History of Communications Media

Class 8

History of Communications Media

- What We Cover Today
  - Finish up Phonograph
  - Television
  - Xerox Copier
  - Computer & Internet

Phonograph

- Phonograph Developments
  - Mid-1920s – Electrical recording using microphones and acetate records replaces acoustic recording
  - Radio initially has a depressing impact on phonograph sales but later serves to popularize records sales
    - Quality of radio music was superior to that of phonograph music
    - 78 rpm records could contain only 4 minutes of music

Acoustic recording - Until the mid-1920s, when electrical recording, which used microphones and acetate masters, became the standard, recording was done by the 'acoustic' method. Performers sang or played into a tin horn connected to a hose, which was in turn connected to a needle. The needle turned these sonic impulses into grooves on a wax disk. The process turned high and low notes into noise, and percussive sounds from drums, pianos, or musicians tapping their feet knocked the needle off the wax.
Radio - Radio stations, of course, had started out in the 1920s by relying heavily on phonograph music, but that had changed with the rise of the networks, which showcased live music, largely to avoid copyright infringement suits from composers and record companies. The crash of 1929 nearly destroyed the phonograph industry as people turned to radio as their main source of music. But by the late 1930s a renewed symbiotic relationship began between the two industries, especially when the country's 162 non-network stations (almost one-quarter of all AM stations in the country) were exempted from the deal struck between the American Federation of Musicians and the networks that restricted the use of mechanically reproduced music on the air. These smaller stations became outlets for the 400 new recording companies started during the 1940s. Now local stations could produce regional, even national hits, and new ties—which were later to become problematic—developed between record company representatives and DJs. They also promoted and popularized new musical genres, such as rock 'n' roll.

Phonograph

- Phonograph Developments
  - 1948 - The 33-1/3 long-playing record (LP) and 45-rpm single were introduced
    - Unlike the earlier 78 format, these were vinyl rather than glass or metal coated with shellac
    - This paved the way for both high fidelity recordings and
  - 1950s – High Fidelity recordings
    - Created the audiophile
  - 1958 - The first stereophonic phonograph discs made available to the general public in 1958.
  - 1961 - The FCC announces stereo FM technical standards

The "battle of the speeds between Columbia Records, which in 1948 had introduced its more expensive 33 1/3 rpm long-playing album, and RCA Victor's much cheaper 45 rpm singles format, inadvertently also pitched the adult against the youth market. !! The cheaper records -- which could be played on a small box phonograph that sold for $12.95 -- were simply more affordable to kids on allowances, and they allowed the kid to sample a variety of musical styles, especially early rock 'n'
ro ll.

High fidelity - The hi-fi craze of the late 1940s and 1950s had been started by tinkerers dissatisfied with the sound quality available in commercially manufactured phonographs. They began assembling their own "rigs" out of separate compo-nents, paying special attention to and customizing the wiring that connected the parts into a whole. The proper matching and balancing of components was critical to success. The goal was to reproduce in one's living room the way clas-sical music sounded in a concert hall. The most sensitive human ear can hear sounds ranging from 20 to 20,000 cycles per second. Most old 78 rpm records could play up to only 7,500 cps, and AM radio could reach a maximum of 10,000 but usually broadcast at 5,000 cps. Audiophiles wanted to push beyond these ranges, which cut off the highs as well as the lows of most music. "Hi-fi is, in fact, an attitude," reported *Time,* "a kind of passion to reproduce music exactly as it sounded in its natural setting."

Stereo - Stereophonic sound is the reproduction of sound, using two or more independent audio channels, through a symmetrical configuration of loudspeakers, in such a way as to create a pleasant and natural impression of sound heard from various directions, as in natural hearing.

Phonograph

- Phonograph Developments
  - 1961 - Licensed regular stereophonic FM radio broadcasting begins
  - 1960s – Dolby stereo recording
  - 1963 – Introduction of the audio cassette
  - 1971 – Quadraphonic sound
    - Led the way to the surround sound systems of today
  - 1982 – Dolby surround sound
  - 1985 – "Yellow Book" standard for CD-ROMs published
    - Meant that CD-ROMs could hold either music or data

Audio cassette - Between the early 1970s and late 1990s, the cassette was one of the two most common formats for prerecorded music, first alongside the LP and later the Compact Disc.[2] *Cassette* is a French word meaning "little box." Compact Cassettes consist of two miniature spools, between which a magnetically coated plastic tape is passed and wound. These spools and their attendant parts are held inside a protective plastic shell. Two stereo pairs of tracks (four total) or two monaural audio tracks are available on the tape; one stereo pair or one monophonic track is played or recorded when the tape is moving in one direction and the second pair when moving in the other direction. This reversal is achieved either by manually flipping the cassette or by having the machine itself change the direction of tape movement ("auto-reverse").[3]

Quadraphonic sound - The development of quadraphonic records was announced in 1971. These recorded four separate sound signals. This was achieved on the two stereo channels by electronic *matrixing*, where the additional channels were combined into the main signal. When the records were played, phase-detection circuits in the amplifiers were able to decode the signals into four separate channels. There were two main systems of matrixed quadrophonic records produced, confusingly named SQ (by CBS) and QS (by Sansui). They proved commercially unsuccessful, but were an important precursor to later 'surround sound' systems, as seen in SACD and home cinema today.

Dolby Surround Sound - Dolby Surround was the earliest consumer version of Dolby's multichannel analog film sound decoding format Dolby Stereo. introduced to the public in 1982 during the time home video recording formats (such as Betamax and VHS) were earlier introducing Stereo and HiFi capability.The term Dolby Surround is used as not to confuse theater stereo which is at least four channels of audio with home stereo which is two. Dolby Surround is the earliest domestic version of theatrical Dolby Stereo. In the consumer surround sound,, four channels of audio information — left, center, right, and mono surround — are matrix-encoded onto two audio tracks. The stereo information is then carried on stereo sources such as videotapes, CDs, DVDs, and television broadcasts from which the surround information can be decoded by a processor to recreate the original four-channel surround sound. Without the decoder, the information still plays in standard stereo or monaural.

