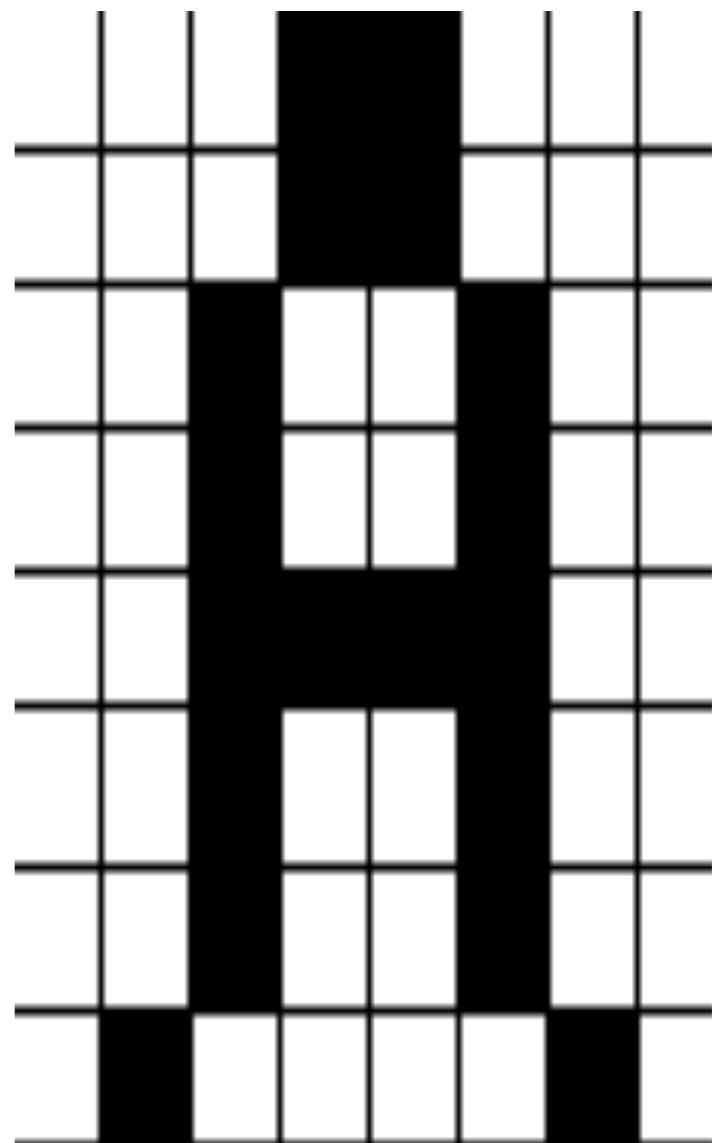
VIDEO

Text

- Early PC's were running under MS-DOS: only displayed text in one size and one color.
- Text on those early PC's was displayed using the ASCII charter set which was a series of 2 numbers that could be sent to the monitor.
- Each of those two digit numbers represented an alpha-numerical character. For example, the ASCII character code for a lower case a is 97 while the uppercase is 65.

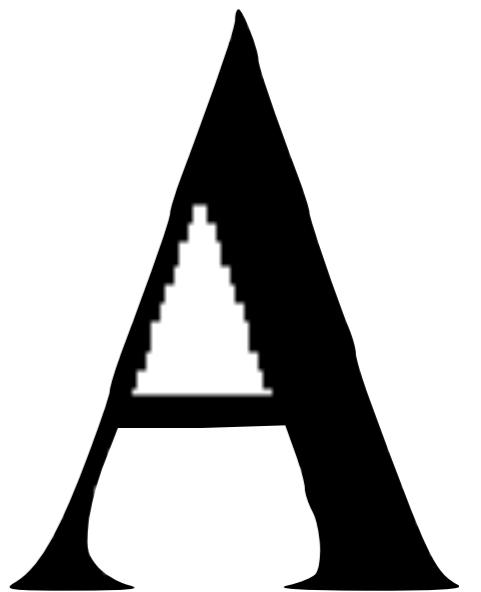
Text

- A text charter was 8 pixels high and 8 pixels wide
- When a program sent a character 65 to the screen a helper systems program called ANSI.SYS would send a signal to the proper location turning on and off 64 dots appropriately to make an image of the letter A.



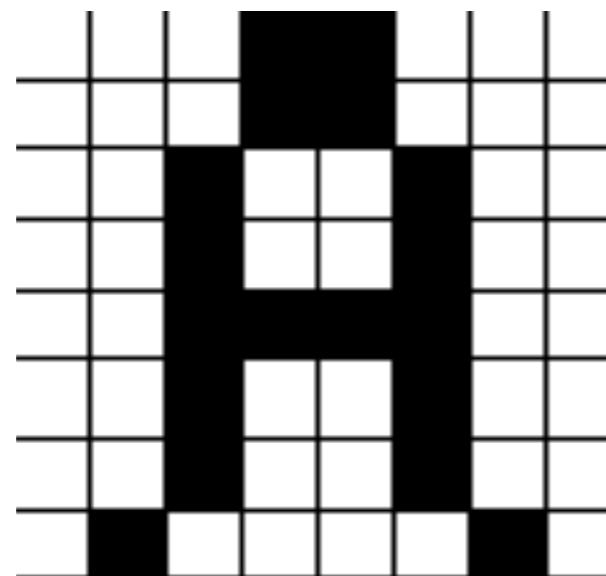
Text

- Later with the use of color monitors which had multiple size modes which made it possible to display larger text (still using the ASCII system).
- Windows and other graphical operating systems, used a font (a miniature picture) to paint text on the screen in graphical mode.



Images

- Turning on or off monitor pixels in graphics mode can create an alphanumeric character. Obviously the same process was used to create a picture in the earlier computers.



Images

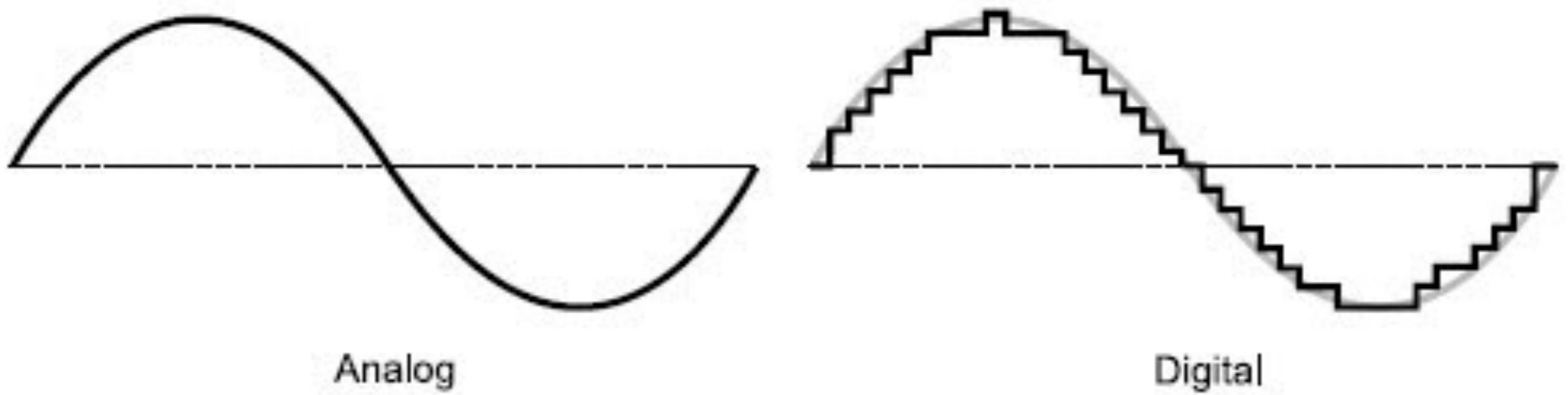
- The two shades of gray are added, two shade of blue to the original black and white.
- There are dozens of computer color mixing systems or also known as color model are used with an endless number of custom palettes.
- All computer colors are created by mixing **RED GREEN** and **BLUE** light



Audio

- Refers to the reproduction and transmission of sound stored in a digital format. This includes CDs as well as any sound files stored on a computer.
- In the contrary application, the telephone system is based on an analog representation of sound.

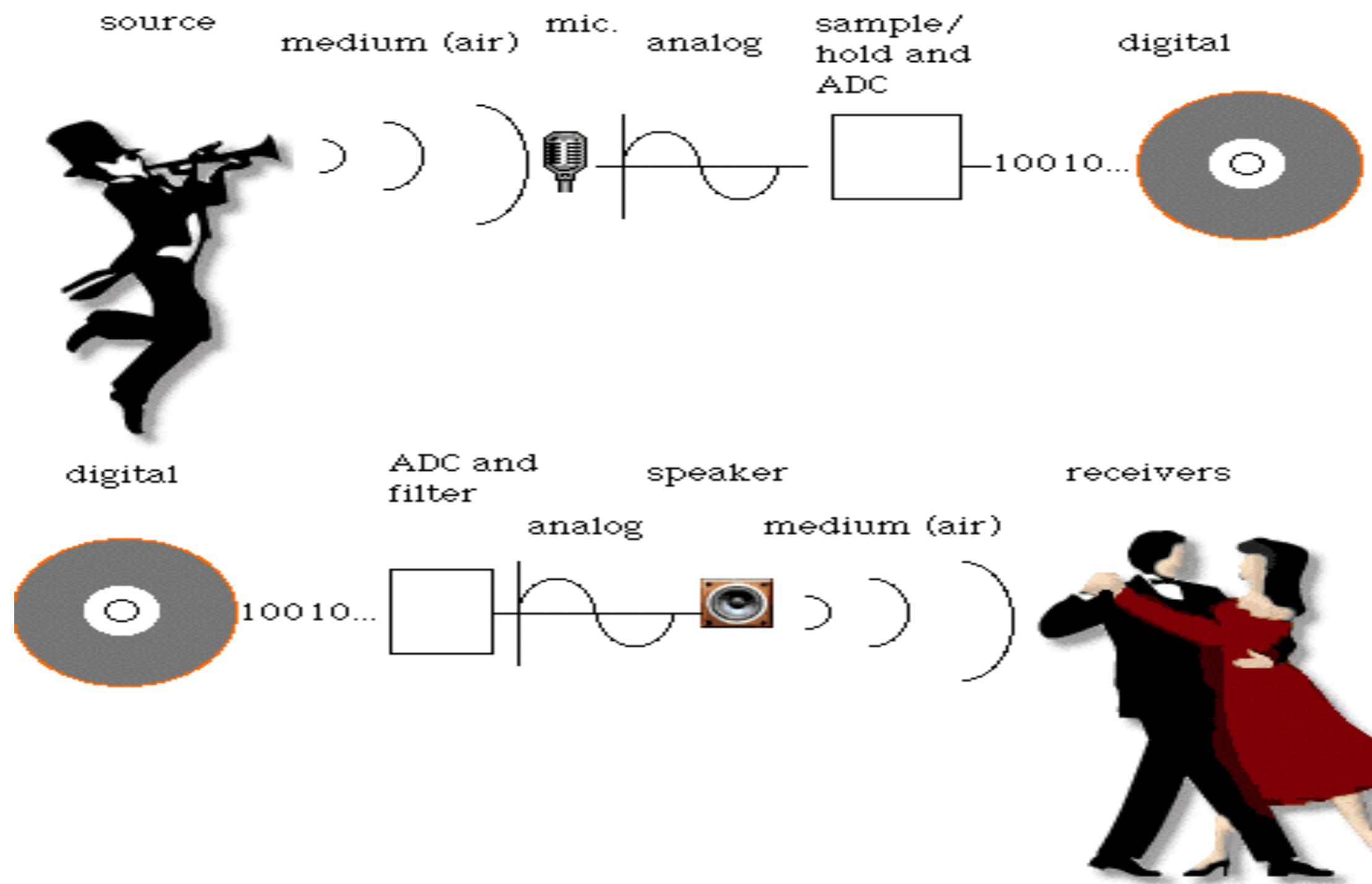
Audio



Audio

- Recording purposes: Soundcard that is coming with an Analog-to-Digital Converter (ADC) is used
- And a Digital-to-Analog Converter (DAC) of the sound card is used for playing audio.
- The operating system talks to the soundcard to handle the recording and playback, and the sound player/editor software talks to the operating system so that you can capture sounds to a file, edit them, and mix multiple tracks while playing.

Audio



Animation/ Graphics

- Animation is a sequential series of still images that create an illusion of motion.



Animation

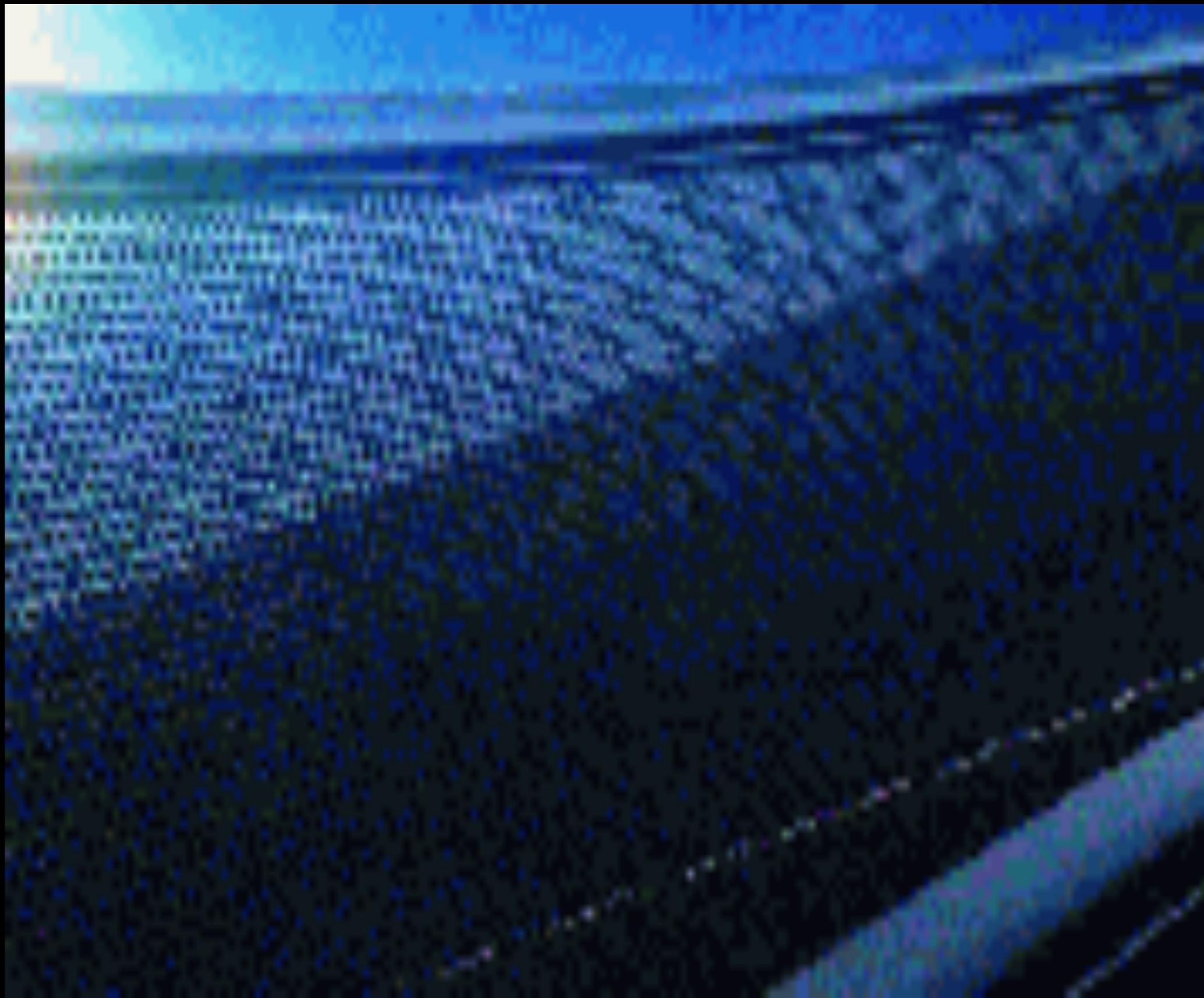
- Note the difference between animation and video.
- Whereas video takes continuous motion and breaks it up into discrete frames,
- Animation starts with independent pictures and puts them together to form the illusion of continuous motion.

Animation

- 2D animation figures are created and/or edited on the computer using 2D bitmap graphics or created and edited using 2D vector graphics.
- 3D animation are digitally modeled and manipulated by an animator.

Video

- Unlike an animation that we can create from drawings or images a video is created by a photographic process and converted or ported to a computer in sets of Frames where each frame has data stored in every pixel.
- We measure the rate at which frames are displayed in **Frames Per Second (FPS)**.
- Digital video can be copied with no degradation in quality.





gifbin.com

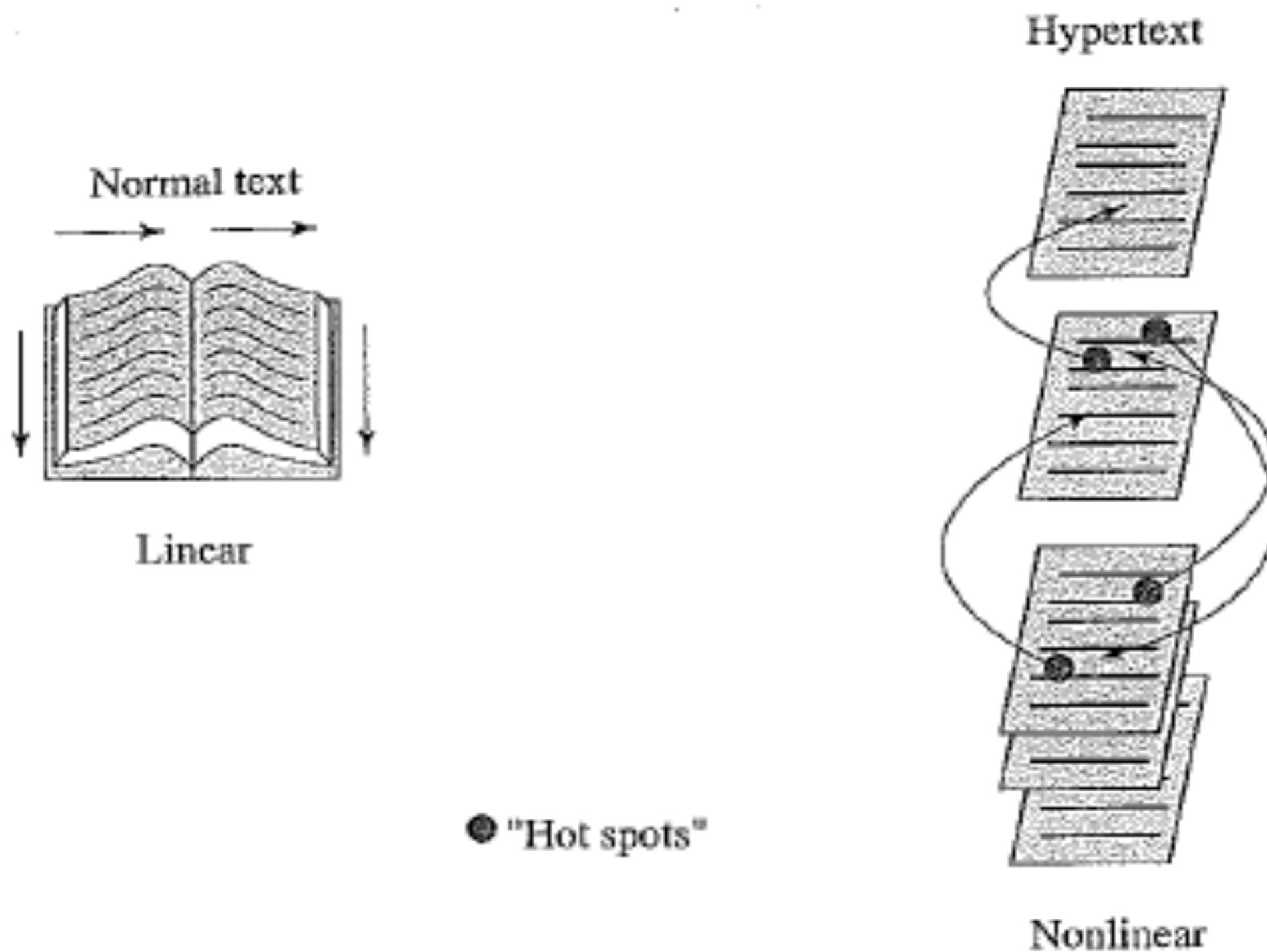


Hypertext



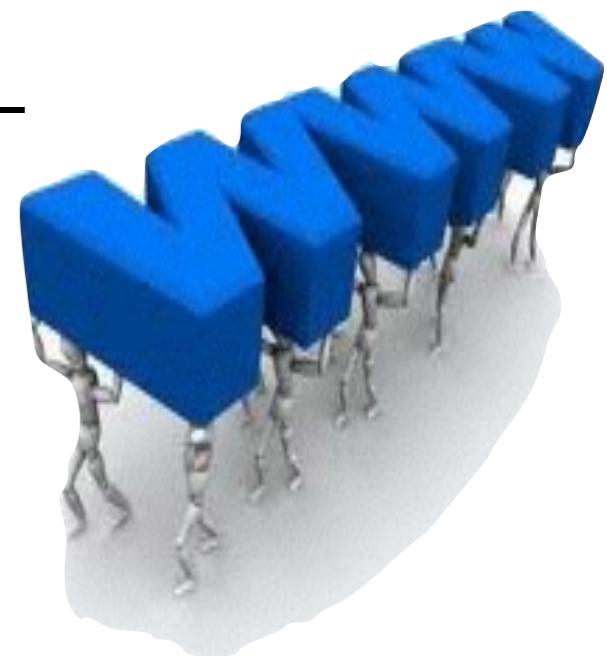
- ***Hypertext*** is a text which contains links to other texts or page
- The term was invented by Ted Nelson around 1965.

Hypertext



HyperMedia

- **HyperMedia** is not constrained to be text-based. It can include other media, e.g., graphics, images, and especially the continuous media - sound and video.
- Apparently, Ted Nelson was also the first to use this term.
- The World Wide Web (WWW) is the best example of hypermedia applications.



World Wide Web

- WWW is the largest and most commonly used **hypermedia** application.
- WWW technology is maintained and developed by the World Wide Web Consortium (W3C).
- 3 goals for WWW :
 - Universal access of web resources
 - Effectiveness of navigating available information
 - Responsible use of posted material
- Multimedia application – digital video editing and production systems, e-newspapers and magazines, games, video conferencing, interactive movies and etc.

World Wide Web



NCSA Mosaic - 1993



Safari - 2003



Netscape Navigator - 1994



>



Firebird (1998) > Firefox - 2004



Internet Explorer - 1995



Chrome - 2008



Opera - 1996



Flock



Konqueror



xB Browser



Maxthon



Camino

World Wide Web

- Multimedia incorporates different media: sound, images, video.
- The world wide web is a global hypermedia system.
- Animation and video can show information that is difficult to convey statically.
- Applications of hypermedia include online help, education and e-commerce
- Dynamic web content can be used for simple online demonstration or for complete web-based business applications.

RECAP

- Multimedia Elements
- Multimedia Authoring
- Differences between animation and video

MULTIMEDIA SYSTEM

- A ***Multimedia System*** is a system capable of processing multimedia data and applications.
- A Multimedia System is characterised by the processing, storage, generation, manipulation and rendition of Multimedia information.

Characteristics of Multimedia System

A Multimedia system has **FOUR (4)** basic characteristics: (*C-I-D-I*)

- Multimedia systems must be ***computed control.***
- Multimedia systems are ***integrated.***
- The information they handle must be represented ***digitally.***
- The interface to the final presentation of media is usually ***interactive.***

Components of Multimedia System

- ✖ Capture devices

Video Camera, Video Recorder, Audio Microphone, Keyboards, mouse, graphics tablets, 3D input devices, tactile sensors, VR devices. Digitizing/Sampling Hardware

- ✖ Storage Devices

Hard disks, CD-ROMs, Zip drives, DVD, etc

- ✖ Communication Networks

Ethernet, Token Ring, FDDI, ATM, Intranets, Internets.

- ✖ Computer Systems

Multimedia Desktop machines, Workstations, MPEG/VIDEO/DSP Hardware

- ✖ Display Devices

CD-quality speakers, HDTV, SVGA, Hi-Res monitors, Colour printers etc.



http://





revolution in evolution

Highlights from the Journey to 1 Billion PCs



For more information, please visit: <http://www.intel.com>

TechNet, Intel, Intel Inside, Intel Logo, Intel Pentium, Intel Processor, Intel Pro, Intel Pro/5, Intel Pro/55, Intel Pro/60, Intel Pro/70, Intel Pro/80, Intel Pro/90, Intel Pro/95, Intel Pro/96, Intel Pro/97, Intel Pro/98, Intel Pro/99, Intel Pro/00, Intel Pro/01, Intel Pro/02, Intel Pro/03, Intel Pro/04, Intel Pro/05, Intel Pro/06, Intel Pro/07, Intel Pro/08, Intel Pro/09, Intel Pro/10, Intel Pro/11, Intel Pro/12, Intel Pro/13, Intel Pro/14, Intel Pro/15, Intel Pro/16, Intel Pro/17, Intel Pro/18, Intel Pro/19, Intel Pro/20, Intel Pro/21, Intel Pro/22, Intel Pro/23, Intel Pro/24, Intel Pro/25, Intel Pro/26, Intel Pro/27, Intel Pro/28, Intel Pro/29, Intel Pro/30, Intel Pro/31, Intel Pro/32, Intel Pro/33, Intel Pro/34, Intel Pro/35, Intel Pro/36, Intel Pro/37, Intel Pro/38, Intel Pro/39, Intel Pro/40, Intel Pro/41, Intel Pro/42, Intel Pro/43, Intel Pro/44, Intel Pro/45, Intel Pro/46, Intel Pro/47, Intel Pro/48, Intel Pro/49, Intel Pro/50, Intel Pro/51, Intel Pro/52, Intel Pro/53, Intel Pro/54, Intel Pro/55, Intel Pro/56, Intel Pro/57, Intel Pro/58, Intel Pro/59, Intel Pro/60, Intel Pro/61, Intel Pro/62, Intel Pro/63, Intel Pro/64, Intel Pro/65, Intel Pro/66, Intel Pro/67, Intel Pro/68, Intel Pro/69, Intel Pro/70, Intel Pro/71, Intel Pro/72, Intel Pro/73, Intel Pro/74, Intel Pro/75, Intel Pro/76, Intel Pro/77, Intel Pro/78, Intel Pro/79, Intel Pro/80, Intel Pro/81, Intel Pro/82, Intel Pro/83, Intel Pro/84, Intel Pro/85, Intel Pro/86, Intel Pro/87, Intel Pro/88, Intel Pro/89, Intel Pro/90, Intel Pro/91, Intel Pro/92, Intel Pro/93, Intel Pro/94, Intel Pro/95, Intel Pro/96, Intel Pro/97, Intel Pro/98, Intel Pro/99, Intel Pro/00, Intel Pro/01, Intel Pro/02, Intel Pro/03, Intel Pro/04, Intel Pro/05, Intel Pro/06, Intel Pro/07, Intel Pro/08, Intel Pro/09, Intel Pro/10, Intel Pro/11, Intel Pro/12, Intel Pro/13, Intel Pro/14, Intel Pro/15, Intel Pro/16, Intel Pro/17, Intel Pro/18, Intel Pro/19, Intel Pro/20, Intel Pro/21, Intel Pro/22, Intel Pro/23, Intel Pro/24, Intel Pro/25, Intel Pro/26, Intel Pro/27, Intel Pro/28, Intel Pro/29, Intel Pro/30, Intel Pro/31, Intel Pro/32, Intel Pro/33, Intel Pro/34, Intel Pro/35, Intel Pro/36, Intel Pro/37, Intel Pro/38, Intel Pro/39, Intel Pro/40, Intel Pro/41, Intel Pro/42, Intel Pro/43, Intel Pro/44, Intel Pro/45, Intel Pro/46, Intel Pro/47, Intel Pro/48, Intel Pro/49, Intel Pro/50, Intel Pro/51, Intel Pro/52, Intel Pro/53, Intel Pro/54, Intel Pro/55, Intel Pro/56, Intel Pro/57, Intel Pro/58, Intel Pro/59, Intel Pro/60, Intel Pro/61, Intel Pro/62, Intel Pro/63, Intel Pro/64, Intel Pro/65, Intel Pro/66, Intel Pro/67, Intel Pro/68, Intel Pro/69, Intel Pro/70, Intel Pro/71, Intel Pro/72, Intel Pro/73, Intel Pro/74, Intel Pro/75, Intel Pro/76, Intel Pro/77, Intel Pro/78, Intel Pro/79, Intel Pro/80, Intel Pro/81, Intel Pro/82, Intel Pro/83, Intel Pro/84, Intel Pro/85, Intel Pro/86, Intel Pro/87, Intel Pro/88, Intel Pro/89, Intel Pro/90, Intel Pro/91, Intel Pro/92, Intel Pro/93, Intel Pro/94, Intel Pro/95, Intel Pro/96, Intel Pro/97, Intel Pro/98, Intel Pro/99, Intel Pro/00, Intel Pro/01, Intel Pro/02, Intel Pro/03, Intel Pro/04, Intel Pro/05, Intel Pro/06, Intel Pro/07, Intel Pro/08, Intel Pro/09, Intel Pro/10, Intel Pro/11, Intel Pro/12, Intel Pro/13, Intel Pro/14, Intel Pro/15, Intel Pro/16, Intel Pro/17, Intel Pro/18, Intel Pro/19, Intel Pro/20, Intel Pro/21, Intel Pro/22, Intel Pro/23, Intel Pro/24, Intel Pro/25, Intel Pro/26, Intel Pro/27, Intel Pro/28, Intel Pro/29, Intel Pro/30, Intel Pro/31, Intel Pro/32, Intel Pro/33, Intel Pro/34, Intel Pro/35, Intel Pro/36, Intel Pro/37, Intel Pro/38, Intel Pro/39, Intel Pro/40, Intel Pro/41, Intel Pro/42, Intel Pro/43, Intel Pro/44, Intel Pro/45, Intel Pro/46, Intel Pro/47, Intel Pro/48, Intel Pro/49, Intel Pro/50, Intel Pro/51, Intel Pro/52, Intel Pro/53, Intel Pro/54, Intel Pro/55, Intel Pro/56, Intel Pro/57, Intel Pro/58, Intel Pro/59, Intel Pro/60, Intel Pro/61, Intel Pro/62, Intel Pro/63, Intel Pro/64, Intel Pro/65, Intel Pro/66, Intel Pro/67, Intel Pro/68, Intel Pro/69, Intel Pro/70, Intel Pro/71, Intel Pro/72, Intel Pro/73, Intel Pro/74, Intel Pro/75, Intel Pro/76, Intel Pro/77, Intel Pro/78, Intel Pro/79, Intel Pro/80, Intel Pro/81, Intel Pro/82, Intel Pro/83, Intel Pro/84, Intel Pro/85, Intel Pro/86, Intel Pro/87, Intel Pro/88, Intel Pro/89, Intel Pro/90, Intel Pro/91, Intel Pro/92, Intel Pro/93, Intel Pro/94, Intel Pro/95, Intel Pro/96, Intel Pro/97, Intel Pro/98, Intel Pro/99, Intel Pro/00, Intel Pro/01, Intel Pro/02, Intel Pro/03, Intel Pro/04, Intel Pro/05, Intel Pro/06, Intel Pro/07, Intel Pro/08, Intel Pro/09, Intel Pro/10, Intel Pro/11, Intel Pro/12, Intel Pro/13, Intel Pro/14, Intel Pro/15, Intel Pro/16, Intel Pro/17, Intel Pro/18, Intel Pro/19, Intel Pro/20, Intel Pro/21, Intel Pro/22, Intel Pro/23, Intel Pro/24, Intel Pro/25, Intel Pro/26, Intel Pro/27, Intel Pro/28, Intel Pro/29, Intel Pro/30, Intel Pro/31, Intel Pro/32, Intel Pro/33, Intel Pro/34, Intel Pro/35, Intel Pro/36, Intel Pro/37, Intel Pro/38, Intel Pro/39, Intel Pro/40, Intel Pro/41, Intel Pro/42, Intel Pro/43, Intel Pro/44, Intel Pro/45, Intel Pro/46, Intel Pro/47, Intel Pro/48, Intel Pro/49, Intel Pro/50, Intel Pro/51, Intel Pro/52, Intel Pro/53, Intel Pro/54, Intel Pro/55, Intel Pro/56, Intel Pro/57, Intel Pro/58, Intel Pro/59, Intel Pro/60, Intel Pro/61, Intel Pro/62, Intel Pro/63, Intel Pro/64, Intel Pro/65, Intel Pro/66, Intel Pro/67, Intel Pro/68, Intel Pro/69, Intel Pro/70, Intel Pro/71, Intel Pro/72, Intel Pro/73, Intel Pro/74, Intel Pro/75, Intel Pro/76, Intel Pro/77, Intel Pro/78, Intel Pro/79, Intel Pro/80, Intel Pro/81, Intel Pro/82, Intel Pro/83, Intel Pro/84, Intel Pro/85, Intel Pro/86, Intel Pro/87, Intel Pro/88, Intel Pro/89, Intel Pro/90, Intel Pro/91, Intel Pro/92, Intel Pro/93, Intel Pro/94, Intel Pro/95, Intel Pro/96, Intel Pro/97, Intel Pro/98, Intel Pro/99, Intel Pro/00, Intel Pro/01, Intel Pro/02, Intel Pro/03, Intel Pro/04, Intel Pro/05, Intel Pro/06, Intel Pro/07, Intel Pro/08, Intel Pro/09, Intel Pro/10, Intel Pro/11, Intel Pro/12, Intel Pro/13, Intel Pro/14, Intel Pro/15, Intel Pro/16, Intel Pro/17, Intel Pro/18, Intel Pro/19, Intel Pro/20, Intel Pro/21, Intel Pro/22, Intel Pro/23, Intel Pro/24, Intel Pro/25, Intel Pro/26, Intel Pro/27, Intel Pro/28, Intel Pro/29, Intel Pro/30, Intel Pro/31, Intel Pro/32, Intel Pro/33, Intel Pro/34, Intel Pro/35, Intel Pro/36, Intel Pro/37, Intel Pro/38, Intel Pro/39, Intel Pro/40, Intel Pro/41, Intel Pro/42, Intel Pro/43, Intel Pro/44, Intel Pro/45, Intel Pro/46, Intel Pro/47, Intel Pro/48, Intel Pro/49, Intel Pro/50, Intel Pro/51, Intel Pro/52, Intel Pro/53, Intel Pro/54, Intel Pro/55, Intel Pro/56, Intel Pro/57, Intel Pro/58, Intel Pro/59, Intel Pro/60, Intel Pro/61, Intel Pro/62, Intel Pro/63, Intel Pro/64, Intel Pro/65, Intel Pro/66, Intel Pro/67, Intel Pro/68, Intel Pro/69, Intel Pro/70, Intel Pro/71, Intel Pro/72, Intel Pro/73, Intel Pro/74, Intel Pro/75, Intel Pro/76, Intel Pro/77, Intel Pro/78, Intel Pro/79, Intel Pro/80, Intel Pro/81, Intel Pro/82, Intel Pro/83, Intel Pro/84, Intel Pro/85, Intel Pro/86, Intel Pro/87, Intel Pro/88, Intel Pro/89, Intel Pro/90, Intel Pro/91, Intel Pro/92, Intel Pro/93, Intel Pro/94, Intel Pro/95, Intel Pro/96, Intel Pro/97, Intel Pro/98, Intel Pro/99, Intel Pro/00, Intel Pro/01, Intel Pro/02, Intel Pro/03, Intel Pro/04, Intel Pro/05, Intel Pro/06, Intel Pro/07, Intel Pro/08, Intel Pro/09, Intel Pro/10, Intel Pro/11, Intel Pro/12, Intel Pro/13, Intel Pro/14, Intel Pro/15, Intel Pro/16, Intel Pro/17, Intel Pro/18, Intel Pro/19, Intel Pro/20, Intel Pro/21, Intel Pro/22, Intel Pro/23, Intel Pro/24, Intel Pro/25, Intel Pro/26, Intel Pro/27, Intel Pro/28, Intel Pro/29, Intel Pro/30, Intel Pro/31, Intel Pro/32, Intel Pro/33, Intel Pro/34, Intel Pro/35, Intel Pro/36, Intel Pro/37, Intel Pro/38, Intel Pro/39, Intel Pro/40, Intel Pro/41, Intel Pro/42, Intel Pro/43, Intel Pro/44, Intel Pro/45, Intel Pro/46, Intel Pro/47, Intel Pro/48, Intel Pro/49, Intel Pro/50, Intel Pro/51, Intel Pro/52, Intel Pro/53, Intel Pro/54, Intel Pro/55, Intel Pro/56, Intel Pro/57, Intel Pro/58, Intel Pro/59, Intel Pro/60, Intel Pro/61, Intel Pro/62, Intel Pro/63, Intel Pro/64, Intel Pro/65, Intel Pro/66, Intel Pro/67, Intel Pro/68, Intel Pro/69, Intel Pro/70, Intel Pro/71, Intel Pro/72, Intel Pro/73, Intel Pro/74, Intel Pro/75, Intel Pro/76, Intel Pro/77, Intel Pro/78, Intel Pro/79, Intel Pro/80, Intel Pro/81, Intel Pro/82, Intel Pro/83, Intel Pro/84, Intel Pro/85, Intel Pro/86, Intel Pro/87, Intel Pro/88, Intel Pro/89, Intel Pro/90, Intel Pro/91, Intel Pro/92, Intel Pro/93, Intel Pro/94, Intel Pro/95, Intel Pro/96, Intel Pro/97, Intel Pro/98, Intel Pro/99, Intel Pro/00, Intel Pro/01, Intel Pro/02, Intel Pro/03, Intel Pro/04, Intel Pro/05, Intel Pro/06, Intel Pro/07, Intel Pro/08, Intel Pro/09, Intel Pro/10, Intel Pro/11, Intel Pro/12, Intel Pro/13, Intel Pro/14, Intel Pro/15, Intel Pro/16, Intel Pro/17, Intel Pro/18, Intel Pro/19, Intel Pro/20, Intel Pro/21, Intel Pro/22, Intel Pro/23, Intel Pro/24, Intel Pro/25, Intel Pro/26, Intel Pro/27, Intel Pro/28, Intel Pro/29, Intel Pro/30, Intel Pro/31, Intel Pro/32, Intel Pro/33, Intel Pro/34, Intel Pro/35, Intel Pro/36, Intel Pro/37, Intel Pro/38, Intel Pro/39, Intel Pro/40, Intel Pro/41, Intel Pro/42, Intel Pro/43, Intel Pro/44, Intel Pro/45, Intel Pro/46, Intel Pro/47, Intel Pro/48, Intel Pro/49, Intel Pro/50, Intel Pro/51, Intel Pro/52, Intel Pro/53, Intel Pro/54, Intel Pro/55, Intel Pro/56, Intel Pro/57, Intel Pro/58, Intel Pro/59, Intel Pro/60, Intel Pro/61, Intel Pro/62, Intel Pro/63, Intel Pro/64, Intel Pro/65, Intel Pro/66, Intel Pro/67, Intel Pro/68, Intel Pro/69, Intel Pro/70, Intel Pro/71, Intel Pro/72, Intel Pro/73, Intel Pro/74, Intel Pro/75, Intel Pro/76, Intel Pro/77, Intel Pro/78, Intel Pro/79, Intel Pro/80, Intel Pro/81, Intel Pro/82, Intel Pro/83, Intel Pro/84, Intel Pro/85, Intel Pro/86, Intel Pro/87, Intel Pro/88, Intel Pro/89, Intel Pro/90, Intel Pro/91, Intel Pro/92, Intel Pro/93, Intel Pro/94, Intel Pro/95, Intel Pro/96, Intel Pro/97, Intel Pro/98, Intel Pro/99, Intel Pro/00, Intel Pro/01, Intel Pro/02, Intel Pro/03, Intel Pro/04, Intel Pro/05, Intel Pro/06, Intel Pro/07, Intel Pro/08, Intel Pro/09, Intel Pro/10, Intel Pro/11, Intel Pro/12, Intel Pro/13, Intel Pro/14, Intel Pro/15, Intel Pro/16, Intel Pro/17, Intel Pro/18, Intel Pro/19, Intel Pro/20, Intel Pro/21, Intel Pro/22, Intel Pro/23, Intel Pro/24, Intel Pro/25, Intel Pro/26, Intel Pro/27, Intel Pro/28, Intel Pro/29, Intel Pro/30, Intel Pro/31, Intel Pro/32, Intel Pro/33, Intel Pro/34, Intel Pro/35, Intel Pro/36, Intel Pro/37, Intel Pro/38, Intel Pro/39, Intel Pro/40, Intel Pro/41, Intel Pro/42, Intel Pro/43, Intel Pro/44, Intel Pro/45, Intel Pro/46, Intel Pro/47, Intel Pro/48, Intel Pro/49, Intel Pro/50, Intel Pro/51, Intel Pro/52, Intel Pro/53, Intel Pro/54, Intel Pro/55, Intel Pro/56, Intel Pro/57, Intel Pro/58, Intel Pro/59, Intel Pro/60, Intel Pro/61, Intel Pro/62, Intel Pro/63, Intel Pro/64, Intel Pro/65, Intel Pro/66, Intel Pro/67, Intel Pro/68, Intel Pro/69, Intel Pro/70, Intel Pro/71, Intel Pro/72, Intel Pro/73, Intel Pro/74, Intel Pro/75, Intel Pro/76, Intel Pro/77, Intel Pro/78, Intel Pro/79, Intel Pro/80, Intel Pro/81, Intel Pro/82, Intel Pro/83, Intel Pro/84, Intel Pro/85, Intel Pro/86, Intel Pro/87, Intel Pro/88, Intel Pro/89, Intel Pro/90, Intel Pro/91, Intel Pro/92, Intel Pro/93, Intel Pro/94, Intel Pro/95, Intel Pro/96, Intel Pro/97, Intel Pro/98, Intel Pro/99, Intel Pro/00, Intel Pro/01, Intel Pro/02, Intel Pro/03, Intel Pro/04, Intel Pro/05, Intel Pro/06, Intel Pro/07, Intel Pro/08, Intel Pro/09, Intel Pro/10, Intel Pro/11, Intel Pro/12, Intel Pro/13, Intel Pro/14, Intel Pro/15, Intel Pro/16, Intel Pro/17, Intel Pro/18, Intel Pro/19, Intel Pro/20, Intel Pro/21, Intel Pro/22, Intel Pro/23, Intel Pro/24, Intel Pro/25, Intel Pro/26, Intel Pro/27, Intel Pro/28, Intel Pro/29, Intel Pro/30, Intel Pro/31, Intel Pro/32, Intel Pro/33, Intel Pro/34, Intel Pro/35, Intel Pro/36, Intel Pro/37, Intel Pro/38, Intel Pro/39, Intel Pro/40, Intel Pro/41, Intel Pro/42, Intel Pro/43, Intel Pro/44, Intel Pro/45, Intel Pro/46, Intel Pro/47, Intel Pro/48, Intel Pro/49, Intel Pro/50, Intel Pro/51, Intel Pro/52, Intel Pro/53, Intel Pro/54, Intel Pro/55, Intel Pro/56, Intel Pro/57, Intel Pro/58, Intel Pro/59, Intel Pro/60, Intel Pro/61, Intel Pro/62, Intel Pro/63, Intel Pro/64, Intel Pro/65, Intel Pro/66, Intel Pro/67, Intel Pro/68, Intel Pro/69, Intel Pro/70, Intel Pro/71, Intel Pro/72, Intel Pro/73, Intel Pro/74, Intel Pro/75, Intel Pro/76, Intel Pro/77, Intel Pro/78, Intel Pro/79, Intel Pro/80, Intel Pro/81, Intel Pro/82, Intel Pro/83, Intel Pro/84, Intel Pro/85, Intel Pro/86, Intel Pro/87, Intel Pro/88, Intel Pro/89, Intel Pro/90, Intel Pro/91, Intel Pro/92, Intel Pro/93, Intel Pro/94, Intel Pro/95, Intel Pro/96, Intel Pro/97, Intel Pro/98, Intel Pro/99, Intel Pro/00, Intel Pro/01, Intel Pro/02, Intel Pro/03, Intel Pro/04, Intel Pro/05, Intel Pro/06, Intel Pro/07, Intel Pro/08, Intel Pro/09, Intel Pro/10, Intel Pro/11, Intel Pro/12, Intel Pro/13, Intel Pro/14, Intel Pro/15, Intel Pro/16, Intel Pro/17, Intel Pro/18, Intel Pro/19, Intel Pro/20, Intel Pro/21, Intel Pro/22, Intel Pro/23, Intel Pro/24, Intel Pro/25, Intel Pro/26, Intel Pro/27, Intel Pro/28, Intel Pro/29, Intel Pro/30, Intel Pro/31, Intel Pro/32, Intel Pro/33, Intel Pro/34, Intel Pro/35, Intel Pro/36, Intel Pro/37, Intel Pro/38, Intel Pro/39, Intel Pro/40, Intel Pro/41, Intel Pro/42, Intel Pro/43, Intel Pro/44, Intel Pro/45, Intel Pro/46, Intel Pro/47, Intel Pro/48, Intel Pro/49, Intel Pro/50, Intel Pro/51, Intel Pro/52, Intel Pro/53, Intel Pro/54, Intel Pro/55, Intel Pro/56, Intel Pro/57, Intel Pro/58, Intel Pro/59, Intel Pro/60, Intel Pro/61, Intel Pro/62, Intel Pro/63, Intel Pro/64, Intel Pro/65, Intel Pro/66, Intel Pro/67, Intel Pro/68, Intel Pro/69, Intel Pro/70, Intel Pro/71, Intel Pro/72, Intel Pro/73, Intel Pro/74, Intel Pro/75, Intel Pro/76, Intel Pro/77, Intel Pro/78, Intel Pro/79, Intel Pro/80, Intel Pro/81, Intel Pro/82, Intel Pro/83, Intel Pro/84, Intel Pro/85, Intel Pro/86, Intel Pro/87, Intel Pro/88, Intel Pro/89, Intel Pro/90, Intel Pro/91, Intel Pro/92, Intel Pro/93, Intel Pro/94, Intel Pro/95, Intel Pro/96, Intel Pro/97, Intel Pro/98, Intel Pro/99, Intel Pro/00, Intel Pro/01, Intel Pro/02, Intel Pro/03, Intel Pro/04, Intel Pro/05, Intel Pro/06, Intel Pro/07, Intel Pro/08, Intel Pro/09, Intel Pro/10, Intel Pro/11, Intel Pro/12, Intel Pro/13, Intel Pro/14, Intel Pro/15, Intel Pro/16, Intel Pro/17, Intel Pro/18, Intel Pro/19, Intel Pro/20, Intel Pro/21, Intel Pro/22, Intel Pro/23, Intel Pro/24, Intel Pro/25, Intel Pro/26, Intel Pro/27, Intel Pro/28, Intel Pro/29, Intel Pro/30, Intel Pro/31, Intel Pro/32, Intel Pro/33, Intel Pro/34, Intel Pro/35, Intel Pro/36, Intel Pro/37, Intel Pro/38, Intel Pro/39, Intel Pro/40, Intel Pro/41, Intel Pro/42, Intel Pro/43, Intel Pro/44, Intel Pro/45, Intel Pro/46, Intel Pro/47, Intel Pro/48, Intel Pro/49, Intel Pro/50, Intel Pro/51, Intel Pro/52, Intel Pro/53, Intel Pro/54, Intel Pro/55, Intel Pro/56, Intel Pro/57, Intel Pro/58, Intel Pro/59, Intel Pro/60, Intel Pro/61, Intel Pro/62, Intel Pro/63, Intel Pro/64, Intel Pro/65, Intel Pro/66, Intel Pro/67, Intel Pro/68, Intel Pro/69, Intel Pro/70, Intel Pro/71, Intel Pro/72, Intel Pro/73, Intel Pro/74, Intel Pro/75, Intel Pro/76, Intel Pro/77, Intel Pro/78, Intel Pro/79, Intel Pro/80, Intel Pro/81, Intel Pro/82, Intel Pro/83, Intel Pro/84, Intel Pro/85, Intel Pro/86, Intel Pro/87, Intel Pro/88, Intel Pro/89, Intel Pro/90, Intel Pro/91, Intel Pro/92, Intel Pro/93, Intel Pro/94, Intel Pro/95, Intel Pro/96, Intel Pro/97, Intel Pro/98, Intel Pro/99, Intel Pro/00, Intel Pro/01, Intel Pro/02, Intel Pro/03, Intel Pro/04, Intel Pro/05, Intel Pro/06, Intel Pro/07, Intel Pro/08, Intel Pro/09, Intel Pro/10, Intel Pro/11, Intel Pro/12, Intel Pro/13, Intel Pro/14, Intel Pro/15, Intel Pro/16, Intel Pro/17, Intel Pro/18, Intel Pro/19, Intel Pro/20, Intel Pro/21, Intel Pro/22, Intel Pro/23, Intel Pro/24, Intel Pro/25, Intel Pro/26, Intel Pro/27, Intel Pro/28, Intel Pro/29, Intel Pro/30, Intel Pro/31, Intel Pro/32, Intel Pro/33, Intel Pro/34, Intel Pro/35,