Phonograph

- Impact of the Phonograph
  - Along with radio, made music an major part of people's lives
    - Before the phonograph (and radio), hearing music required the presence of musicians, singers, or a player piano
    - Made listening to music a passive experience
  - Provided much of the broadcasting content for both early radio and current FM radio
  - Fostered the development of FM radio

Phonograph

- Impact of the Phonograph
  - Gave rise to the juke-box (and the teenage hangout)
  - Fostered the development of portable music media
    - The record gave way to the 8-track, then the audio cassette, and finally the CD-ROM and iPod.
  - Provided through the sale of records (and related media) a major source of income for musicians, singers, opera companies, choruses, and others involved with music

Phonograph

- Impact of the Phonograph
  - In the form of the audio cassette and its related player-recorder
    - It gave Third World peoples a relatively cheap and easy technology by which they could make audiotapes of whatever they wanted to hear -- their native music, stories, myths, chants, prayers, sermons, and speeches. Their impact has frequently been revolutionary.
    - It permitted the survival and even the renaissance of many forms of local music and stories that were in danger of dying out
    - It facilitated the cross-cultural dissemination of musical forms and styles

Third World effects - "The Islamic revolution of Iran in 1978 and 1979 was probably the first revolution of the world conducted primarily through the cassette recorder. For many years before the revolution, the Ayatollah Khomeini and other exiled religious leaders recorded sermons of revolution in Paris and then distributed them throughout Iran. Each tape player is also a recorder, so that each owner can make new copies as well as play the old ones. In this way the anti-Shah and anti-Western message of the casette spread throughout Iran from one backwater village to another. Even those beyond the reach of the government-controlled radio found easy access to the ideas of the Ayatollah in France."

Television

- Television is based on the discovery of photosensitivity in 1873
  - When certain metals (like selenium) are exposed to bright light, they emit an electrical current
  - This led to the concept of converting an optical image to an electric current and then converting the current back to an image
  - This led eventually to television, the wire photo, and the fax machine

Photosensitivity – The concept of photosensitivity was based on the discovery that certain metal (like selenium) when exposed to bright light gave off an electrical current. This led to the idea of converting an optical image to a matching electrical pattern at a transmitting site and then converting the pattern at a receiving site back to an optical image.

Television

- Early History
  - 1875 - George R. Carey of Boston proposed the use of two matching banks of light-sensitive cells connected by a cable that had a separate transmission circuit for each picture element
  - 1881 – Sheldon Bidwell described a facsimile scanner that moved a selenium element over an image area
  - 1884 – Dr Paul Nipkow patented a scanner that rotated a disc bearing a spiral of small apertures over the image to be scanned

Television

- Early History – 2
  - Two crucial discoveries
    - Cathode rays or beams of electrons – discovered by Sir William Crookes in 1878
    - Thermionic emission (the Edison Effect) was identified as the cause of the blackening of incandescent light bulbs in 1883
  - 1892 – Elster and Geitel devise the photoelectric cell

Edison had over a thousand patents, but made only one scientific discovery – the Edison Effect. This effect was to be a key concept behind many future innovations in electronics, but Edison, himself, did not see the technological possibilities or consequences inherent in his discovery. One use of the Edison Effect was in the Fleming valve of 1904 to detect wireless radio signals.

Television

- Early History - 3
  - 1897 – Karl F. Braun creates a tube that focuses and deflects Crookes' cathode rays
    - This was the basis of both the television picture tube and the modern cathode ray oscilloscope.
  - 1906 – Max Dieckmann and G. Glage, using Braun's tube, devise a facsimile system
  - 1906 – Lee De Forest invents the 3-element audion tube
    - This permits amplification not only of voice signals but also of the weak signals obtainable from image scanning systems

Television

- Early History - 4
  - December 29, 1923 – Vladimir Zworykin filed for a patent for an all-electronic television system employing an electronically scanned camera pickup tube and a cathode ray display tube
  - 1925 – John Logie Baird and C. Francis Jenkins succeeded in transmitting silhouette still picture images via radio
  - January 13, 1926 – Baird succeeds in transmitting moving images in which the gradations in tone scale make it possible to recognize facial features and expressions

Zworykin & CRT - Both Vladimir Zworykin and Philo T. Farnsworth believed that a cathode ray tube (CRT) -- a tube with an emitter filament at one end and the other end painted with a fluorescent chemical -- could, when a current is applied to the filament, display on the fluorescent surface of the tube the pattern made by a stream of electrons. Both also believed that if that pattern could be controlled -- could be made to correspond to a generating image -- a transmitting CRT could translate photographs into electricity and a receiving CRT could convert the electrical signal back into an image.
Baird - Baird's system was a mechanical-electronic system that used a mechanical scanner; Zworykin's was all electronic system. By 1929, Zworykin had improved his system to the point where he was able to impress the Institute of Radio Engineers that his system was workable.

Television

- Early History – 5
  - 1927 – Dr Ernst Alexanderson at GE begins experimental television transmissions over W2XAD in Schenectady, NY
  - 1934 – NBC began transmitting electronically scanned 343-line 30 frame/sec interlaced TV
  - September 10, 1938 – The RMA Standards Committee submits its proposed standards to the FCC

Two things that hampered the development of television in the 1920s and 1930s were 1) the existence of incompatible mechanical-electrical television and electronic television systems; and 2) the absence of either government or industry transmission standards. By 1933, it was evident that all electronic television systems offered picture quality superior to that of mechanical-electrical systems. Each experimental television station, however, was free to choose its own standards. By 1935, it was clear that uniform transmission standards were essential if the development of television were to proceed. If receivers for the general public were to be produced, they must match the characteristics used in the transmission system and all transmissions must be compatible. This led the Radio Manufacturers' Association (RMA) to set up a standards committee to develop a set of transmission standards and to win approval of those standards from the radio industry.

Television

- Early History – 6
  - The FCC, however, delayed approval of the proposed RMA standards
    - Dumont & Philco did not agree with them
    - CBS was working on a mechanical-electrical color TV system (which was incompatible with the RMA system) and wanted color taken into account
    - FCC felt that premature approval of standards would discourage R & D and thereby forestall the development of higher technical standards

FCC - The FCC's concern about technical standards was justified on two counts. First, their refusal to approve the initial proposed standards resulted in eventual development of those proposed by the National Television Systems Committee (NTSC), a committee of 168 specialists from the entire radio-television industry which resulted in picture quality superior to that of initial RMA-proposed standards. Second, the fact that the FCC approved the proposed NTSC standards in 1941 (and later declared that any color television transmission system must be compatible with existing black & white television) meant that U.S. television would have technical standards and TV picture quality that was lower than the European PAL and SECAM standards that were developed later. But the fact that the FCC and the television industry could not agree on standards until 1941 meant that Germany (where television was under the control of the government) was able to begin experimental television broadcasting in March 1935 and in 1936 distributed television broadcasts of the 1936 Olympics to selected sites in the German capital. In the late-1930s, the BBC began regular television broadcasts.

Color – On August 28, 1940, CBS made the first experimental broadcast of high definition color pictures transmitted from motion picture film using a mechanical field-sequential color system developed by a CBS team led by Dr Peter C. Goldmark. Live studio broadcasts followed on December 2, 1940.