revolution in evolution

Highlights from the Journey to 1 Billion PCs

1,000,000,000
900,000,000
800,000,000
700,000,000
600,000,000
500,000,000
400,000,000
300,000,000
200,000,000
100,000,000



1971 – Intel, founded by Robert Noyce, Gordon Moore and Andy Grove, introduces the world's first microprocessor and calls it the Intel® 4004.



1974 – Intel introduces the 8008 microprocessor, which was used in the first commercially successful personal computer – the Altair.



1976 – Apple Computer, Inc. releases the Apple I, the first single circuit board computer.¹ The following year, the company introduces the Apple II. A first for a personal computer, the Apple II featured colored graphics.¹



1981 – IBM introduces its first personal computer featuring the Intel® 8088 microprocessor. It sparked the PC revolution and set industry standards that still exist today. The IBM platform enabled hardware makers and software programmers to develop programs and add-on accessories. Until then, most PCs had been closed and proprietary.



1982 – Lotus Development Corporation introduces Lotus 1-2-3, which becomes a best-seller application.¹



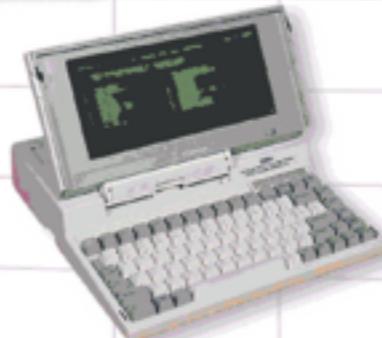
1983 – The IBM PC/XT establishes the IBM format PC featuring an Intel processor, Microsoft DOS and a hard drive as the most popular personal computing platform.



1984 – Apple introduces the Macintosh with a GUI. A GUI is a graphical user interface that provides visual representation for what was previously lines of DOS code, making PCs more usable for non-technical people.



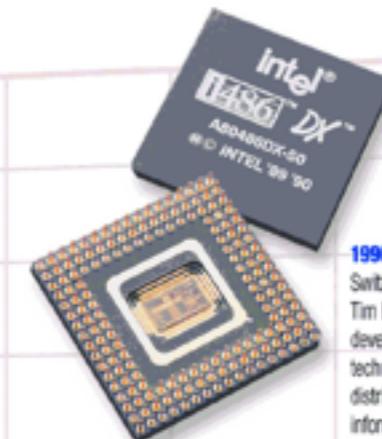
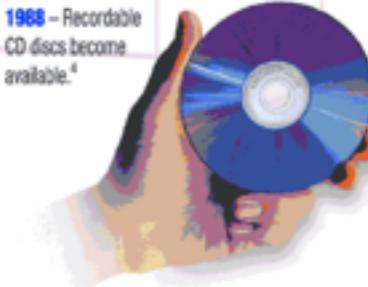
1985 – Intel introduces the 386™ microprocessor featuring 275,000 transistors – more than 100 times as many as the original 4004. The 386™ microprocessor was a 32-bit chip that brought "multi-tasking" capabilities to the PC.



1986 – Microsoft ships the Windows® operating system with a graphical user interface. America Online is founded.²

1987 – Toshiba introduces the T1000 laptop PC, making portable computing more widely available.

1988 – Recordable CD discs become available.⁴



1990 – In Geneva, Switzerland, Tim Berners-Lee develops a new technique for distributing information on the Internet, eventually called the World Wide Web.



Leading PC manufacturers begin to introduce laptops equipped with Microsoft Windows® and the Intel® 386SL™ — the first processor designed specifically for a mobile computer.



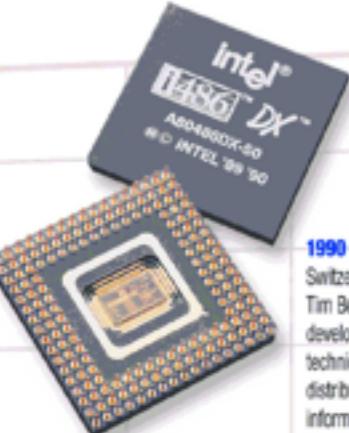
1991

1991 – Creative Labs introduces a Multimedia Upgrade Kit containing a CD-ROM drive, Sound Blaster® Pro board, speakers and multimedia software.

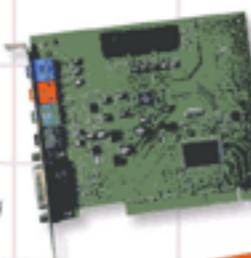


2007-2008 – The number of PCs shipped worldwide may reach 2 billion, according to industry analyst firm Gartner Dataquest.²

illion PCs



1989 – The number of PCs shipped worldwide reaches nearly 120 million.²



1991 – Creative Labs introduces a Multimedia Upgrade Kit containing a CD-ROM drive, Sound Blaster[®] Pro board, speakers and multimedia software.



³ – Recordable discs become available.⁴



1990 – In Geneva, Switzerland, Tim Berners-Lee develops a new technique for distributing information on the Internet, eventually called the World Wide Web.



Leading PC manufacturers begin to introduce laptops equipped with Microsoft Windows[®] and the Intel[®] 386SL[™] – the first processor designed specifically for a mobile computer.



1993 – Intel introduces the Pentium[®] processor and Microsoft introduces Windows[®] 3.1, providing a solid multimedia platform for consumer games and learning applications.

Increased processing capabilities, coupled with the availability of affordable CD-ROM drives and sound cards, usher in multimedia on the PC.

Marc Andreessen creates an Internet browser called Netscape.⁵

PC gaming comes of age when id Software[®] unleashes DOOM, one of the most popular PC games ever.

DOOM also introduced multiplayer gaming to the masses, allowing players to compete in intense 4-player LAN or head-to-head modem competitions.⁶

1994 – The number of PCs shipped worldwide reaches nearly 288 million.²

The number of PCs shipped worldwide reaches more than 347 million.²

1996 – The Digital Versatile Disc (DVD) debuts at the Consumer Electronics Show.⁷

Fujitsu introduces the technology into the FMV Deskpower series, powered by the Pentium[®] processor.⁸

1997 – Intel introduces the Pentium[®] II processor and the number of PCs shipped worldwide reaches more than 497 million.²

Approximately 40 million people are connected to the Internet and more than 1 billion dollars change hands online.⁹

than 250 million businesses, homes, and schools around the world.⁶

1998 – Diamond Multimedia Systems, Inc. pioneers portable MP3 digital music technology with the launch of the Rio PMP 300.

The number of PCs shipped worldwide reaches 590 million.²

The number of PCs shipped worldwide is nearly 706 million.²

1999 – Napster is founded and users share digital music online.¹⁰

Intel introduces the Pentium[®] III processor. Americans are sending 2.2 billion e-mail messages a day, compared with just 293 million pieces of first-class mail.¹¹

2000 – Intel introduces the Pentium[®] 4 processor and an estimated 400 million people worldwide are connected to the Internet by the end of the year – more than double the number of people connected in September 1999.¹²

The number of PCs shipped worldwide reaches 961 million.²

2001 – 20th anniversary of IBM's first personal computer; Microsoft introduces the Windows[®] XP operating system; Nearly half a billion people around the world have access to the Internet from their homes.¹³

The number of PCs shipped worldwide reaches 1 billion PC, according to industry analyst firm Gartner Dataquest.²



2002 – Intel introduces the Mobile Intel[®] Pentium[®] 4 Processor-M, bringing desktop performance to the laptop PC.

The PC industry ships the 1 billionth PC, according to industry analyst firm Gartner Dataquest.²

2003 – The number of PCs shipped worldwide reaches 1.1 billion.²

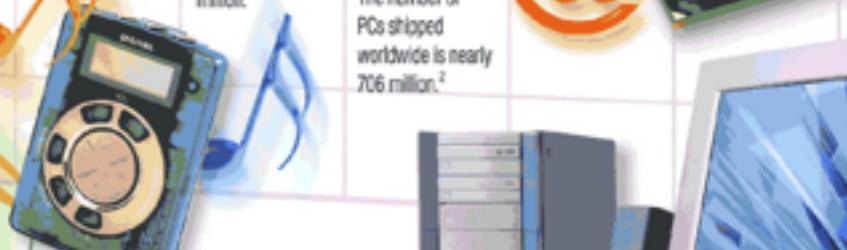
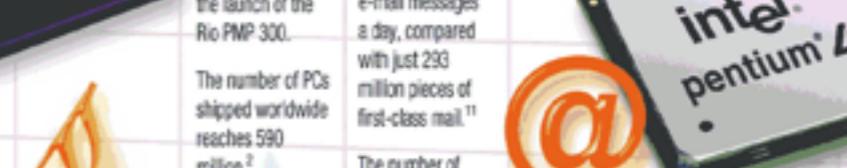
2004 – The number of PCs shipped worldwide reaches 1.2 billion.²

2005 – The number of PCs shipped worldwide reaches 1.3 billion.²

2006 – The number of PCs shipped worldwide reaches 1.4 billion.²

2007 – The number of PCs shipped worldwide reaches 1.5 billion.²

2008 – The number of PCs shipped worldwide reaches 1.6 billion.²



2007-2008 – The number of PCs shipped worldwide may reach 2 billion, according to industry analyst firm Gartner Dataquest.²

2008

1,000,000,000

900,000,000

800,000,000

700,000,000

600,000,000

500,000,000

400,000,000

300,000,000

200,000,000

100,000,000

Components of Multimedia System

Components (Hardware and Software) required for a multimedia system:

- **Capture devices** — Video Camera, Video Recorder, Audio Microphone, Keyboards, Mouse, graphics tablets, 3D input devices, tactile sensors, VR devices, Digitising Hardware



3D

3D Input Device

- **Storage Devices** — Hard disks, CD-ROMs, DVD-ROM, etc
- **Communication Networks** — Local Networks, Intranets, Internet, Multimedia or other special high speed networks.
- **Multimedia Authoring** and software tool-to create the multimedia application and to create or edit the medium

- **Computer Systems** — Multimedia Desktop machines, Workstations, MPEG/VIDEO/DSP Hardware
- **Display Devices** — CD-quality speakers, HDTV, SVGA (Super Video Graphics Array), Hi-Res monitors, Colour printers etc.



Multimedia System Categories

- **Linear** active content progresses without any navigational control for the viewer such as a cinema presentation.
- **Non-linear** content offers user interactivity to control progress as used with a computer game or used in self-paced computer based training.

Linear	Non Linear
Not interactive	Interactive
No Navigation Control	Navigation Control
One way interaction	Offer user interactivity to control progress
Cinema presentation	Website

Field of Application

- Advertisements
- Art
- Education
- Entertainment
- Engineering
- Medicine
- Mathematics
- Business
- And many more

Applications of Multimedia

- **Business** – presentations, training, marketing, advertising, product demos, databases, catalogues, instant messaging and networked communication.
- **Schools** - Educational software can be developed to enrich the learning process.
- **Home** - via television sets or monitors with built-in user inputs.
- **Public places** - stand-alone terminals or kiosks to provide information and help.

Applications of Multimedia

- World Wide Web
- Video conferencing
- Video-on-demand
- Interactive TV
- Digital Transmission
- Groupware
- Webcasting
- Home shopping
- Games
- Virtual reality
- Digital video editing and production systems

What are the functions of
multimedia in
corporation?

Multimedia in Corporation

Corporate Functions	MM Applications
Communications	<ul style="list-style-type: none">- Corporate Broadcasting- Executive Info. Systems- Multimedia Conferencing- Employee Info. Systems
Training	<ul style="list-style-type: none">- Corporate Training- Sales Training- Just-in-Time Training- Distant Training

Multimedia Corporation

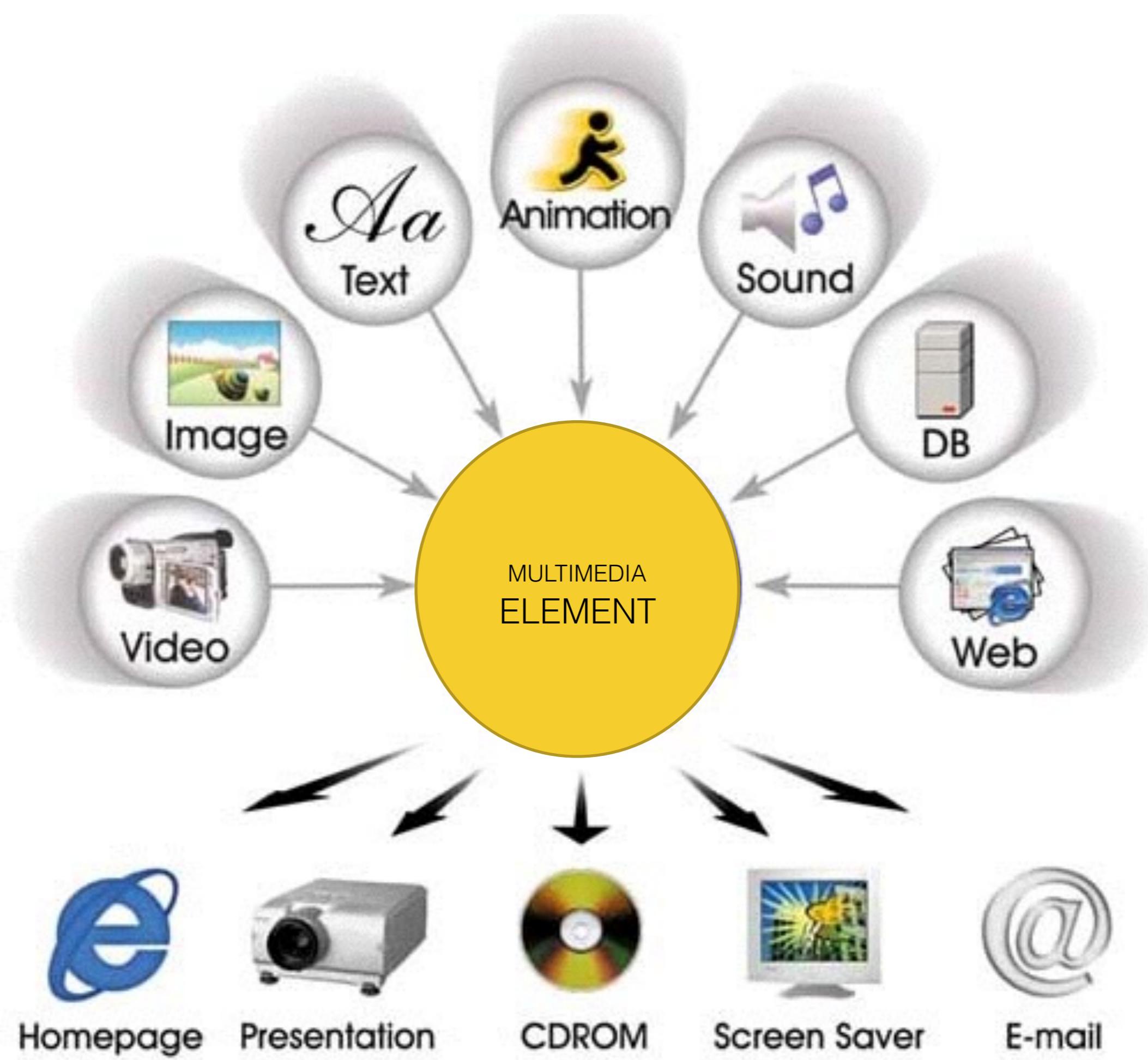
Corporate Functions	MM Applications
Marketing	<ul style="list-style-type: none">- Design of TV Commercials- Interactive Advertising- Product Information Kiosks- Promotional Presentations- Customer Services- Virtual Reality Simulations
Sales	<ul style="list-style-type: none">- Product Catalogs- Portable MM Presentations- Merchandising Kiosks

Multimedia in Corporation

Corporate Functions	MM Applications
Product Development	<ul style="list-style-type: none">- Reference Systems- Simulations- Product Visualizations- Design Advisors
Manufacturing	<ul style="list-style-type: none">- Diagnostics- Equipment Maintenance- Testing Procedures

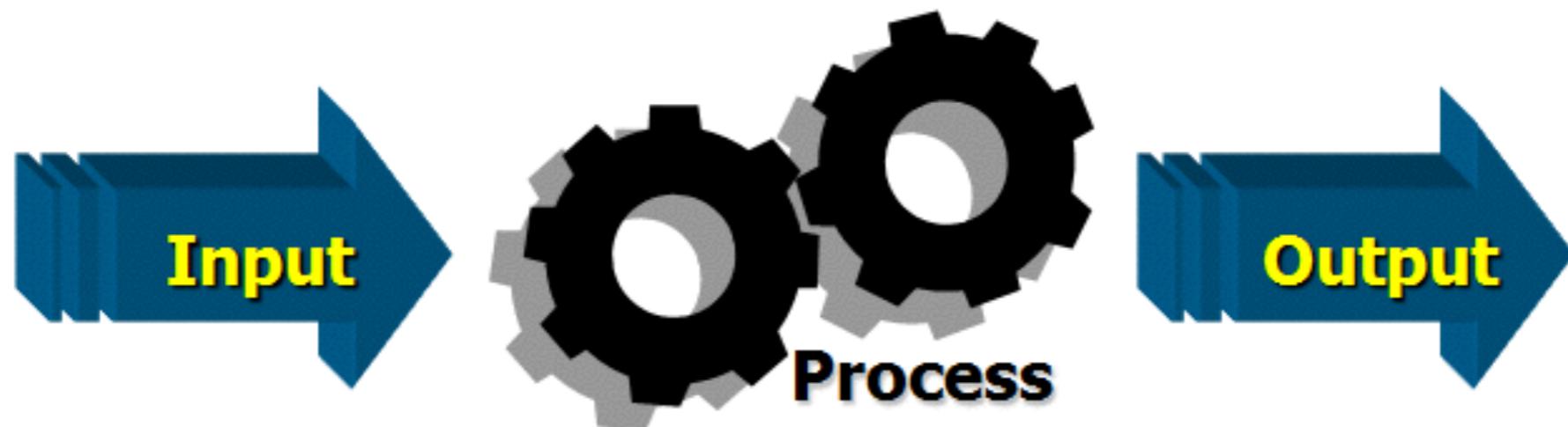
Multimedia in Corporation

Corporate Functions	MM Applications
Administration	<ul style="list-style-type: none">- Multimedia File-Sharing- Multimedia Databases- Document Imaging- Productivity Systems- Decision Support Systems
Home	<ul style="list-style-type: none">- Home Networking- Home Shopping- Home Banking



Multimedia Project Design

Multimedia Development



Capture from device

Read from a file

Receive over the network

Apply effect filters and transforms

Compress or decompress

Convert between formats

Present

Save to a file

Send across the network



Develop workflow methods

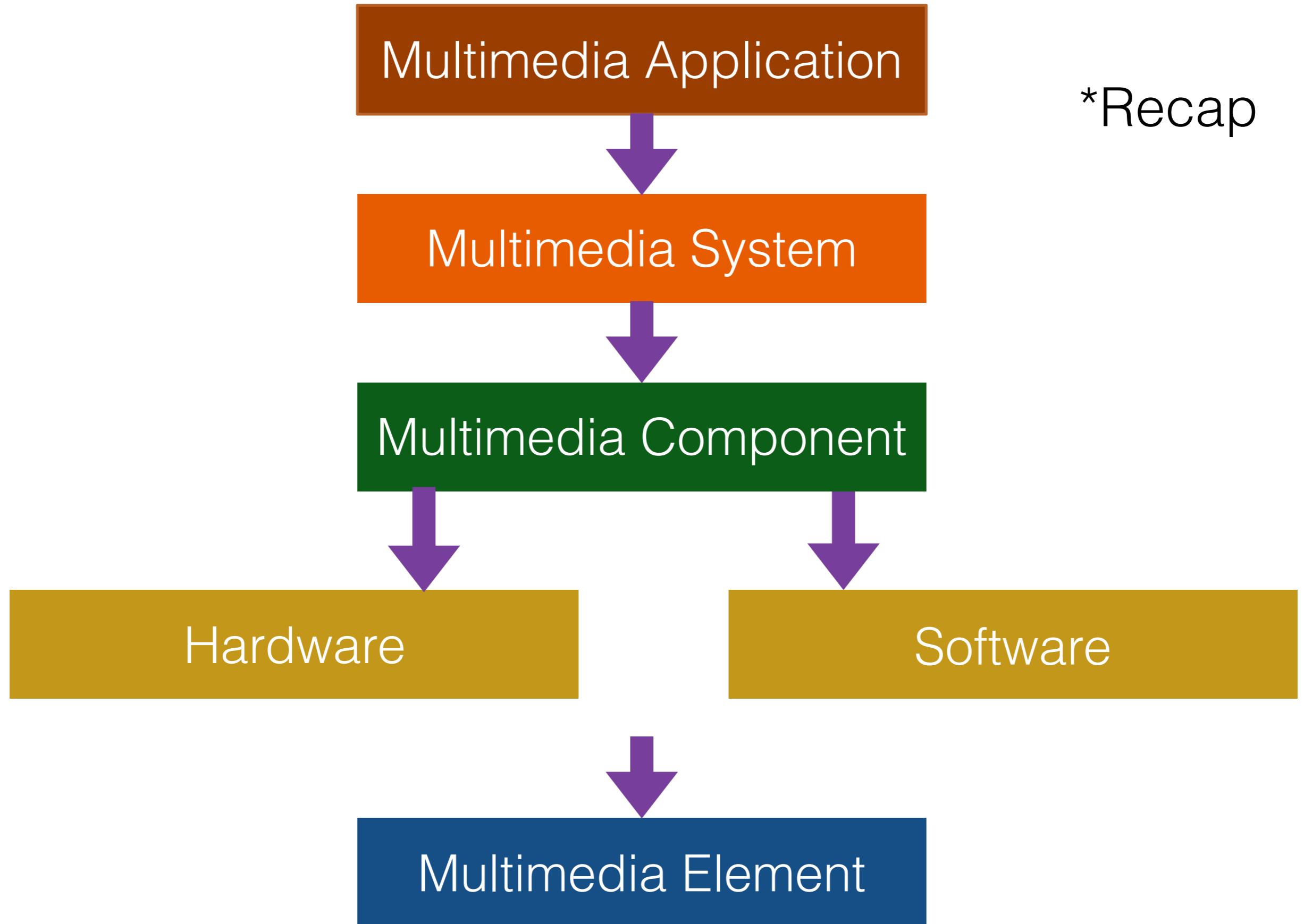
- **Buy high, sell low**
 - Digitize images, sound, video at highest possible resolution & reduce it later
 - Digitizing at low resolution saves memory & storage up front, but loses too much data
- **Save the best for last**
 - Reduce the resolution of the content last, after you've done your editing and altering
 - Compress from the high quality version – otherwise the file degrades rapidly if you recompress previously compressed documents

Key features of multimedia application

Beautiful and full of knowledge

Creative and resourceful

*Recap



Examples: Designing HTML5 Web Content

What is the qualification of the multimedia on the web?

- Graphics
 - Backgrounds
 - Pictures
 - 3-D graphics
 - Charts
 - Computer-generated graphics, drawings, etc.
 - Clip art
 - Buttons
- Text
 - Animation
 - Morphing
 - Sound
 - Narration, voice
 - Recorded music or special sounds
 - Computer-generated music
- Video

What are the challenges to design multimedia for different type of web-browsers?

Multimedia for the web differs

- Size constraints for client download
- Viewers' workstations differ
 - Size of screen
 - Modem speed
 - Colors pallets
 - Video cards
 - Browsers, plugins
- Design for the worst case? Or warn viewers?
Or both?

Product performance

- ✖ The customers' screens have to reproduce everything you produce in your program
- ✖ No matter what computer, monitor, connection they are using.
- ✖ The law of digital media:
 - + High quality images and sound
 - + Ability to run on most computers
 - + Acceptable performance

COMPRESSION

Compression

- There are two types of File compression algorithms:
 - Lossless
 - Lossy
- It can be applied in any types of multimedia data such as text, image, audio and video
- Compression always related to the extension name of multimedia file types. E.g. .jpg for JPEG and JPEG2000 types of image compression.

Data compression

- Data compression requires the identification and extraction of source redundancy.
- In other words, data compression seeks to reduce the number of bits used to store or transmit information.

Lossless compression

- Lossless compression can recover the exact original data after compression.
- It is used mainly for compressing database records, spreadsheets or word processing files, where exact replication of the original is essential.

Lossy compression

- Lossy compression will result in a certain loss of accuracy in exchange for a substantial increase in compression.
- More effective when used to compress graphic images and digitized voice where losses outside visual or aural perception can be tolerated.
- Most techniques can be adjusted to different quality levels, gaining higher accuracy in exchange for less effective compression.

Data compression

- **Storage space** and also the time taken to **locate** and **retrieve information** when required.
- **Bandwidth of a digital communication link** can be effectively increased by **compressing data** at the **sending end** and **decompressing** data at the **receiving end**.
- **Improvements of data throughput** can be achieved.
- Many files can be **combined** into one **compressed document** making sending easier.

Image Compression

- Image compression is minimizing the size in bytes of a graphics file without degrading the quality of the image to an unacceptable level.
- The reduction in file size allows more images to be stored in a given amount of disk or memory space. It also reduces the time required for images to be sent over the Internet or downloaded from Web pages.