Television

- Early History - 7
  - 1938 – To force FCC action, RCA announced that it would start regular TV broadcasts using the 441-line scanning standard
  - April 30, 1939 – RCA begins daily broadcasting
    - The initial broadcast featured the speech of President Franklin D. Roosevelt as he opened the 1939 New York World's Fair
  - May 1940 – An FCC report stated that when the radio-television engineers agreed on a standard, the FCC would authorize full commercial broadcasts
    - This led the RMA to establish the National Technical Standards Committee (NTSC) on July 31, 1940

Television

- Early History – 8
  - March 8, 1941 – The NTSC and the television industry approve of set of 22 standards that cover all technical phases of black & white television
    - This included increasing the number of scan lines from 441 to 525
  - May 1941 – The FCC approves and adopts the NTSC standards and authorized the transmission of commercial television programs, starting on and after July 1, 1941

Television

- Impact of World War II
  - Shut down television broadcasting and production of television sets
  - Diverted engineering talent and resources into radar, VHF-UHF-microwave band transmissions, ordnance direction, and scanning technology
    - Out of this came the image orthicon camera which produced a much sharper TV image with greater depth of field than the iconoscope

As of the start of U.S. involvement in WWII in 194 and the end of the war in 1945, there were fewer than 7,000 TV sets in the whole U.S. and only 9 TV broadcasting stations – 3 in New York City, 2 in Chicago, 2 in Hollywood, 1 in Philadelphia, and 1 in Schenectady NY.

Television – Homes with Sets

Year	1948	1950	1952	1955	1956	1960	1965
% Homes with sets	3%	10%	34%	67%	81%	87%	94%

Data from http://www.tvhistory.tv/Annual_TV_Households_50_78.jpg

Television

- Network TV Production
  - Demand for programming led the networks into TV production
    - All three networks set up television production studios first in New York City and then in Hollywood
      - 1949 – ABC purchased the old Vitagraph studio property in Hollywood and converted it to TV production
      - 1952 – CBS inaugurated program service from CBS Television City in Hollywood
      - 1952 – NBC started operations at NBC Television Center in Burbank CA

Television

- Independent TV Production
  - As noted in the discussion of the movies, the Studios initially saw television as a mortal threat, but independent movie producers saw TV as an opportunity
  - The independents began making films – mostly crime dramas, westerns, and comedies – for television
  - Among the most successful was Desilu Productions
    - The success of Disneyland with the theme park, TV programs, and movies mutually promoting each other led studios to see television as a potential ally

Independents – The independents realized that *filmed drama could earn for its producers more money than live programming ever could. Under a practice known as syndication, a producer would sell rerun rights to the network and to groups of local stations*." From the late 1940s on, independent producers began setting up shop on lower Sunset Boulevard in Hollywood and started cranking out cut-rate price films (mostly crime dramas & westerns) for television***. Tempted by the huge profits that could be made, many Hollywood producers made the switch to independent television production. Among them were two former RKO contract players -- Lucille Ball and Desi Arnaz -- who formed Desilu Productions***. By 1955, they were turning out hundreds of hours of programming every year, including *I Love Lucy.*

Television

- Color Television
  - In the late 1940s, CBS developed a 405 scan line 24 fps color system that could be transmitted in the established 6-MHz television channel
  - In 1949, CBS petitioned the FCC to establish standards for color television
    - At this time, there were 3 competing systems
      - CBS – Field sequential system
      - RCA – Dot sequential system
      - Color Television, Inc – Line sequential system

Television

- Color Television - 2
  - October 10, 1950 – the FCC found in favor of the CBS system
    - This led to a long court fight with RCA, but the Supreme Court in May 1951 decided in favor of CBS
  - June 25, 1951 – CBS began color TV broadcasting
    - Problem was that the CBS color system was incompatible with the NTSC black & white system
    - On October 22, 1951, manufacture of TV sets capable of receiving CBS color broadcasts was halted at the request of the Office of Defense Mobilization.

I.e. None of the millions of existing black & white TV sets could receive the CBS color telecasts, nor could set capable of receiving the CBS color broadcasts receive any black & white NTSC television signals.

Television

- Color Television – 3
  - 1950 - The disputes over color television led the television industry to form a second NTSC to devise a color TV system that would be compatible with the existing black & white NTSC system and acceptable to the industry
  - July 21, 1953 – The NTSC presented its proposals to the FCC
  - December 17, 1953 – The FCC approved the NTSC proposals, reversed its previous approval of the CBS system, and authorized color service to the public under the NTSC standards

Television

- Color Television – 3
  - January 1, 1954 – NBC began color broadcasting with the Tournament of Roses parade in Pasadena CA
  - 1954 – Networks open color TV studios, which include telecine facilities for broadcasting color movies using a 3-tube vidicon camera for scanning the film
  - 1955 – First color broadcast of the World Series

Color Television

Year	% of TV Homes with Color TV
1964	3.1%
1968	9.6%
1968	24.2%
1970	39.3%
1971	45.2%
1972	52.6%
1973	60.1%

Year	% of TV Homes with Color TV
1974	67.3%
1975	70.8%
1980	83.0%
1985	91.0%
1990	98.0%
1995	99.0%

Television

- Cable TV
  - Began in 1949 in Astoria OR
  - Had its origin in the fact that many communities lacked television service because they were either in or beyond the fringe reception area or signals were blocked by mountains, hills, or tall buildings
  - Cable operators soon found that they could put their own or other locally-originated programs on unused cable channels
    - This made cable and the channels they carried (like TNT and CNN) competitors to the broadcast channels

Television

- Cable TV
  - Cable operators also found that they could sell their cable services in cities by supplying ghost-free images and providing additional channels and programs
    - This led to the use of pay channels who provided closed-circuit programming of either sporting events or first-run motion pictures on either cable channels (such as HBO or Cinemax) or theater showings (as in the case of Heavyweight championship fights)

Cable Television

Year	No. Subscribers (millions)	% of TV houses
1960	0.65	1.4%
1965	1.275	2.4%
1970	2.49	7.6%
1975	3.45	15.5%
1977	12.168	16.6%
1979	14.814	19.4%
1980	17.671	22.6%
1981	23.219	28.3%
1982	29.340	35.0%

Year	No. Subscribers	% of TV houses
1983	34.113	40.5%
1984	37.290	43.7%
1985	39.872	46.2%
1987	44.970	50.5%
1988	48.636	53.8%
1989	52.564	57.1%
1990	54.871	59.0%
1995	62.956	65.7%
1999	67.592	68.0%

Television

- Notes about Television
  - TV has several genres
    - Many of these originated with radio or the movies – news, sports, adventure program, mystery-detective program, situation comedy, Western, soap opera, variety show, talk show, and game show
    - One genre originated by TV was the media event
      - Unlike other events, it is live, out-of-the-ordinary, pre-planned, organized by some public body, usually attracts a large audience, and is often ceremonial
      - The real event is the one experienced by the TV audience, not by those physically present at the event

TV genres - Producers and audiences alike routinely assume the existence of television genres. Broadcasters and TV listings in newspapers regularly classify programs by type: news, documentary, sports, action, adventure, Western, situation comedy, soap opera, variety show, game show, talk show, and children's cartoon.

Media events - Typically, media events are ceremonial events. !! In such events, the media rarely intrudes -- it interrupts only to identify the music being played or the names of the lesser participating dignitaries. The media upholds the definition of the event by the organizers, explains the meaning of the symbols used on the occasion, and only rarely intervenes with analysis and almost never with criticism. If the event originates in a particular location, that location is turned into a Hollywood set. Sometimes the original event is inaccessible to live audiences because the event is taking place far away. Some media events have no original anywhere because the broadcast is a montage originating in several different locations simultaneously. E.g. Prince Charles at the church while Lady Diana's carriage is drawn through the streets of London. Media events are not just televised events because those physically present at the site of (or one of the sites of) the media event will not see all that is seen by the television audience. T*hus, those near the Capitol steps to watch a Presidential Inauguration will not see, as television viewers do, the President-elect and outgoing President riding down Pennsylvania Avenue to the Capitol, or the new President and his family riding (or walking) from the Capital to the White House. Those at a televised NFL Football game will not see the close-up of the quarterback being sacked nor will the television audience see or hear the catcalls and comments directed by fans at the visiting team.*

Television

- Satellite TV
  - Enabled cable companies to create national (such as TBS) or even international (such as CNN) networks
    - Beamed programs from one location to cable systems all over the world
  - Permitted transmission from hundreds of cabled channels since cable TV and satellites were not limited to the 12 VHF or 70 UHF channels
  - Radically cut the cost of transmission, making special interest channels carrying niche programming financially feasible.

Starting in 1965, communications satellites went into orbit and that changed both the technology and the potential of cable TV. Communications satellites contain transponders [*Radio or radar transmitter-receivers activated for transmission by reception of a predetermined signal*] that amplify and transmit electromagnetic signals. Because communications satellites are in geo-synchronous orbits, they can receive signals from and transmit signals to virtually anyplace on the surface of the globe -- connecting a transmitting production studio in Atlanta with a receiving antenna in Alaska. Communication satellites did the following:

•Made it possible for cable companies to stop paying AT&T for use of phone lines

•Made it possible for some of the cable companies to create national (such as TBS) or even international (such as CNN) networks -- beaming programs from one location to cable systems all over the world.

•Permitted the transmission of signals from hundreds of cable channels since cable TV and satellites were not limited to the 12 VHF or 70 UHF channels the FCC had assigned to broadcast TV stations since cable-satellite transmissions were directed upwards rather than outwards and so did not interfere with other transmissions.

•Radically cut the cost of transmission , thus making special interest channels carrying 'niche' programming financially feasible. !! Hence, a proliferation of channels that appealed to small audiences -- cartoon channels for children, instructional channels for schools, religious channels, history channels for history buffs, science channels for scientists, music channels for teenagers, plus movie and shopping channels.

(p291-292) [Schwartz-Cowan]

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Television

- Notes about Television
  - Early conceptions of television linked two concepts
    - Visual motion imagery of spatially distant scenes
    - Simultaneity - what people saw was seen live in real-time

Inspired by the telephone, early notions of the televisual assumed that moving pictures would be seen *simultaneously* with their production, that is, that the medium would serve as something like an electronic camera obscura or telescope, bringing spatially distant scenes into direct visual proximity with the viewer. From 1876 onwards, an articulated notion of television as a "live" moving picture medium offered a counterpart to the "stored" moving images seen, for example, with Edison's Kinetoscope, and eventually with what we today celebrate as projected moving pictures (1895). The difference between these two basic approaches to moving picture technology was in some senses the same as that between the telephone and the gramophone. Both mediated the grain of the voice from sender/recorder to receiver, and both created an illusion of presence and even liveness. But only the telephone, like the period's sense of television, linked subject and object in real time. The gramophone like the film medium was by definition temporally disjunctive.

Television

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Television

- Notes about Television
  - The TV screen occupies about 15% of the viewer's visual field; the movie screen in a theater occupies about 70%.
    - The size of the movie screen and the darkness of the theater make the actor and his every action 'larger than life.'
    - The television screen, however, is smaller than life. It is not set in a darkened theater, but in the viewer's own home.

This helps explain why people perceive movie stars and TV stars differently. We ask what is a movie star really like in person but feel we know what a television actor's personality is like.

Television

- Notes about Television
  - Television does not communicate a sense of either the past or the future.
    - It is a present-centered, speed-of-light medium.
    - "Everything we see on television is experienced as happening *now.*
  - The visual-verbal world of TV makes an emotional appeal rather than a logical appeal and stresses the emotion-generating pictorial over linear, logical, and abstract argument.

Television

- Notes about Television
  - TV has been a mutating medium, changing in both its capabilities and its relations to viewers over time. i.e. There were distinct TV eras
  - TV had
    - Over-the-air broadcast TV
    - Satellite- and Cable- TV
    - The VCR-DVD era of TV
    - High Definition Digital TV

Television has from its start been in a state of transformation, mutating and redefining its capacities and its relations to viewers and other media, while inhabiting a dynamic media landscape. As both cultural practice and as a medium, it has taken on several distinct forms

Television

- Over-the-air broadcast TV era
  - Limited number of channels due to limited spectrum
  - Dominance of the major networks
  - Broadcasters seek a mass audience
- Satellite- and Cable-TV era
  - Potentially hundreds of available channels
  - Narrowcasting and niche broadcasting
  - Fragmented audiences

Television

- VCR- and DVD-era
  - Timeshifting
  - Permit watching of user-chosen media over broadcast media
    - Users can now see rental movies, music videos, documentary productions, or their own recorded video along with or instead of broadcast programs
- High Definition Digital TV era
  - Has more in common with the traditional movie than NTSC television
  - Permits merger of the computer and the TV

Television

- Impact of TV
  - Created a 'global village' in which boundaries that formerly isolated cultures had been broken down
    - Hollywood films and American television programs were now viewed throughout the world.
    - Led to the large-scale Americanization of World Popular Culture
  - Decreased cultural diversity between societies and increased cultural diversity within societies.

Americanization of world popular culture - Starting in the 1950s, when the first government-controlled television channels were established, European station managers always required more programs than local producers could provide. Demands for programming intensified in the 1980s and 1990s with deregulation, privatization, and the multiplication of commercial and cable channels. In addition, the European television industry lacked the funds, production skills, and the artistic talent to create programs comparable in quality to those produced in America. In addition, it was cheaper for European TV networks, particularly those in smaller countries, to buy American shows rather than make their own. Hence, by the 1990s, 75% of the airtime in Great Britain and Western Europe was filled with programs made in the United States.