Audio Compression

- Audio compression is a form of data compression designed to reduce the transmission bandwidth requirement of digital audio streams and the storage size of audio files.
- Audio compression algorithms are implemented in computer software as audio codecs.

Video Compression

- Video compression refers to reducing the quantity of data used to represent digital video images, and is a combination of spatial image compression and temporal motion compensation.
- Most video compression is lossy — it operates on the premise that much of the data present before compression is not necessary for achieving good perceptual quality.

Multimedia File Formats

ACT	PSD	PDF	AI	EPS	PC
XR	JOINT PHOTOGRAPHIC (EXPERTS) GROUP JPG SCREEN .JPG	GRAPHICS INTERFACE FORMAT GIF SCREEN .GIF	PORTABLE NETWORK GRAPHICS PNG SCREEN .PNG	TAGGED IMAGE FILE FORMAT TIFF PRINT .TIFF	TG
SB	TGA	IFF	RAW	SVG	DC

Image File Formats

- **Image file formats** are standardized means of organizing and storing digital images.
- Image files are composed of either pixel or vector (geometric) data that are rasterized to pixels when displayed (with few exceptions) in a vector graphic display.

Image File Formats

- JPEG/JFIF
- JPEG 2000
- Exif
- TIFF
- RAW
- PNG
- GIF
- BMP
- PPM, PGM, PBM, PNM
- WEBP
- Others

JPEG (Joint Photographic Experts Group)

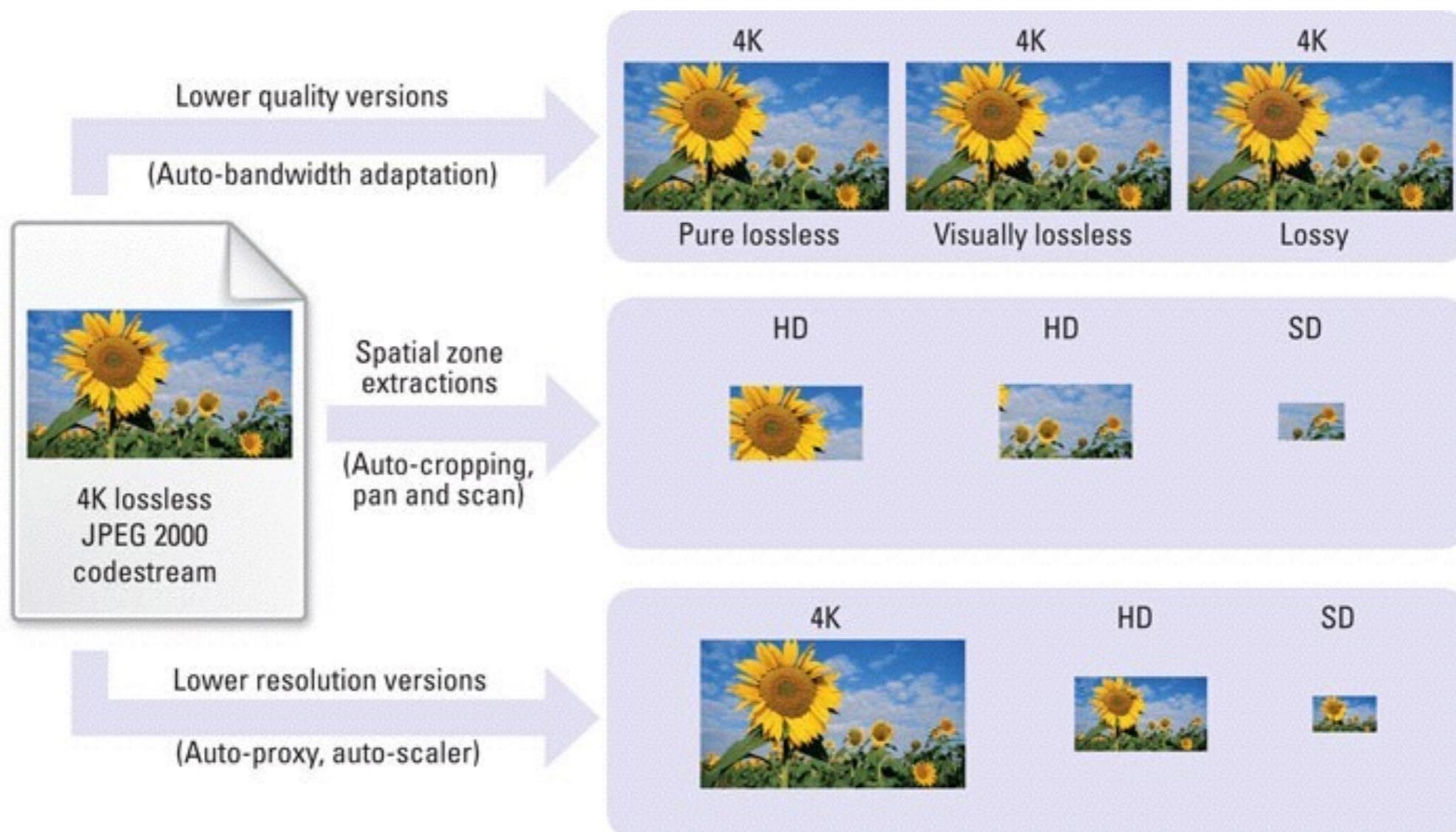
- is a compression method;
- JPEG-compressed images are usually stored in the JFIF (JPEG File Interchange Format) file format. JPEG compression is (in most cases) lossy compression.
- Filename extension is -- . JPG or . JPEG.
- Nearly every digital camera can save images in the JPEG/JFIF format, which supports 8 bits per color (red, green, blue) for a 24-bit total, producing relatively small files.
- The JPEG/JFIF format also is used as the image compression algorithm in many PDF files.

JPEG 2000

- JPEG 2000 is a compression standard enabling both lossless and lossy storage. The compression methods used are different from the ones in standard JFIF/JPEG; they improve quality and compression ratios, but also require more computational power to process.
- JPEG 2000 also adds features that are missing in JPEG. It is not nearly as common as JPEG, but it is used currently in professional movie editing and distribution (e.g., some digital cinemas use JPEG 2000 for individual movie frames).

JPEG 2000 highlight

- Multiple resolution representation
- Progressive transmission by pixel and resolution accuracy



EXIF

- The Exif (Exchangeable Image File format) format is a file standard similar to the JPEG/JFIF format with .TIFF extensions; it is incorporated in the JPEG-writing software used in most cameras. Its purpose is to record and to standardize the exchange of images with image metadata between digital cameras and editing and viewing software.
- The metadata are recorded for individual images and include such things as camera settings, time and date, shutter speed, exposure, image size, compression, name of camera, color information, etc.
- When images are viewed or edited by image editing software, all of this image information can be displayed.

TIFF

- The TIFF (**T**agged **I**mage **F**ile **F**ormat) format is a flexible format that normally saves 8 bits or 16 bits per color (red, green, blue) for 24-bit and 48-bit totals,
- TIFFs can be lossy and lossless;
- Some digital cameras can save in TIFF format, using the LZW compression algorithm for lossless storage.
- TIFF image format is not widely supported by web browsers.
- TIFF remains widely accepted as a photograph file standard in the printing business.

RAW

- RAW refers to a family of raw image formats that are options available on some digital cameras.
- These formats usually use a lossless or nearly-lossless compression,
- Raw image files are sometimes called **digital negatives**
- Likewise, the process of converting a raw image file into a viewable format is sometimes called developing a raw image
- The purpose of raw image formats is to save, with minimum loss of information, data obtained from the sensor, and the conditions surrounding the capturing of the image (the metadata).

PNG (Portable Network Graphics)

- The PNG (Portable Network Graphics) file format was created as the free, open-source successor to the GIF.
- The PNG file format supports truecolor (16 million colors) while the GIF supports only 256 colors.
- The PNG file excels when the image has large, uniformly colored areas.
- The lossless PNG format is best suited for editing pictures, and the lossy formats, like JPG, are best for the final distribution of photographic images,
- JPG files are usually smaller than PNG files.
- Animated formats derived from PNG are MNG and APNG. The latter is supported by Mozilla Firefox and Opera and is backwards compatible with PNG.

GIF(Graphics Interchange Format)

- GIF is limited to an 8-bit palette, or 256 colors.
- GIF format suitable for storing graphics with relatively few colors such as simple diagrams, shapes, logos and cartoon style images.
- The GIF format supports animation and is still widely used to provide image animation effects.
- It also uses a lossless compression that is more effective when large areas have a single color, and ineffective for detailed images or dithered images.

BMP (Bitmap Image File)

- The BMP file format (Windows bitmap) handles graphics files within the Microsoft Windows OS.
- Typically, BMP files are uncompressed, hence they are large; the advantage is their simplicity and wide acceptance in Windows programs.
- also known as Device Independent Bitmap (DIB) file format or simply a Bitmap,
- is a Raster graphics image file format used to store bitmap digital images, independently of the display device
- The BMP File Format is capable of storing 2D digital images

WEBP

- WebP (pronounced "*weppy*") is a new image format that uses lossy compression.
- Images and photos make up about 65% of the bytes transmitted per web page today.
- It was designed by Google to reduce image file size to speed up web page loading:
- its principal purpose is to supersede JPEG as the primary format for photographs on the web.
- WebP, that promises to significantly reduce the byte size of photos on the web, allowing web sites to load faster than before.

Others

Other image file formats of raster type include:

- • JPEG XR (New JPEG standard based on Microsoft HD Photo)
- • TGA (TARGA)
- • ILBM (InterLeaved BitMap)
- • PCX (Personal Computer eXchange)
- • ECW (Enhanced Compression Wavelet)
- • IMG (ERDAS IMAGINE Image)
- • SID (multiresolution seamless image database, MrSID)
- • CD5 (Chasys Draw Image)

- FITS (Flexible Image Transport System)
- • PGF (Progressive Graphics File)
- • XCF (eXperimental Computing Facility format,
native GIMP format)
- • PSD (Adobe PhotoShop Document)
- • PSP (Corel Paint Shop Pro)

Audio File Formats

- An **audio file format** is a file format for storing audio data on a computer system.
- It can be a raw bitstream, but it is usually a container format or an audio data format with defined storage layer.
- The general approach towards storing digital audio is to sample the audio voltage which, on playback, would correspond to a certain level of signal in an individual channel with a certain resolution—the number of bits per sample—in regular intervals (forming the sample rate).

Audio File Formats

- Waveform Audio File Format
- MP3
- Au file format
- Windows Media Audio (WMA)
- RealAudio
- The Adaptive Multi-Rate (AMR or AMR-NB)
- Advanced Audio Coding (AAC)
- MPEG-4 Part 14 or MP4 file format
- Red Book is the standard for audio CDs

Waveform Audio File Format

- Waveform Audio File Format (WAVE, or WAV) is a Microsoft and IBM audio file format standard for storing an audio bitstream on PCs.
- It is the main format used on Windows systems for raw and typically uncompressed audio.
- Uncompressed WAV files are quite large, so, WAV files as file sharing over the Internet has declined in popularity.
- However, it is still a commonly used file type, suitable for retaining "first generation" archived files of high quality, for use on a system where disk space is not a constraint, or in applications such as audio editing, where the time involved in compressing and uncompressing data is a concern.

MP3

- MP3 is an audio-specific format that was designed by the Moving Picture Experts Group(MPEG) as part of its MPEG-1 standard and later extended in MPEG-2 standard.
- The use in MP3 of a lossy compression algorithm is designed to greatly reduce the amount of data required to represent the audio recording
- An MP3 file that is created using the setting of 128 kbit/s will result in a file that is about 11 times smallerthan the CD file created from the original audio source.
- An MP3 file can also be constructed at higher or lower bit rates, with higher or lower resulting quality.

Windows Media Audio (WMA)

- Windows Media Audio(WMA) is an audio data compression technology developed by Microsoft.
- It is a proprietary technology that forms part of the Windows Media framework.
- WMA consists of four distinct codecs.
 - The original WMA codec, known simply as WMA, was conceived as a competitor to the popular MP3 and RealAudio codecs.
 - WMA Pro, a newer and more advanced codec, supports multichannel and high resolution audio.
 - WMA Lossless, compresses audio data without loss of audio fidelity (the regular WMA format is not lossless).
 - And WMA Voice, targeted at voice content, applies compression using a range of low bit rates.[3]



RealAudio



- Real Audio is a proprietary audio format developed by RealNetworks and first released in 1995.
- It can also be used as a streaming audio format, that is played at the same time as it is downloaded.
- In the past, many internet radio stations used RealAudio to stream their programming over the internet in real time.
- In recent years, however, the format has become less common and has given way to more popular audio formats.



- RealAudio was heavily used by the BBC websites until 2009.
- RealAudio files were originally identified by a filename extension of **.ra** (for Real Audio).
- In 1997, RealNetworks also began offering a video format called RealVideo. The combination of the audio and video formats was called RealMedia and used the file extension **.rm**.

The Adaptive Multi-Rate (AMR or AMR-NB)

- The Adaptive Multi-Rate (AMR or AMR-NB) audio codec is a patented audio data compression scheme optimized for speech coding.
- AMR was adopted as the standard speech codec by 3GPP in October 1998 and is now widely used in GSM and UMTS.
- AMR is also a file format for storing spoken audio using the AMR codec.
- Many modern mobile telephone handsets can store short audio recordings in the AMR format.
- Both free and proprietary programs exist to convert between AMR and other formats, although it should be remembered that AMR is a speech format and is unlikely to give ideal results for other audio.
- The common filename extension is .amr.

Advanced Audio Coding (AAC)

- Advanced Audio Coding (AAC) is a standardized, lossy compression and encoding scheme for digital audio.
- Designed to be the successor of the MP3 format.
- AAC generally achieves better sound quality than MP3 at similar bit rates.
- AAC is also the default or standard audio format for iPhone, iPod, iPad, Nintendo DSi, iTunes, DivX Plus Web Player and PlayStation 3,Wii, Sony Walkman MP3 series and later, mobile phones made by Sony Ericsson and Nokia and Android-based mobile phones.

MPEG-4 Part 14 or MP4 file format

- MPEG-4 formally ISO/IEC 14496-14:2003
- It is a multimedia container format standard specified as a part of MPEG-4.
- It is most commonly used to store digital video and digital audio streams, especially those defined by MPEG, but can also be used to store other data such as subtitles and still images.
- MPEG-4 Part 14 allows streaming over the Internet.
- A separate hint track is used to include streaming information in the file.
- The official filename extension for MPEG-4 Part 14 files is .mp4, thus the container format is often referred to simply as MP4.

Red Book (CD standard)

- Red Book is the standard for audio CDs (Compact Disc Digital Audio system, CDDA or CD-DA). It is named after one of the Rainbow Books, a series of books (bound in different colors) that contain the technical specifications for all CD and CD-ROM formats.
- The first edition of the Red Book was released in 1980 by Philips and Sony,
- It was adopted by the Digital Audio Disc Committee and ratified as IEC 60908. The standard is not freely available and must be licensed from Philips.

Video File Formats

The Video Files category includes a wide range of video formats, which use different codecs to encode and compress video data.



- The AVI Format
- The Windows Media Format
- Advances Streaming Format (.ASF)
- Data File
- The MPEG Format
 - MPEG-1
 - MPEG-2
 - MPEG-3
 - MPEG-4

- The Quick Time Format
- The Real Video Format
- The Shockwave Format
- Flash Video Format (.flv)
- The Matroska Multimedia Container (MKV)
- 3GPP Multimedia File

The AVI Format

- The AVI (Audio Video Interleave) format was developed by Microsoft.
- The AVI format is supported by all computers running Windows, and by all the most popular web browsers.
- It is a very common format on the Internet, but not always possible to play on non-Windows computers.
- Videos stored in the AVI format have the extension .avi.

The Windows Media Format

- Windows Media Video(WMV) is a video compression format for several proprietary codecs developed by Microsoft.
- The original video format, known as WMV, was originally designed for Internet streaming applications, as a competitor to RealVideo.
- The other formats, such as WMV Screen and WMV Image, cater for specialized content.
- Videos stored in this format have the extension .wmv
- A WMV file is in most circumstances encapsulated in the Advanced Systems Format (ASF) container format.

Advances Streaming Format (.ASF)

- ASF is a subset of the wmv format.
- Developed by Microsoft.
- It is intended for streaming and is used to support playback from digital media and HTTP servers, and to support storage devices such as hard disks.
- It can be compressed using a variety of video codecs.
- The file extension is .ASF

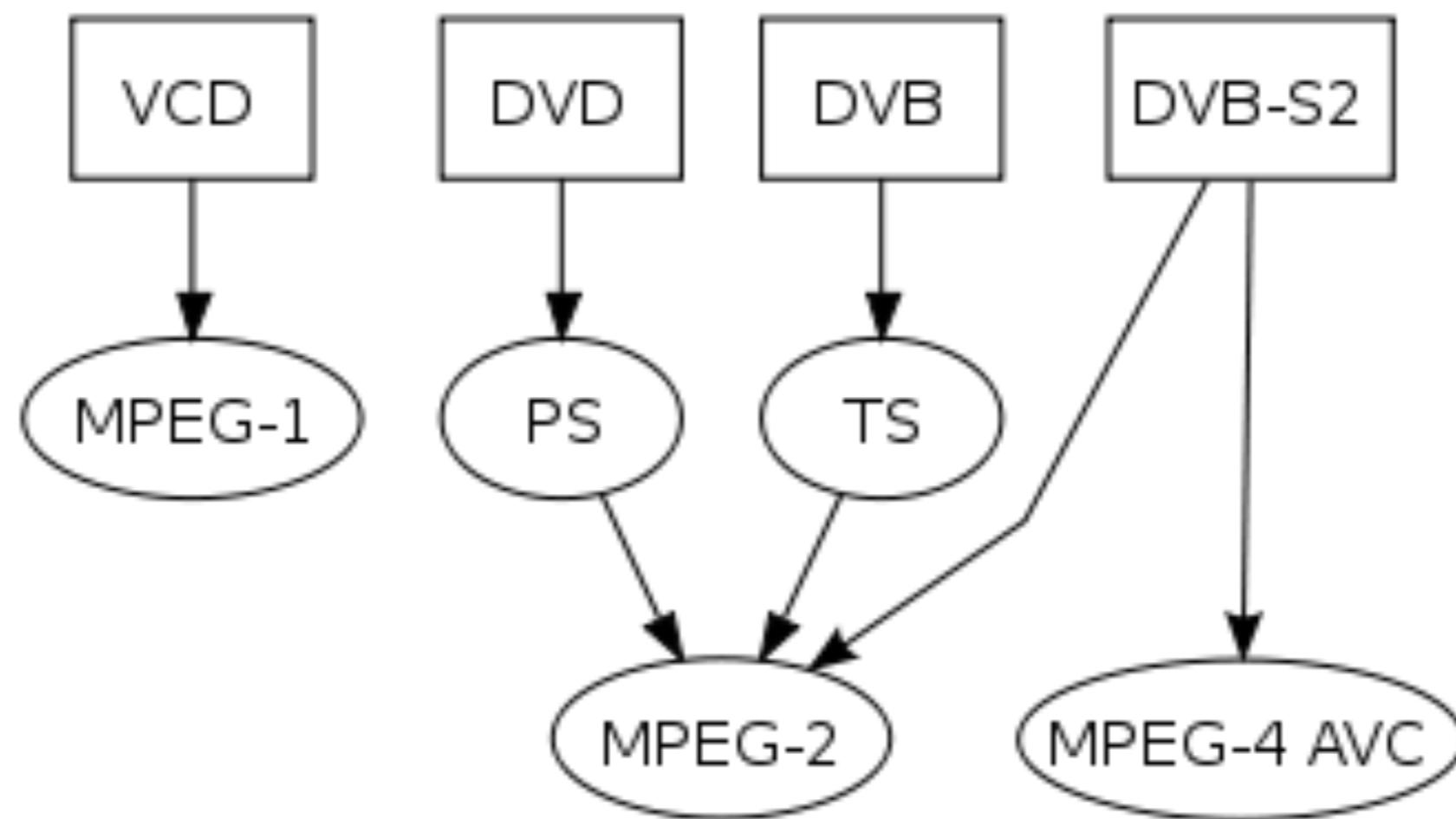
Data File(.DAT)

- The DAT file type is primarily associated with 'Data'.
- Can be just about anything: text, graphic, or general binary data.
- There is no specific structure for a .DAT file.
- You can use an editor like EditPad Pro to look inside a .DAT file and possibly determine its contents and relationship with a program.
- .DAT files are Generic data file created by a specific application;
- Typically accessed only by the application that created the file; may contain data in text or binary format; text-based DAT files can be viewed in a text editor.