Cultural diversity - The concept of cultural diversity has multiple meanings. !! There is a distinction between diversity within societies and diversity between societies. These two kinds of diversity often move in opposite directions. When one society trades a new artwork to another society, diversity within society goes up (art consumers have greater choice), but diversity across the two societies goes down (the two societies become more alike). Globalization and cross-cultural exchange tends to favor diversity within society, but to disfavor diversity across societies

Television

- Impact of TV
  - Changed radio from a broadcasting medium to a narrowcasting medium
    - Radio survived because it could target specific demographic groups (Blacks, teenagers, farmers, and ethnic minorities) that Network television tended to ignore
  - Caused the most popular radio programs and stars to migrate to TV
  - Changed the prime listening hours of radio from the evening to the commuting hours
    - This turned radio from an entertainment medium into an information medium

Narrowcasting - Radio managed to survive and thrive in the television era through its ability to target specific demographic groups -- teenagers (looking for acne remedies), blacks (looking for stores that would serve them and were near their neighborhoods), and farmers (looking for fertilizer and tractors) -- for advertisers through 'narrow casting.'!! Thus, local radio stations began broadcasting rock 'n' roll for teenagers, rhythm & blues for blacks, and country music for farmers and classical music for the well-educated.
Migration of programs to TV – Among the popular radio programs that migrated to TV were *Dragnet, Gunsmoke, The Jack Benny Show, Amos 'n' Andy, The Lone Ranger, Superman, Abbott & Costello, The Milton Berle Show, You Bet Your Life, The Cisco Kid,* and *Tom Corbett Space Cadet*
Radio as intelligence system – In the words of Marshall McLuhan, television changed radio from an entertainment medium into a kind of nervous information system. News bulletins, time signals, traffic data, and, above all, weather reports now serve to !! enhance the native power of radio to involve people in one another.

Television

- Impact of TV
  - Like radio in its initial phases, it created a top-down uniform mass popular culture
    - In some respects, this led to high-quality programming, especially news programming
  - People's social environment expanded from those they met face-to-face people to also include a whole host of media celebrities
    - Communications researchers have discovered that, for most people, these celebrities are socially real
  - TV assumed many of the socializing-values inculcating functions formerly performed by the family, church, and school

Top-down uniform culture – Due to limited spectrum (particularly in early television where only VHF channels were available), the number of television stations in any given metropolitan area was limited to 4 or 5 maximum in order to prevent interference. With three of these stations affiliated with one of the major networks – NBC, CBS, and ABC – it meant that network corporate heads determined what the American populace would see on TV. To use Washington DC as an example, there were four channels – 4, 5, 7, and 9 – 4 was NBC, 7 was ABC, and 9 CBS. Even Channel 5 was originally affiliated with the Dumont network which folded in December 1954

High-quality news programming - With a small number of firms or networks, collusion about product quality or composition can be easily facilitated. One could view news directors from the broadcast networks in the 1960s as fairly confident that their competitors would provide nightly news programming with high public affairs content. The FCC at the time required local broadcast stations to report on their public affairs coverage, so regulatory pressures reinforced the focus on hard news. The networks were owned by, or identified with, individuals willing to trade-off some profits for the psychic rewards of being identified as good corporate citizens. The industry trade association, the National Association of Broadcasters, helped facilitate quality restrictions through broadcaster codes. As cable technology and changes in spectrum allocation generated more competitors in the television marketplace, however, it became harder to maintain informal restrictions on the type of in-formation products offered. Collusion about quality, even if it has positive ex-ternalities for society, is harder to maintain as the number of potential stations that might defect and offer a more popular programming genre increases. This yields a version of a race to the bottom. As the number of competitors increases, it becomes more likely a station will offer soft news as a programming alternative.

Expanded social environment - In the words of David T. Courtwright in his *Violent Land. Single men and social disorder from the frontier to the inner city* , "In an electronic age, the social environment has come to mean more than flesh-and-blood people. It includes a

Television

- Impact of TV
  - Changed our conception of what is a fact
    - Facts reach us, not in the form of personal perception, not as something we ourselves have seen or heard, but in the form of communications, as something we have only heard or seen on TV
  - Altered the significance of physical presence at events
    - Experiencing an event no longer required physical presence

What is a fact? – In the words of William Donnelly in *The Confetti Generation. How the new communications technology is fragmenting America, "*We have come to rely on television for our knowledge about the world, and if we haven't "seen it on television," it isn't real—it's as if the event has not really occurred."

Altered concept of presence - As one perceptive scholar has observed, television and electronic media in general have radically altered the significance of physical presence in the experience of social events. Once upon a time, we assumed that physical presence and proximity were prerequisites for firsthand experience. Television has radically diminished the importance of physical presence at events of various sorts. It has become easy and convenient to view all kinds of performances without actually being there. In sum, the electronic media are seen as affecting social behavior not through the power of their messages but by reconfiguring the settings in which people do or do not interact and by weakening the customary bond between cultural events and specific physical sites.

Television

- Impact of TV
  - There is evidence to suggest that TV has decreased our attention spans and contributed to Attention Deficit Disorder
  - Television has become ubiquitous in a whole host of public spaces
    - Large screens broadcasting any number of images and advertisements can be found in most sports arenas, restaurants, airports, and shopping malls, even concert halls

Short Attention Spans - Most Americans consume moving images through the media of television and movies (and, to a lesser degree, through the Internet and video games). In recent years, in what many observers have called "the MTV effect," those moving images have become more nimble and less demanding of our attention. Jumping quickly from image to image in hastily edited segments (in some cases as quickly as one image every one-thirtieth of a second), television and, to a lesser extent, movies offer us a constant stream of visual candy. As ***New York Times*** television critic Alessandra Stanley noted, there have recently emerged many techniques "designed to hold short attention spans," including a "progress bar" at the bottom of the screen that counts down how much time is left for a video segment. A study published in 2004 in the journal ***Pediatrics***, for example, found a clear link between early television viewing and later problems such as attention deficit/hyperactivity disorder, and recent research has suggested troubling, near-term effects on behavior for young players of violent video games. Morris Berman in *Dark Ages America. The final phases of empire* noted "Television programs of twenty-five years ago seem sluggish to us now, and if we look back fifty years we see that in terms of action, movies were much slower, and that magazine articles were much longer and more complex." Berman also noted that sound bites from presidential candidates aired on television newscasts shrank in length from an average of 42.3 seconds in 1968 to 7.8 seconds in 2000. A survey of the top ten best-selling novels taken from the *NewYorkTimes* between 1936 and 2001 shows a drop of 43 percent in sentence length and of 32 percent in num-ber of punctuation marks per sentence

Video in the concert hall – Even the classical concert hall has been invaded by TV. In 2004, the New York Philharmonic experimented with a 15-by-20-foot screen that projected enormous images of the musicians and conductor to the audience during performances of Wagner and Brahms. The orchestra trustee who encouraged the project was blunt about his motivation: "We want to increase attendance at concerts, change the demographics," he told the ***New York Times***. "And the younger generation is more responsive to visual stimuli." A classical music industry consultant echoed the sentiment. "We have to recognize that this is a visual generation," he said. "They are used to seeing things more than they are used to hearing things." Symphonies in Vancouver, San Diego, Omaha, Atlanta, and Philadelphia have all tried using moving images during concerts, and some orchestras are resorting to gimmicks such as projecting works of art during performances of Mussorgsky's "Pictures at an Exhibition," or broadcasting images of space during Holst's "The Planets."