The MPEG Format

- The '***Moving Picture Experts Group***' (MPEG) is a working group of experts that was formed by ISO and IEC to set standards for audio and video compression and transmission.
- The MPEG (Moving Pictures Expert Group) format is the most popular format on the Internet.
- It is cross-platform, and supported by all the most popular web browsers.
- Videos stored in the MPEG format have the extension .mpg or .mpeg.

- The MPEG standards consist of different *Parts*. Each *part* covers a certain aspect of the whole specification



MPEG-1 (1993)

- Coding of moving pictures and associated audio for digital storage media at up to about 1.5 Mbit/s (ISO/IEC 11172).
- The first MPEG compression standard for audio and video.
- It was basically designed to allow moving pictures and sound to be encoded into the bitrate of a Compact Disc.
- It is used on Video CD, SVCD and can be used for low-quality video on DVD Video.
- It was used in digital satellite/cable TV services before MPEG-2 became widespread. To meet the low bit requirement

MPEG-2 (1995)

- Generic coding of moving pictures and associated audio information. (ISO/IEC 13818) Transport, video and audio standards for broadcast-quality television.
- MPEG-2 standard was considerably broader in scope and of wider appeal – supporting interlacing and high definition.
- MPEG-2 is considered important because it has been chosen as the compression scheme for over-the-air digital television ATSC, DVB and ISDB, digital satellite TV services like Dish Network, digital cable television signals, SVCD and DVD Video.

MPEG-3

- MPEG-3 dealt with standardizing scalable and multi-resolution compression
- It was intended for HDTV compression but was found to be redundant and was merged with MPEG-2, as a result there is no MPEG-3 standard.

MPEG-4 (1998)

- Coding of audio-visual objects. (ISO/IEC 14496) MPEG-4 uses further coding tools with additional complexity to achieve higher compression factors than MPEG-2.
- In addition to more efficient coding of video, MPEG-4 moves closer to computer graphics applications.
- MPEG-4 supports Intellectual Property Management and Protection (IPMP), which provides the facility to use proprietary technologies to manage and protect content like digital rights management.
- It also supports MPEG-J, a fully programmatic solution for creation of custom interactive multimedia applications (Java application environment with a Java API) and many other features

The QuickTime Format

- The QuickTime format is developed by Apple.
- QuickTime is a common format on the Internet, but QuickTime movies cannot be played on a Windows computer without an extra (free) component installed.
- Videos stored in the QuickTime format have the extension .mov.

The RealVideo Format

- The RealVideo format was developed for the Internet by Real Media.
- The format allows streaming of video (on-line video, Internet TV) with low bandwidths.
- Because of the low bandwidth priority, quality is often reduced.
- Videos stored in the RealVideo format have the extension .rm or .ram.

The Shockwave Format

- The Shockwave format was developed by Macromedia.
- The Shockwave format requires an extra component to play.
- This component comes preinstalled with the latest versions of Netscape and Internet Explorer.
- Videos stored in the Shockwave format have the extension .swf.

Flash Video Format (.flv)

- Because of the cross-platform availability of Flash video players, the Flash video format has become increasingly popular.
- Flash video is playable within Flash movies files, which are supported by practically every browser on every platform.
- Flash video is compact, using compression from On2, and supports both progressive and streaming downloads.

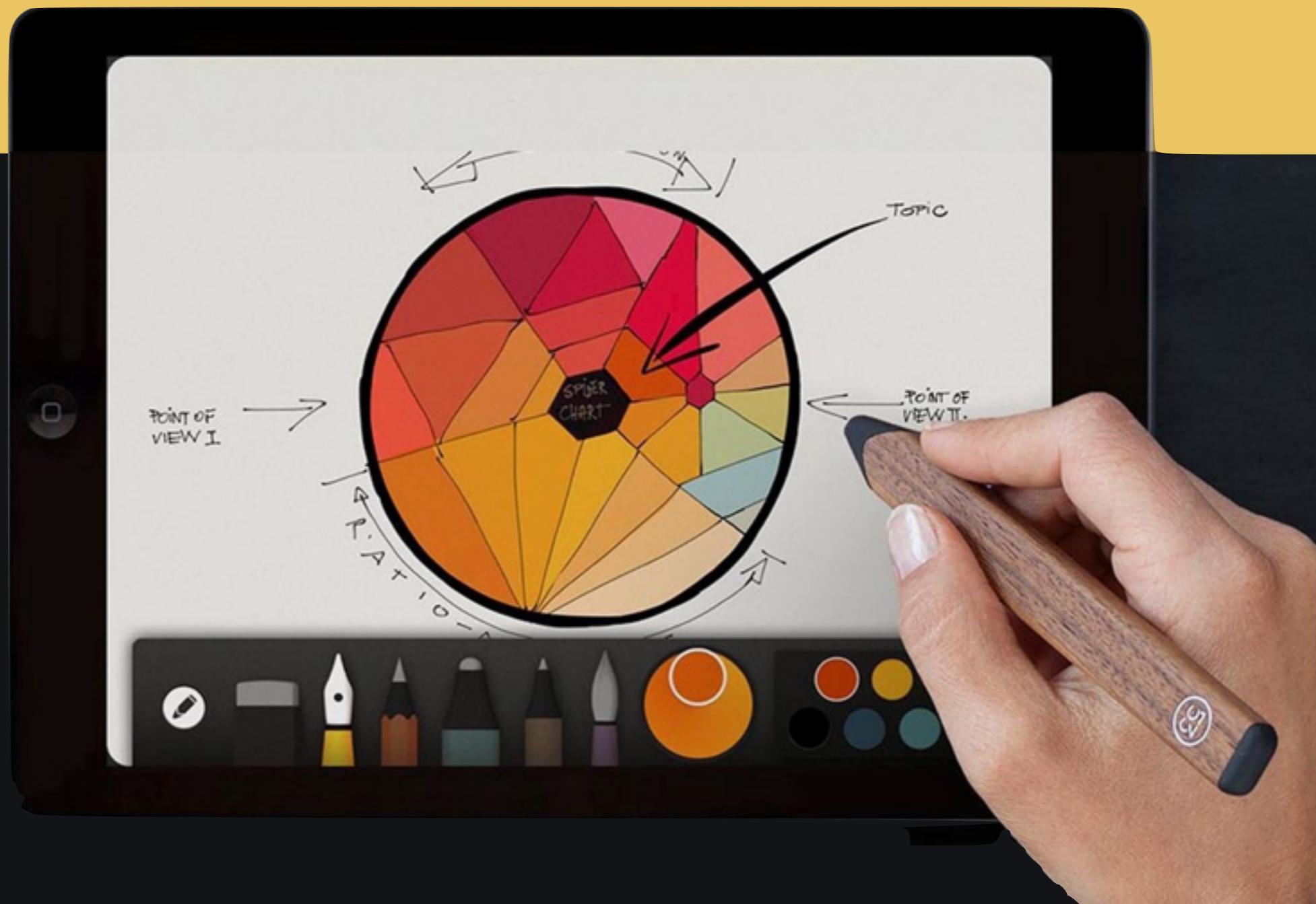
The Matroska Multimedia Container

- This is an open standard free container format, a file format that can hold an unlimited number of video, audio, picture or subtitle tracks inside a single file.
- It is intended to serve as a universal format for storing common multimedia content, like movies or TV shows.
- Matroska is similar in concept to other containers like AVI, MP4 or ASF, but is entirely open in specification, with implementations consisting mostly of open source software.
- Matroska file types are .MKV for video (with subtitles and audio) .
- MKA for audio-only files and .MKS for subtitles only.

3GPP Multimedia File

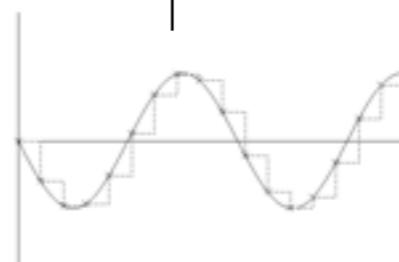
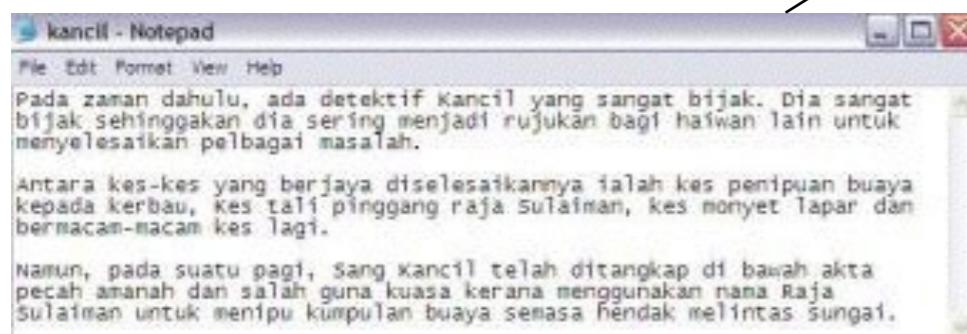
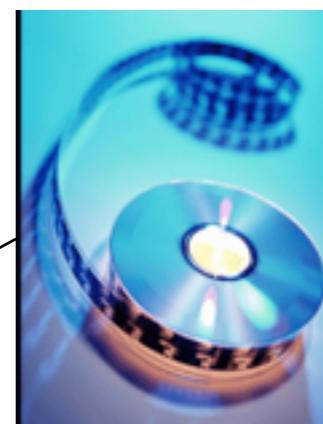
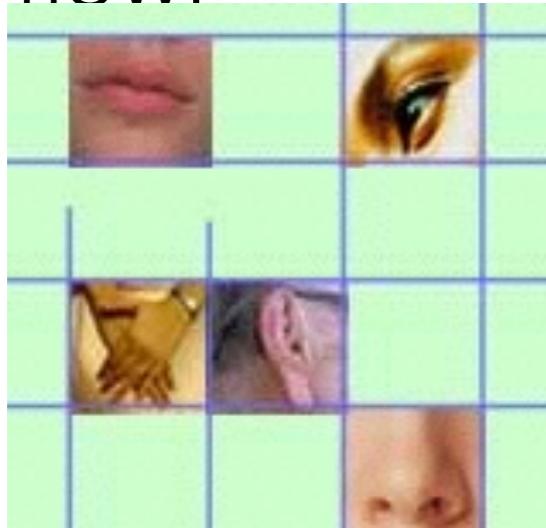
- Audio and video container format developed by the 3rd Generation Partnership Project (3GPP)
- It is designed as a multimedia format for transmitting audio and video files between 3G cell phones and over the Internet.
- Commonly used by mobile phones that support video capture.

Multimedia Authoring Tools



What is authoring tools?

- The tools by which various media components are brought together (integrated) into a structure and flow.



Multimedia Software Tools

- Cool Edit
- Sound Forge
- Adobe Illustrator
- Adobe Photoshop
- Macromedia Fireworks
- Adobe Premiere
- Cyberlink Power Director
- Macromedia Flash
- Macromedia Director
- Java 3D
- OpenGL
- Direct X
- 3D Studio Max

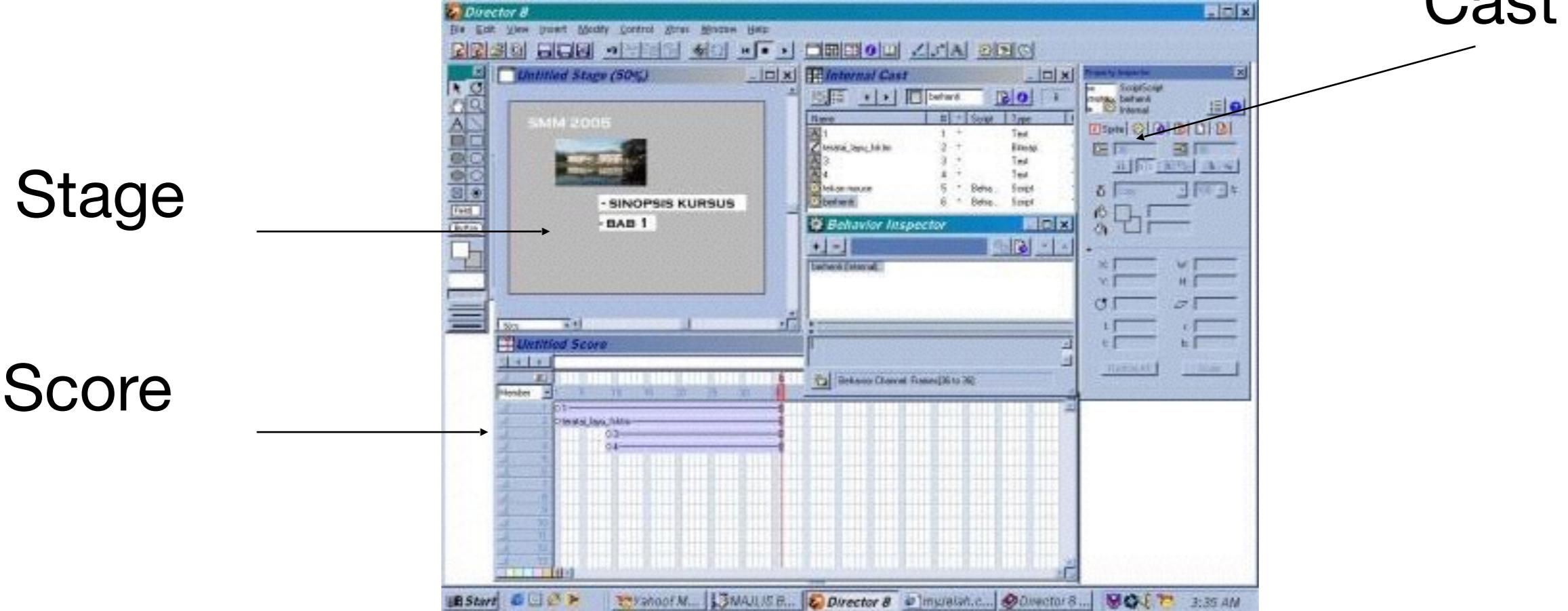
Authoring Metaphors

- * Most media integration tools will take or use one of the following metaphors:
 - a) Movie screen metaphor
 - b) Slide show metaphor
 - c) Linked screens

Authoring metaphors

a) Movie screen metaphor

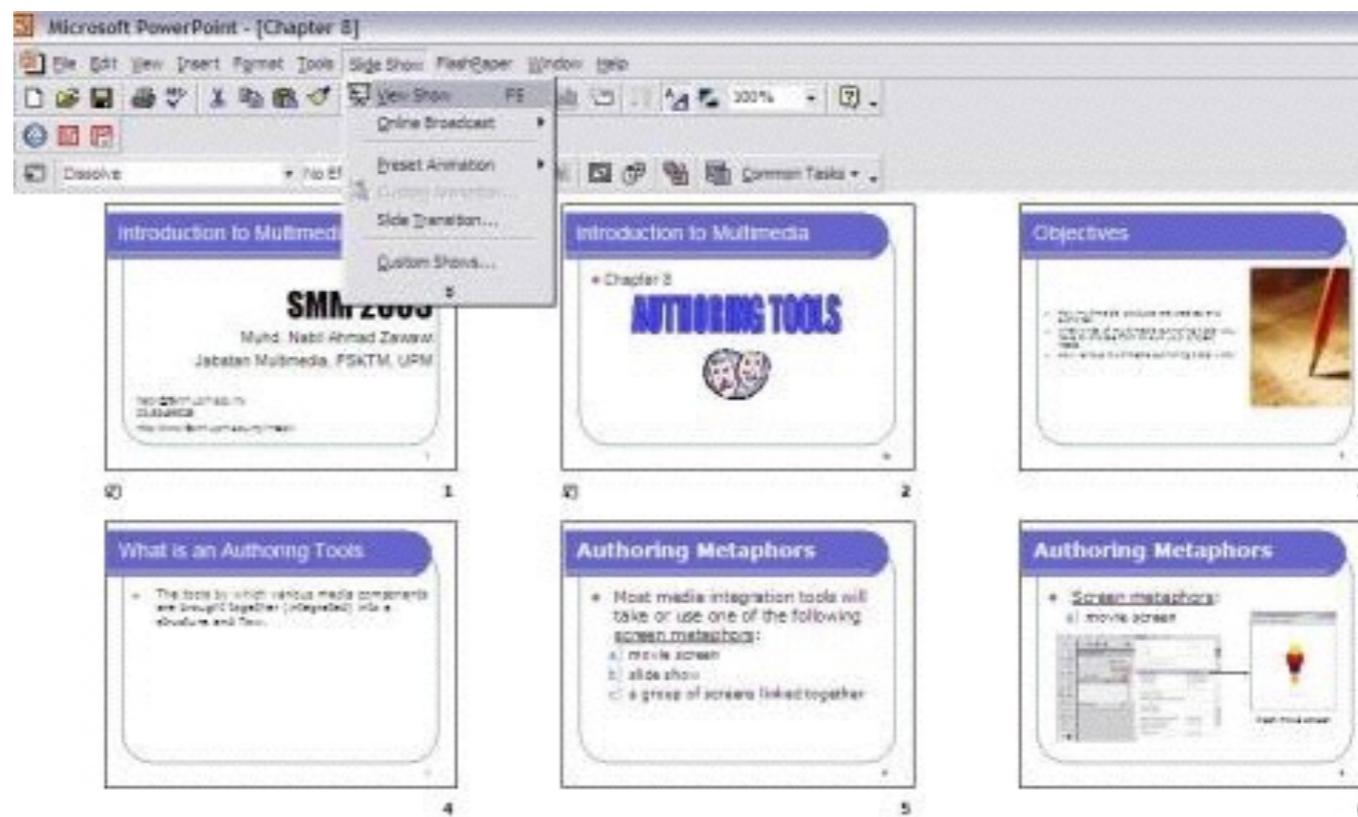
- Movie refers to the product of the authoring:
 - Linear/Interactive movie
- Also refers to authoring tools paradigm that contains Cast/Score/Scripting
- Example: Macromedia Director