Television

- Impact of TV
  - Television glued us to our homes, isolating us from other human beings.
    - Except for teenagers and college students, people no longer went out at night to patronize the cafes, bars, theaters, amusement parks, concerts, or dance halls that pre-TV generations patronized
    - One result was that only one-quarter of all Americans know their next-door neighbors.
    - Depending on the methodology, the average American family watches 4 to 5 hours of TV a day.

Joel Swerdlow in a *National Geographic* article on the "Information Revolution" noted that the decline of human-to-human contact is apparent around the world. Throughout the Middle East, cafe life—where people used to tell stories over a cup of tea—is disappearing. Bistros are going out of business in Paris; many close earlier in the day. Henri Miquel, owner of Le Dufrenoy, shuts down at 8 p.m. instead of midnight. Where do patrons go? "They rush off to watch television," he says.

Television

- Fame and Celebrity
  - Changed the concept of celebrity
    - Celebrities are persons who are both well-known and visible via the mass media
    - Prior to the 20th century, people were celebrities because they were famous – they either occupied high office or had excelled in some field that made them known to the public – e.g. business, performing arts, sports, or writing

Television

- Fame and Celebrity
  - Changed the concept of celebrity – 2
    - With the invention of public relations and television, people become celebrities because they are visible in the media
      - Celebrities are known for their well-knownness
    - Because celebrity status reflects media (especially television) attention, celebrity status no longer is necessarily a result of fame or accomplishment
      - People now become celebrities simply by either media exposure or through some sort of link to a celebrity or celebrities

It might be added that celebrity status can be conferred on a person or a place, simply by having some sort of connection to a celebrity. Thus owners of restaurants frequented by Hollywood stars, hairdressers who have stars as customers, and divorce lawyers who have them as clients have become celebrities. Charles Manson became a celebrity by simply murdering such celebrities as actress Sharon Tate and Folger's Coffee heiress Abigail Folger. Monica Lewinsky became a celebrity simply by her illicit relationship with Bill Clinton. One guarantee of financial success for an Italian restaurant in New York City lies in having it publicly known that a Mafia godfather frequents that restaurant – it is even better publicity if a Mafia celebrity was gunned down in that restaurant. Umberto's Clam House in New York was on the verge of bankruptcy until mobster Joey Gallo was killed there; since then, it has done a land office business.

Television

- TV and News
  - Merged entertainment with news
    - The economics of TV production required a mass audience – this means they must be entertaining
    - TV was a visual medium with an affinity for action and suspense entertainment that had many hours to fill
    - News coverage increasingly focused on the dramatic as opposed to the intrinsically important
  - Created the "pseudo-event"
    - An event concocted for the purpose of gaining media attention

TV economics – Like the movies, television production is very costly with almost all the expenses being front-end loaded and the revenues from the sale of commercial time slots coming subsequently. In terms of production costs, there are no economies of scale. Program costs are the same whether everyone watches it or no one watches it, but the revenues from the sale of time slots to advertisers are very ratings sensitive. i.e. highly-watched programs command top dollar advertising – think of what the network can charge for a super bowl ad – while low ratings programs generate little ad revenue. Thus the imperative is that programs, even news programs, get high ratings. To do this, they must be entertaining as well as informative.

News as entertainment - Television, like the movies, was a visual medium with an affinity for sensational entertainment. But because in its early years it was live and because it had so many hours to fill, it also had an affinity for news. These affinities quickly meshed: a form of entertainment found the best means for its expression. Like film and the tabloids, television loved action and suspense, and it didn't matter whether this was provided by conventional entertainment or by reality.

Dramatic vs Important – As Neil Postman in his *Conscientious Objections. Stirring up trouble about language, technology, and education* notes, "Certain stories show up because they offer dramatic pictures. A plane crash makes a perfect television news story since cameras can record both the wreckage and the anguish and grief of the families of the victims. On the other hand, Congressional approval of a budget, while much more far-reaching in its effects, is much less dramatic and provides few visuals. If it makes the news, its more important provisions will be quickly summarized in a voice-over or splashed on the screen while a visual shows a telephone-sized book being brought to the White House."

Pseudo-event "If the primary effect of the media in the late 20th century was to turn nearly everything that passed across their screens into entertainment, the secondary and ultimately more significant effect was to force nearly everything to turn itself into entertainment in order to attract media attention." I.e. Events that ordinarily would not have happened were concocted by public relations practitioners and the publicity-conscious merely to get media attention -- e.g. movie premiers, press conferences,

Television

- TV and Politics
  - Changed the nature of political campaigns and politics
    - Before television, candidates required mediators to reach the electorate; with television, candidates could reach the electorate directly with political ads
    - The result was that political campaigns are now largely television commercials, often in the form of attack ads
    - Changed political conventions from decision-making entities that actually chose the presidential nominees to coronations of a nominee chosen long beforehand
    - Made debates a key element in the political campaign

Political mediators – Before television, candidates became known to the electorate by speaking to the party and party constituency group leaders and faithful who then via campaign literature and word-of-mouth informed the electorate and persuaded them to go out and vote. With television, candidates (including maverick politicians not linked to or beholden to political party leaders) could reach the electorate directly with political commercials.

Campaigns as TV commercials - Political campaigns are now conducted largely in the form of television commercials. Candidates forgo precision, complexity, and substance for the arts of show business: music, imagery, celebrities, theatrics. Indeed, political figures have become so good at doing commercials that they now do television commercials when they are not campaigning -- e.g. William Miller and Robert Dole for American Express, Robert Dole for Viagra, Geraldine Ferraro for Diet Pepsi, Tip O'Neill for Tourister Luggage. Political figures also now appear on variety shows, soap operas, and sitcoms -- George McGovern and Jesse Jackson have hosted *Saturday Night Live*, Gerald Ford did cameo roles on *Dynasty,* Tip O'Neill and Michael Dukakis have appeared on *Cheers.* Bill Clinton played the sax on *The Johnny Carson Show. During the last campaign, Barack Obama, John McCain, and Sarah Palin all appeared on Saturday Night Live*.

Television

- TV and Politics
  - Led entertainment and sports celebrities to go into politics and embrace political causes
  - Led discussion of policy decisions to focus less on their effects on the public and more on their effects on President's (and his party's) re-election chances
  - After Watergate, it led the tabloid media to cover politicians with the same salacious zeal with which entertainers were covered

Entertainers as politicians – Since television, entertainment and sports celebrities have often gone into politics -- Shirley Temple Black, Ronald Reagan, George Murphy, Sony Bono, Arnold Schwartznegger, Jim Bunning (AL pitcher) , Bill Bradley (NBA), Fred Gandy (Gopher on "The Love Boat"), Heath Shuler (Washington Redskin QB) and Al Franken. Lynn Swann (Pittsburgh Steeler Hall of Fame receiver) was a candidate for Governor of PA.
Policy discussions - the media (along with politicians and political commentators) focused discussions of policy not on their effects upon the public, which was boring, but on their effects upon the President's (and his party's) re-election chances which lent governance the drama of an on-going contest.
Tabloidization of politics - The final confirmation of how thoroughly political life had been transformed in the post-Reagan era was that the media started treating it exactly the way they treated any conventional entertainment. Standard tabloids were now as likely to feature the president in some lurid headline as an entertainer like Madonna. Meanwhile, supermarket tabloids began covering Washington with the same salacious zeal with which they covered Hollywood. After Watergate, coverage of the presidency was consumed with the disclosures of personal fallibility as politicians (and their families) were expected either to star in an elaborate *film noir* of corruption and/or sex scandal or to provide a manageably small cast for a national sitcom, soap opera, or docudrama.

Television

- TV and Sports
  - Increased the audience for sports by enabling those not present in the stadium or sports arena to see the sport and develop an interest in it
  - Created interest in previously unknown or little-known sports
    - Popularized many little-known Olympic sports, such as figure skating, speed skating, decathlon, beach volleyball, water polo, etc.

Television

- TV and Sports
  - Greatly popularized football
    - The once a week frequency of football made football both a habit and a special event – enough so that each game was important and an event to look forward to
    - Television made football easier to watch than in person
      - With its close-ups and slow-motion replay, it enabled the audience to more closely view the action
      - At stadiums with jumbotron screens, people characteristically watch the jumbotron rather than the field

Once a week events - In the course of the twentieth century television consum-mated marriages with all three team sports, but the match with football was an especially apt and rewarding one. Foot-ball is played during the winter, when cold weather keeps people indoors in many parts of the country, thereby widen-ing the pool of potential viewers. Because it takes time for players to recover from sixty minutes of collisions, a football team, unlike a baseball or basketball team, plays only once a week—the same frequency, as it happens, with which the programs in television comedy and drama series appear. The spacing has made football both a habit and a special event, something that happens often enough to sustain interest and provide continuity but infrequently enough so that each game is important and an event to which the audience looks forward during the days between one and next."

Making football actions visible – As Michael Mandelbaum in *The Meaning of Sports* notes: ""If football is, more than the other two team sports, made for television, television is also made for football. It makes the game easier to watch than it is in person. Because most of the action takes place far from where they are sitting, in the tangle of bodies that many plays produce, it is difficult for the spectator at the game to make out exactly what is happening. Television, with its close-up pictures and its slow-motion replays, can dissect the action and present each slice of it in a way that the naked eye cannot see. Some football stadiums include large mounted screens that show the audience at the game what the people viewing at home can see -- a tribute to the benefits that television confers on football. For this reason, and because many games are held outdoors in cold weather, football is the major American team in which the advantages of watching on television are most pronounced. It is also the one in which attendance at actual game has most to do with the rituals in which the spectators participate—socializing with friends, taking part in organized cheers, drinking—as distinct from the manifest purpose of attendance which is to watch the play on the field."

TV and the NFL - The first professional football game to be televised was played on October 22, 1939. In 1953, the NFL signed a contract with the DuMont television network to broadcast a set number of its games. In 1962, the team owners made the momentous decision to sell the rights to televise their games as a single package and to share the proceeds equally among themselves. This strengthened their bargaining position with the television networks and avoided the extreme disparity in revenues among the teams that produced many of the problems that came to plague

Television

- TV and Sports
  - Contributed to the decline in the popularity of baseball
    - Baseball is a one-thing-at-a-time game with the focus on the duel between pitcher and batter. In contrast, football, basketball, and ice hockey are games in which many events occur simultaneously with the entire team normally involved
      - Thus, baseball was well adapted to radio, where the announcer's verbal account and the listener's imagination could convey what was happening
      - Baseball did not come across as well on TV since its relative lack of action made the game seem boring and tedious

Television is superior to radio in conveying football, as is not the case for baseball. The reason is that in football many things happen at once and must be apprehended visually, whereas in baseball one things happens at a time and so the action can be conveyed orally." (p305 footnote 92} [Mandelbaum_The Meaning of Sports]

Just where to begin to examine the transformation of Amer-ican attitudes since TV is a most arbitrary affair, as can be seen in a change so great as the abrupt decline of baseball. The removal of the Brooklyn Dodgers to Los Angeles was a portent in itself. Baseball moved West in an attempt to retain an audience after TV struck. The characteristic mode of the baseball game is that it features one-thing-at-a-time. It is a lineal, expansive game which, like golf, is perfectly adapted to the outlook of an individualist and inner-directed society. Timing and waiting are of the essence, with the entire field in suspense waiting upon the performance of a single player. By contrast, football, basketball, and ice hockey are games in which many events occur simultaneously, with the entire team involved at the same time. With the advent of TV, such isolation of the individual performance as occurs in baseball became unacceptable. Interest in baseball declined, and its stars, quite as much as movie stars, found that fame had some very cramping dimensions. Baseball had been, like the movies, a hot medium featuring individual virtuosity and stellar performers. The real ball fan is a store of statistical information about previous explosions of batters and pitchers in numerous games. Nothing could indicate more clearly the peculiar satisfaction provided by a game that belonged to the industrial metropolis of ceaselessly exploding populations, stocks and bonds, and production and sales records. Baseball belonged to the age of the first onset of the hot press and the movie medium. It will always remain a symbol of the era of the hot mommas, jazz babies, of sheiks and shebas, of vamps and gold-diggers and the fast buck. Baseball, in a word, is a hot game that got cooled off in the new TV climate, as did most of the hot politicians and hot issues of the earlier decade

Television

- TV and childhood
  - Just as printing brought about the emergence of childhood as a separate social category, TV erased the distinction between childhood and adulthood
    - TV requires no instruction on how to watch it and it communicates the same information to everyone watching
    - TV erodes the idea that there are certain things that are not considered suitable for children to know until they reach a suitable level of maturity