Authoring metaphors

b) Slide show metaphor

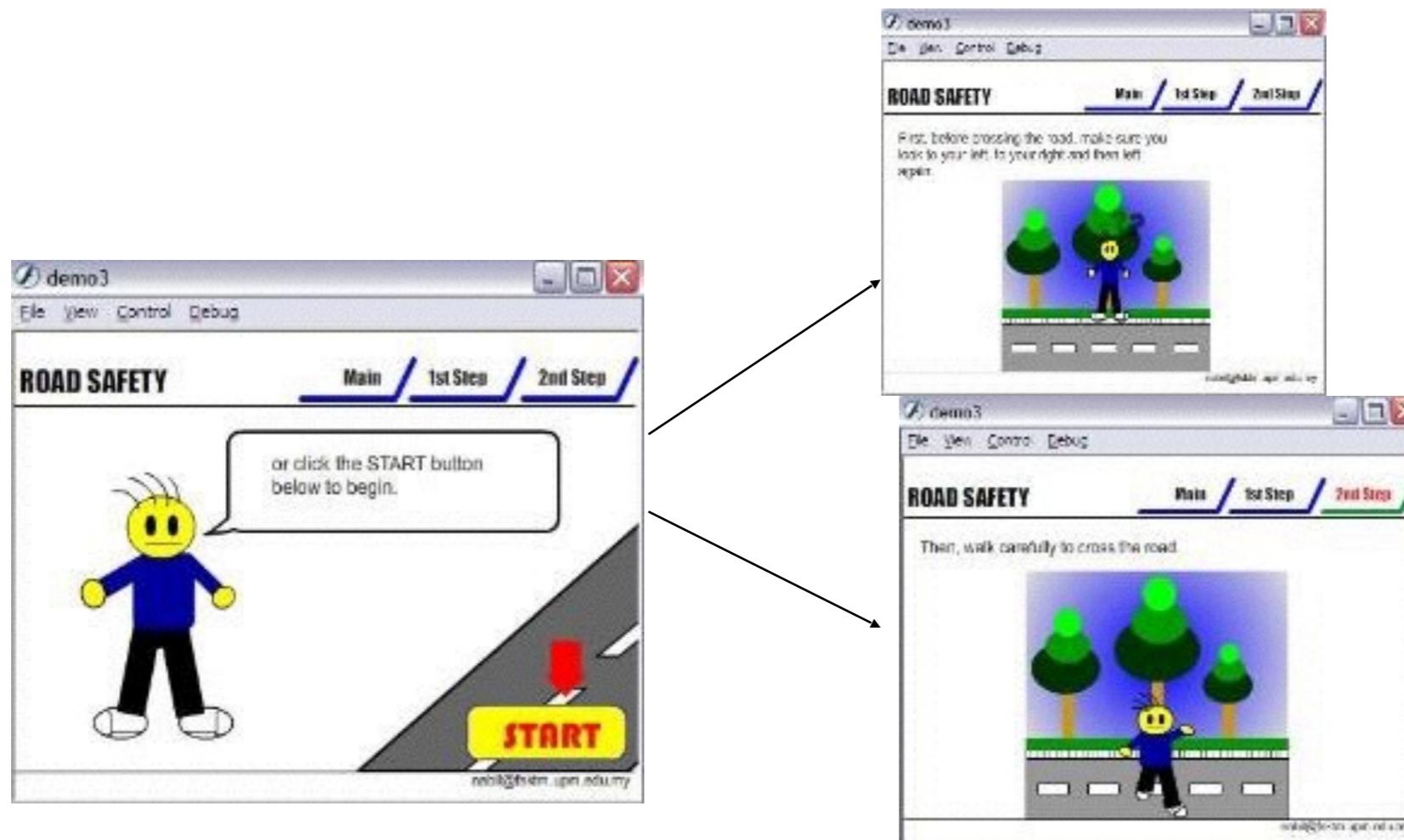
- A linear presentation
- Example: Powerpoint



Authoring metaphors

c) Linked Screens

- A group of scene linked together



Presentation software

- Templates are used to determine how the heads and subheads are formatted and displayed over backgrounds, including: (etc PowerPoint)
 - position
 - size
 - font
 - style
 - color

Example: power point

The image is a collage of Microsoft PowerPoint screenshots, numbered 4 through 12, illustrating various features and development metaphors:

- 4:** Microsoft PowerPoint - [Chapter 8] window showing the ribbon menu.
- 5:** A slide titled "Authoring Metaphors" listing "b) Slide show metaphor" and "c) Linked Screens".
- 6:** A slide titled "Integration Development" listing "Most Authoring tool have the following in their development interface:" with points 1-4.
- 7:** A slide titled "Authoring Metaphors" listing "d) Card stack".
- 8:** A slide titled "Integration Development" listing "e) A series of figures".
- 9:** A slide titled "Integration Development. Flash" listing "f) Card stack (tabs)".
- 10:** A screenshot of the "New Slide" dialog box showing "Choose an AutoLayout:" with various layout options.
- 11:** A screenshot of the "New Slide" dialog box showing a "Bulleted List" input field.
- 12:** A screenshot of the "Integration Development. Flash" slide showing a card stack interface.

A large arrow points from the text "Style and format" to the "New Slide" dialog box (slide 10). Another arrow points from the text "templates" to the "Card stack (tabs)" section of the "Integration Development. Flash" slide (slide 12).

Categories of authoring tools

- ✖ Can be categorized into
 1. Presentation software
 2. Tools for creating production
 3. Interactive training and education
- ✖ Some authoring tools can fit into more than one category.

Tools for creating production

- Typically oriented toward producing content that is more ambitious than the slide-show level
 - (more interactive & dynamic)
- Usually integrate all types of' multimedia data into a multitrack timeline that determines the evolution of events
- Interactivity takes the form of conditional branching (multiple linking) that can make navigation decisions based on user input and other conditions
- Production software creates dynamic content
 - EXAMPLE: mTropolis / AppleMedia Tool / MediaForge

Interactive training and education tools

- To create education or training content.
- Designed primarily to present information in an Interactive book.
- Multimedia-oriented programming languages such as Visual Basic represent another authoring alternative.
- Offers the higher flexibility, performance speed and power
- Example: Macromedia Flash, Authorware & Director

Types of authoring tools

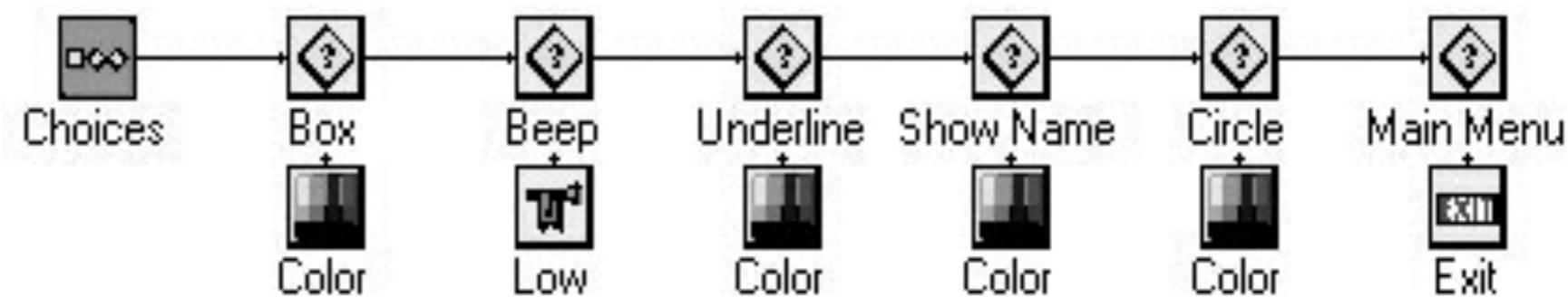
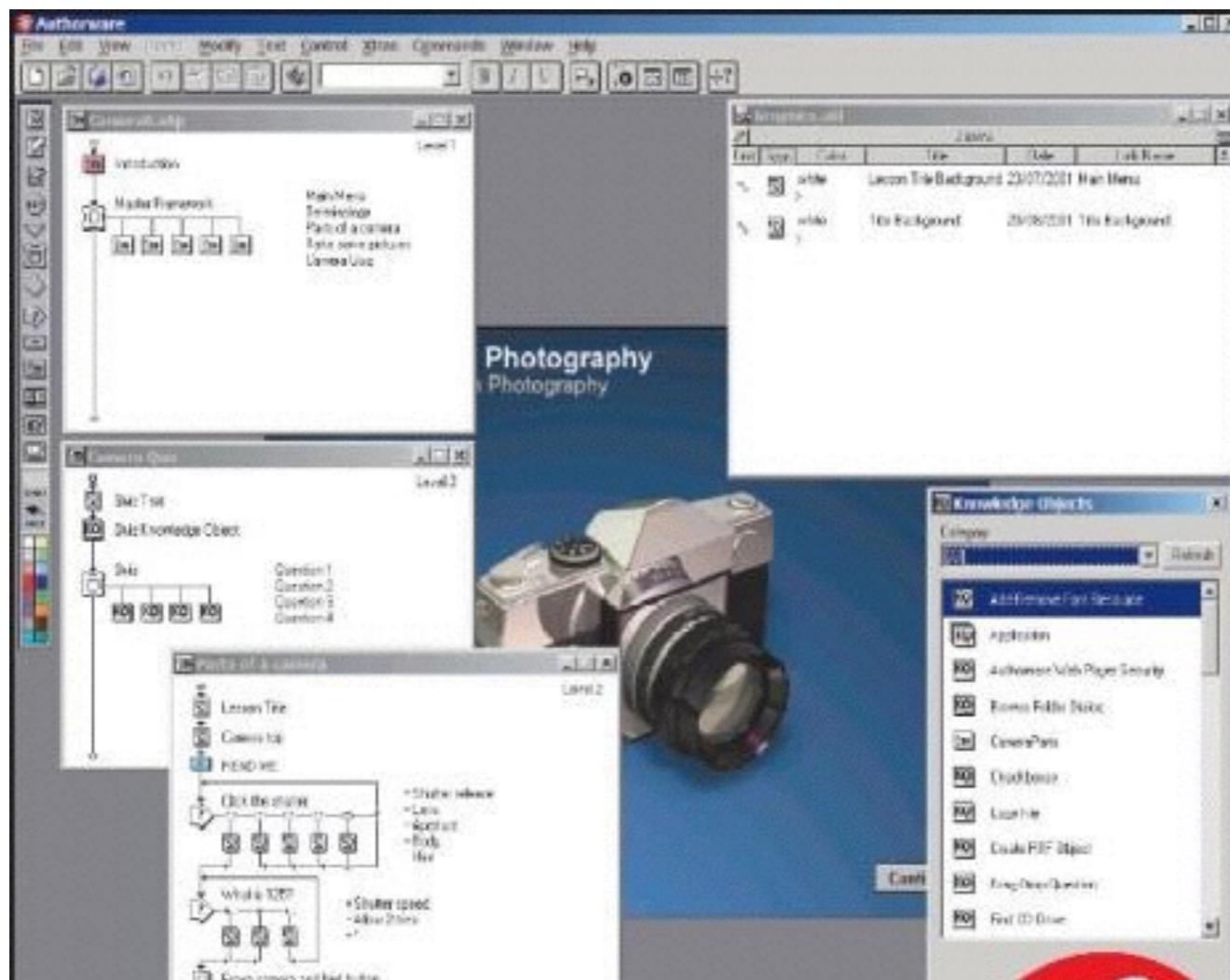
1. Card based
2. Icon based
3. Time based
4. Object based



Icon based

- Icons are gathered along the line.
- Provide visual development.
- Flow chart is created to show the organisation of icons or elements:
 - including activity list, results and done with dragging the icon/elements along the lines
 - each Icon represents a particular event – button, graphics, text, video
 - examples of authoring tools
 - Authorware(Mac/Windows)
 - IconAuthor (Windows)

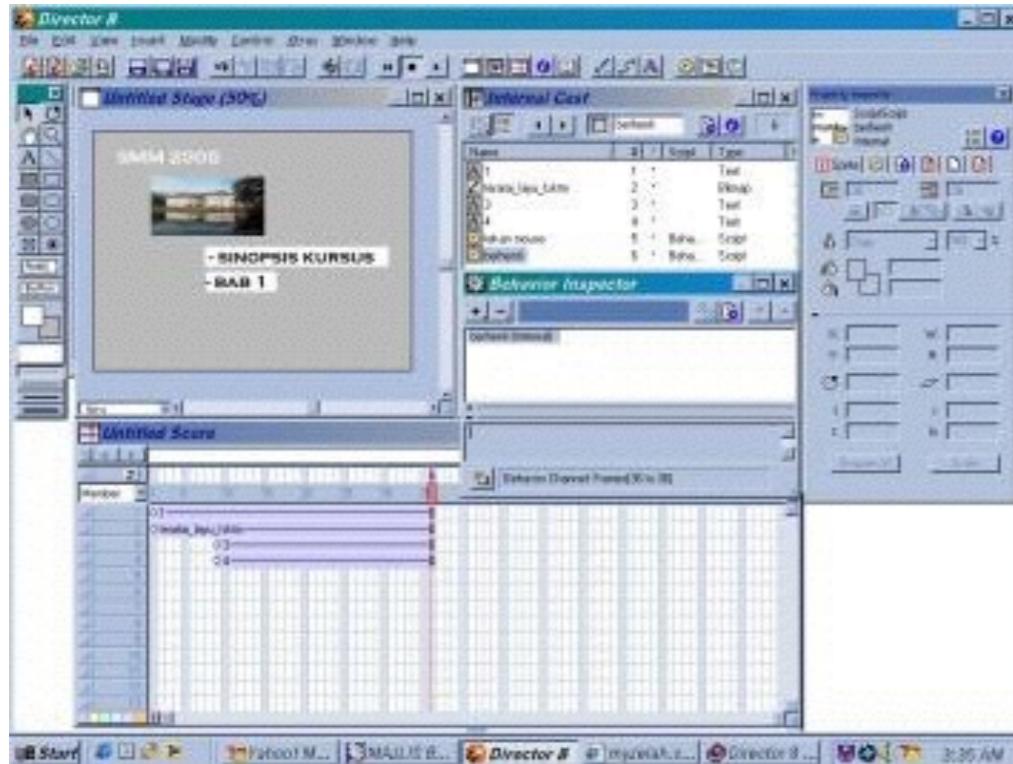
Icon based



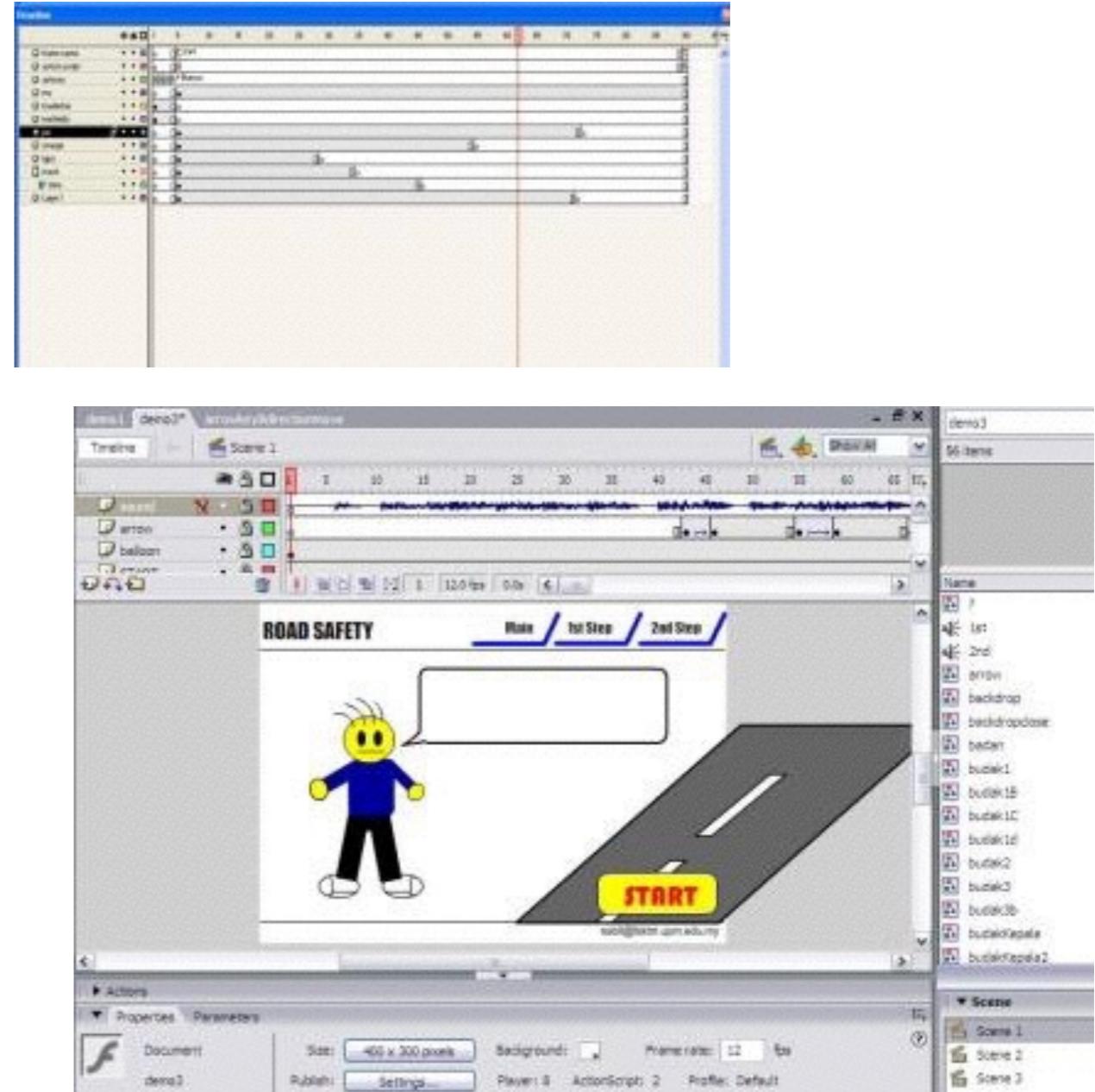
Time based

- The most popular used.
- Using “*timeline*” for organizing activities
- Also using “*framing*” – timely adjusted depending on the frame size
- Example:- Macromedia Director / Flash (Mac/ Windows)

Time based



Macromedia
Director



Macromedia Flash

Authoring capabilities

- ✖ Authoring tools should possess the following capabilities:
 1. Interactivity
 2. Playback
 3. Editing
 4. Programming / Scripting
 5. Cross Platform
 6. Internet Playability

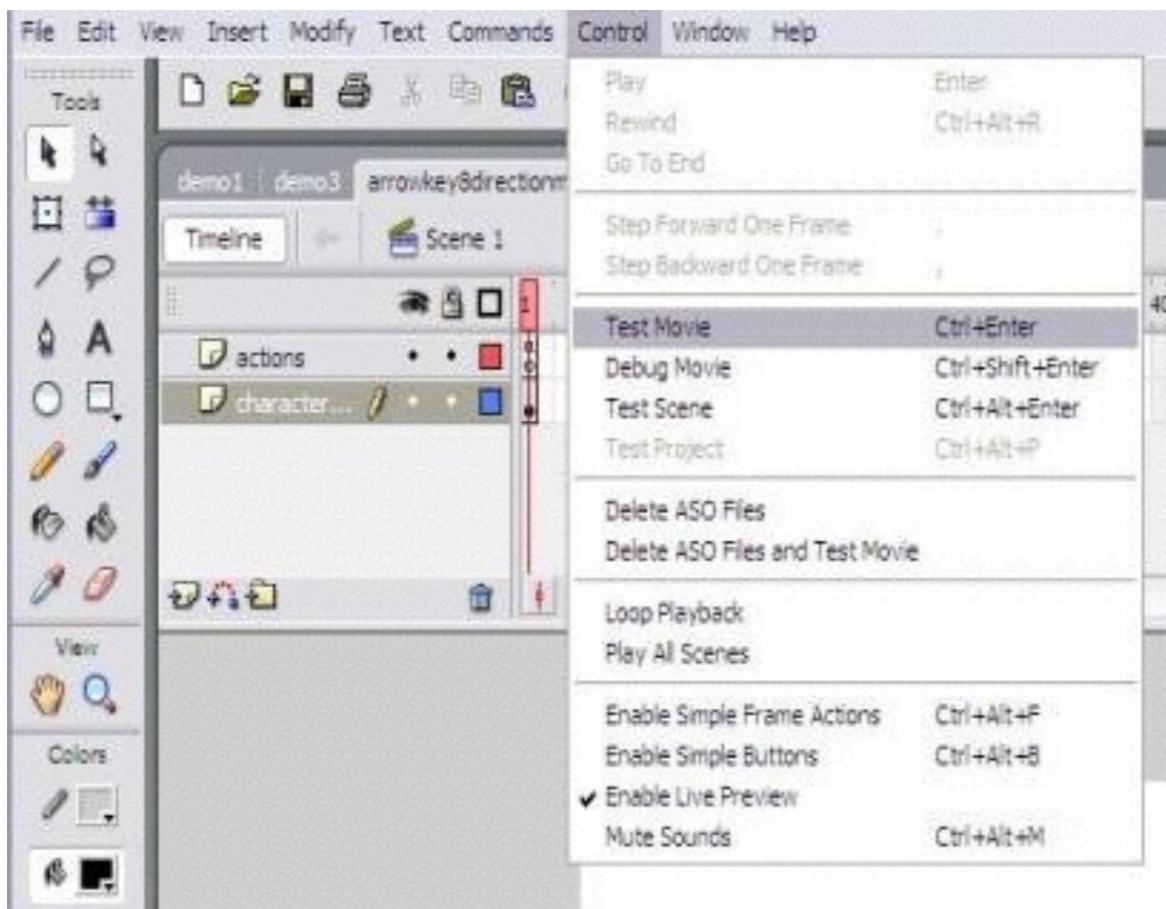
Authoring capabilities

1. Interactivity
 - + *Simple Branching*
 - ✖ Ability to jump to any part of the product
 - ✖ Eg:- by mouse click, keyboard input
 - + *Conditional Branching*
 - ✖ Ability to jump to any part of products if agreed to certain condition (statement IF-THEN)
 - + *Structured Language*
 - ✖ complex programming to enable the interactivity and navigation

Authoring capabilities

2. Playback

- + Ability to see and to test the ongoing or the completed project.

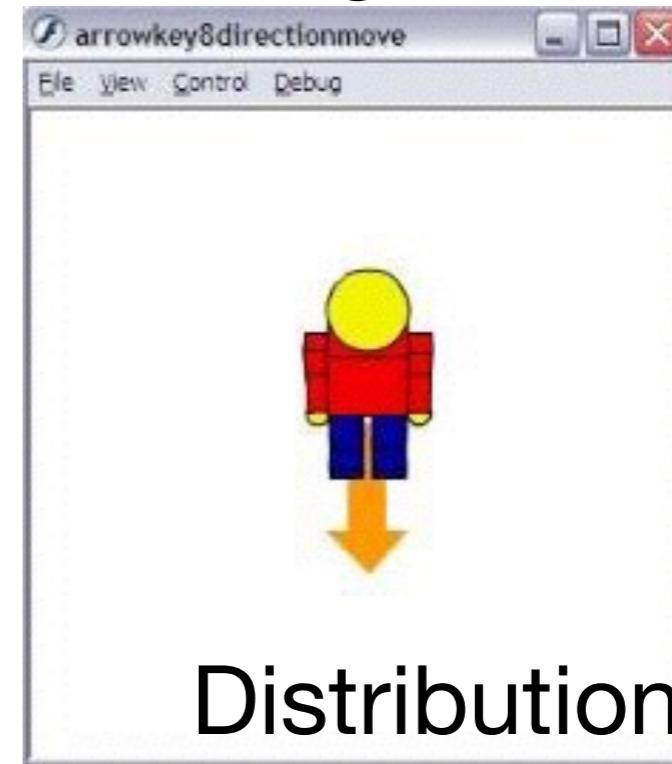


Playback (timeline / movie tester)

Authoring capabilities

3. Distribution / Delivery

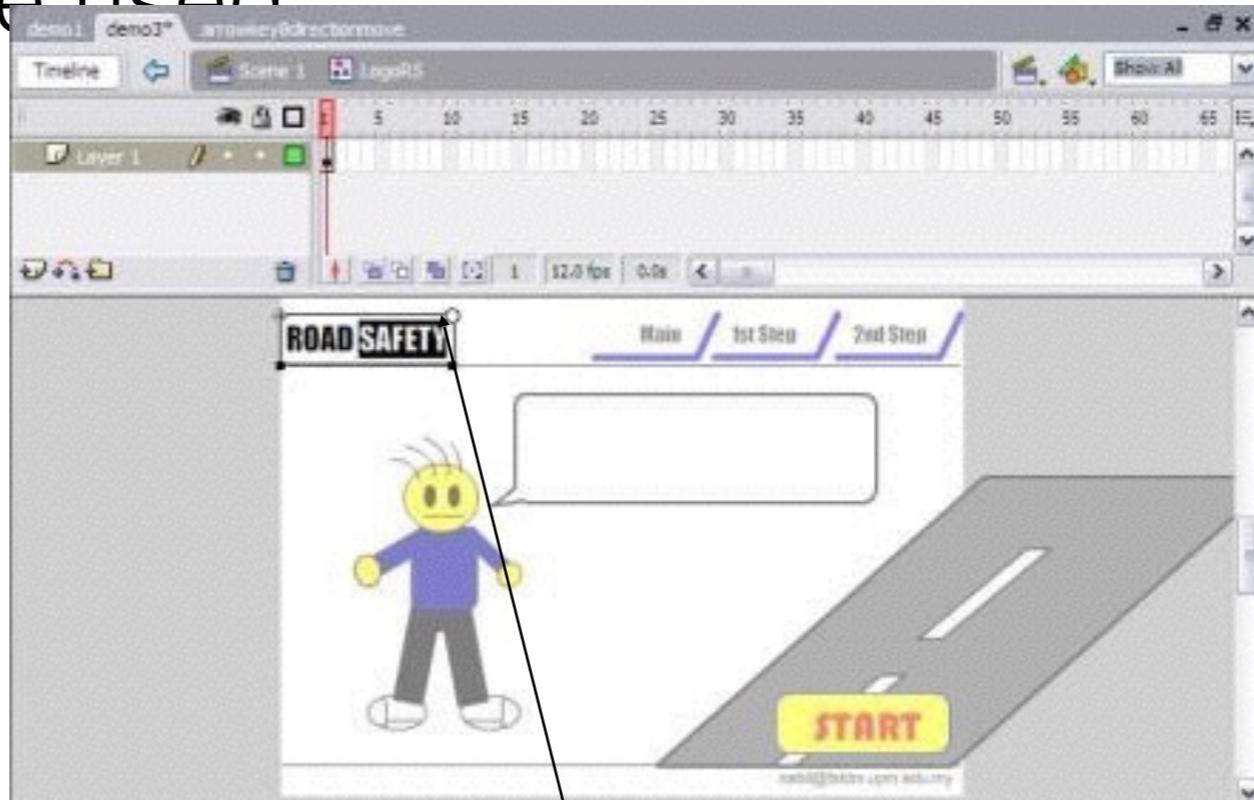
- Able to create a ‘RUN TIME’ mode.
- This will exclude the need of the authoring tools during execution.



Authoring capabilities

4. Editing

- + generally, authoring tools are capable on text and image editing
- + capable on doing other editing too, depending on the software used



Editing

Authoring capabilities

5. Project Organization

- + *FLOWCHARTING and STORYBOARDING availability*
- + this will help on configuring interactivity



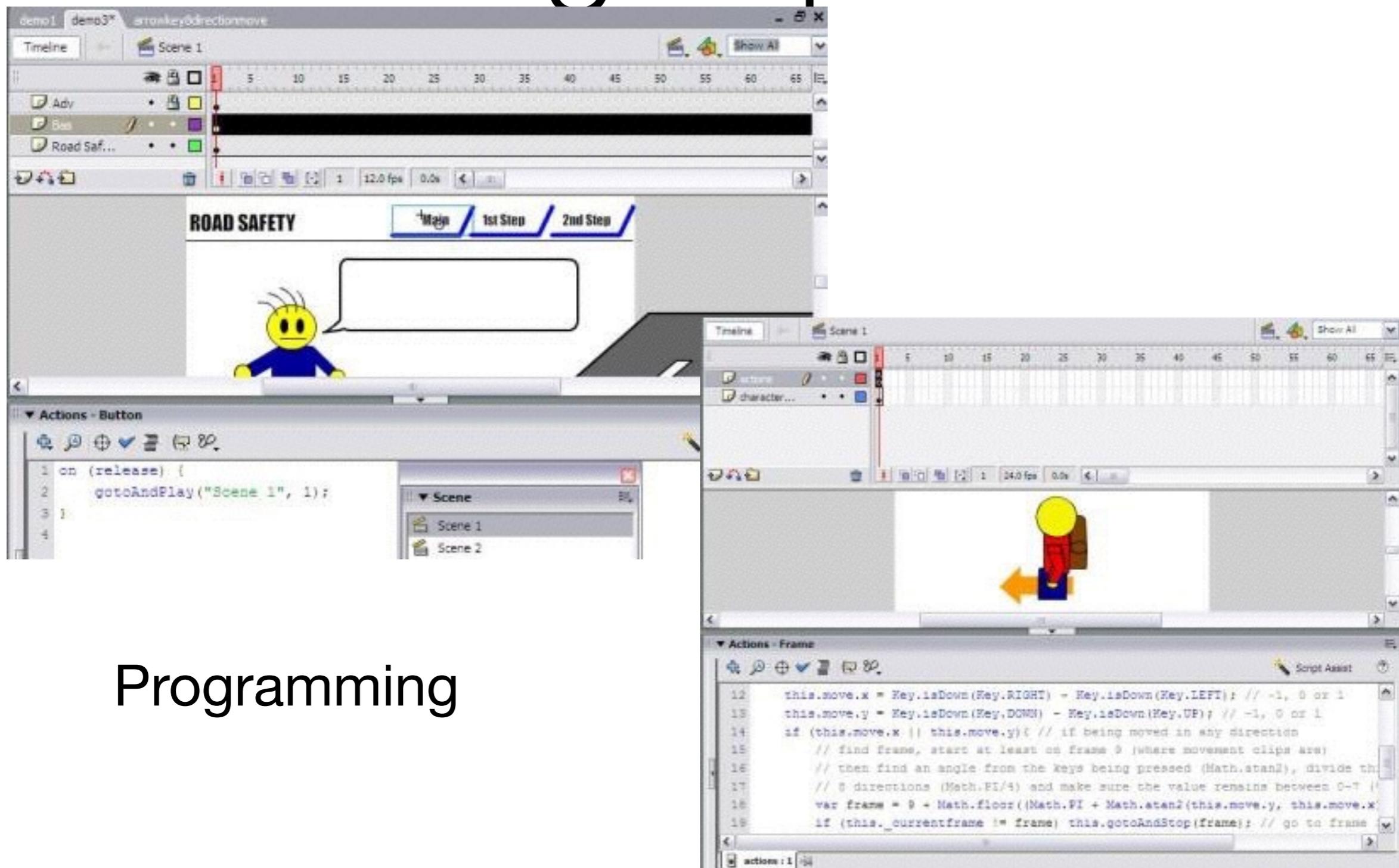
Flowcharting / Storyboarding

Authoring capabilities

6. Programming

- + Programming used for flexibility.
- + Authoring tools offers an easier and less time consuming to develop:-
 - ✖ *Visual Programming* - Using icon, button, drag & drop graphic, audio .
 - * Eg: Authorware
 - ✖ Scripting - programming language for authoring tools.
 - * Eg: Director = **LINGO**, Flash = **ActionScript**
 - ✖ Support basic programming language - C, BASIC
 - * to make it more flexible
 - ✖ *Document Development Tools*
 - * Authoring tools that able to merge documents, indexing, search engine and linking

Authoring capabilities



Programming

Authoring capabilities

Html code:

```
<html>
```

```
  <body>
```

The content of the body element is displayed in your browser.

```
  </body>
```

```
</html>
```

Result:

The content of the body element is displayed in your browser.

Authoring capabilities

7. Cross Platform

- + Ability to perform on all platforms including linux, MAC and Windows.

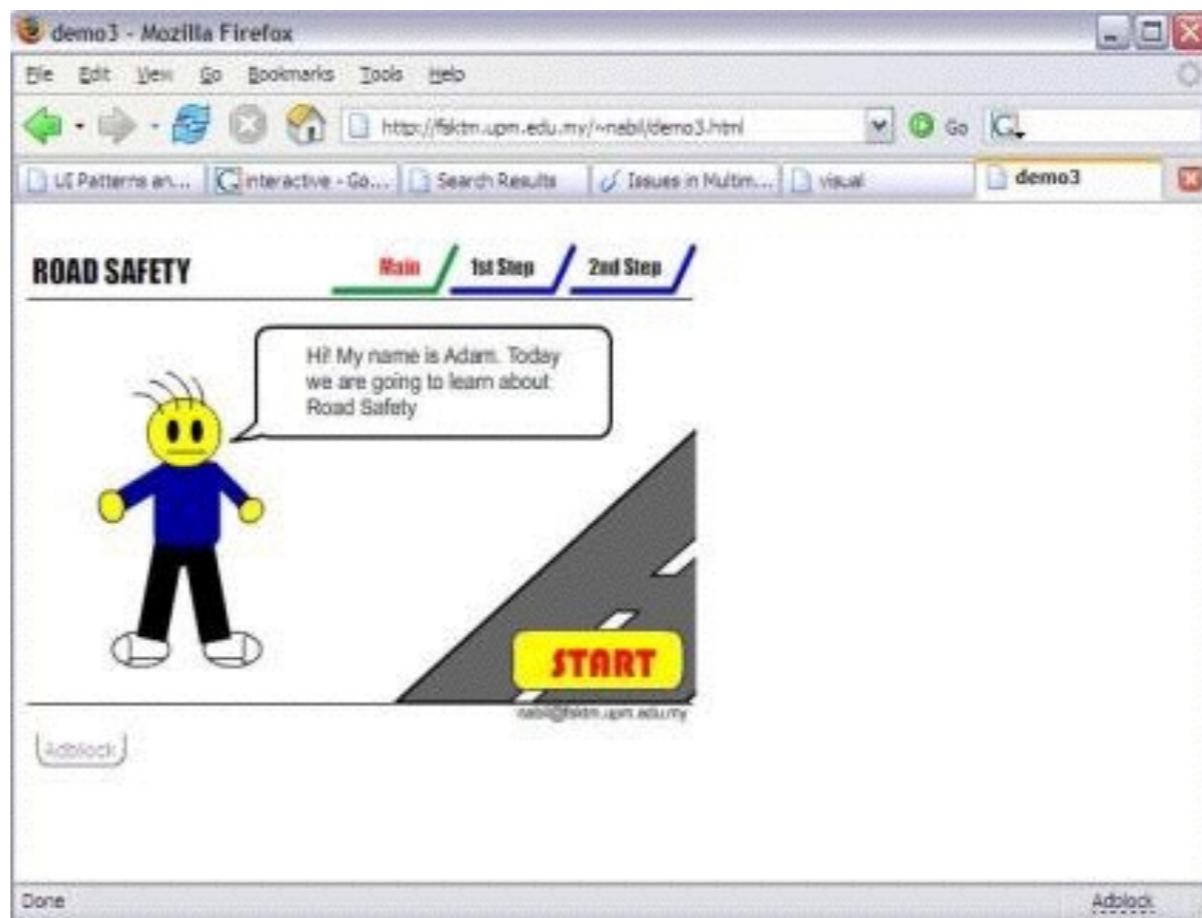


Cross Platform

Authoring capabilities

8. Internet Playability

- Ability to create the output for web enabled application.
- Eg:- **HTML**



Internet Playability

Adobe CS Family



Adobe Me...oder CS6



Adobe Bridge CS6



Adobe Sp...rade CS6



Adobe Audition CS6



Adobe Fla...uilder 4.6



Adobe Dr...eaver CS6



Adobe Fireworks CS6



Adobe Prelude CS6



Adobe Encore CS6



Adobe Aft...er Engine



Adobe Pre...e Pro CS6



Adobe Flash CS6



Adobe Illustrator CS6



Adobe Photoshop CS6



Adobe InDesign CS6

iLife App (Apple)