Television erases the dividing line between childhood and adulthood in two ways. First, it requires no instruction to grasp its form, and it does not segregate its audience. It communicates the same information to everyone watching, regardless of sex, age, race, level of education, or social class. (p155) [Postman]

"One might say that the main difference between an adult and a child is that the adult knows about certain facets of life -- its mysteries, its contradictions, its violence, its tragedies -- that are not considered suitable for children to know. As children move to adulthood, we reveal these secrets to them in ways we believe they are prepared to manage. That is why there is such a thing as children's literature." Television makes the above arrangement impossible. It reveals all adult secrets -- social, sexual, physical, and the like. "Television forces the entire culture to come out of the closet; taps every existing taboo. Incest, divorce, promiscuity, corruption, adultery, sadism -- each is now merely a theme for a television show. And, of course, in the process, each loses its role as an exclusively adult secret**. ...** Television is relentless in both revealing and trivializing all things private and shameful. ***The subject matter of the confessional box and the psychiatrist's office is now in the public domain. ... [commercials] contribute toward opening to youth all the secrets that once were the province of adults, everything from vaginal sprays to life insurance to the causes of marital conflict. ... [news shows] daily provide the young with vivid images of adult failure and even madness***."

Television

- TV and childhood – 2
  - The result is that we are reverting to the medieval notion of seeing children as simply young adults
    - Dress distinctions that used to differentiate children from adults have largely vanished
    - There is an increasing tendency to try juvenile offenders in adult courts
    - The use of four-letter words in front of and by children

Postman goes on to say, ""However you wish to describe the transformation taking place, it is clear that the behavior, attitudes, desires, and even the physical appearance of adults and children are becoming indistinguishable" There no longer exists what we unambiguously recognize as children's clothing. Eleven-year olds wear three-piece suits or high heels to birthday parties; Fifty-two year olds wear jeans and sneakers to birthday parties. Little League baseball and Peewee football take on the organizational characteristics and emotional intensity of big-league sports. Junk food, one suited only for the undiscriminating palates and iron stomachs of the young, is now common fare for adults. The idea that there may be words that adults ought not to use in the presence of children now seems faintly ridiculous." As information technology moves us away from print, less information is kept private. Children experience sex and violence vicariously on TV and in their day to day lives. The age of sexual awareness is being lowered. At the same time need for increased education and life long has pushed up the age of student learning. Both trends are blurring the distinction between adult and child. Childhood is disappearing. Like before the press, children are beginning to be seen as small adults. Evidence of this is the tendency to try children in adult courts and the lack of distinction between adult and children's fashions.

Television

- Impact of Cable & Satellite TV
  - The multiplicity of channels changed TV from a broadcasting medium to a narrowcasting medium
    - Instead of three major networks offering similar-type programming, there were dozens of specialized channels that focus on topics that appeal to small audiences
  - All-news channels (like CNN, MSNBC, Fox News) did to network news departments what TV did to newspapers and news magazines
    - It ended their reign as news sources and led the networks to focus on entertaining features, news analysis, and news commentary

Narrowcasting – Thus, along with (and increasingly instead of) network channels that appealed to a mass audience, there were dozens of niche channels -- cartoon channels for children, instructional channels for schools, religious channels, history channels for history buffs, science channels for scientists, music channels for teenagers, plus movie and shopping channels.

All News Channels - CNN and MSNBC have done to network news departments what TV did to newspapers and news magazines like Time, Newsweek, and U.S. News & World Report -- it ended their reign as news sources and led them to focus on entertaining features, news analysis, and commentary

Xerography

- There is a historically significant distinction between *copies* and a *duplicates*
  - *Duplicates* – any of two or more things exactly alike and usually produced at the same time
  - *Copies* – 1: imitations, transcripts, or reproductions of an original work 2: one of a series of especially mechanical reproductions of an original impression

Copying - 1 : to make a copy or duplicate of "copy a document" "copy a computer file"2 : to model oneself on intransitive verb 1 : to make a copy 2 : to undergo copying "the document did not copy well" COPY suggests duplicating an original as nearly as possible "copied the painting and sold the fake as an original".
Duplicating - transitive verb 1 : to make double or twofold 2 a : to make a copy of *a cell duplicates itself when it divides* b : to produce something equal to *trying to duplicate last year's success* c : to do over or again often needlessly *duplicated effort* intransitive verb : to become duplicated;
Copy – From the Medieval Latin *copia* (abundance) 1 : an imitation, transcript, or reproduction of an original work (as a letter, a painting, a table, or a dress) 2 : one of a series of especially mechanical reproductions of an original impression; also : an individual example of such a reproduction3 archaic : something to be imitated : MODEL4 a : matter to be set especially for printing b : something considered printable or newsworthy — used without an article *remarks that make good copy — Norman Cousins* c : text especially of an advertisement5 : DUPLICATE 1a *a copy of a computer file* *a copy of a gene*synonyms see REPRODUCTION
Duplicate – From the Latin *duplicatus,* past participle of *duplicare* (to double) 1 a : either of two things exactly alike and usually produced at the same time or by the same process b : an additional copy of something (as a book or stamp) already in a collection2 : one that resembles or corresponds to another : COUNTERPART3 : two identical copies — used in the phrase in duplicatesynonyms see REPRODUCTION

Xerography

- People in the documents business distinguish between duplicators and copiers
  - Duplicators produce identical documents, of which none is truly the 'original'
    - With duplicators, there is always an intermediate phase – a woodblock, a form filled with metal type, or a lithographic plate – between the source text or imagery and the duplicates
    - Printing Press is a duplicator
  - Copiers make facsimiles of documents that already exist
    - Xerox machine is a copier

Xerography

- Until printing, the only way to reproduce a document was to write it out again
  - Copying was done by scribes
- With printing one could duplicate documents but not copy them
- In 1780, James Watt invented the copying press or letter press
  - Involved placing thin tissue type paper on the original via a press while the ink was still wet

As soon as people began to write with ink, the noticed that a reversed image of fresh handwriting could be made if a second sheet of paper was pressed against it while the ink was still wet. In the 1770s, James Watt, of steam engine fame, elevated that observation into a piece of office equipment. !! The copy press took a freshly-written document, placed a moistened sheet of translucent paper against the inked surface, and squeezed the two sheets together in a press, causing some of the ink from the original to penetrate the second sheet, which then could be read in its proper orientation by turning it over and looking through its backThis new capability was sharply limited because a copy press could only copy originals that had been written within the past few minutes and with a modified ink, and each original could be reproduced only a very limited number of times. Thus, like the printing press before it, the copy press failed to put scribes completely out of work. Many businesses and government agencies still related on copyist scribes to make handwritten copies of outgoing correspondence. In fact, the last president whose White House correspondence was copied on a copy press was Calvin Coolidge.

Xerography

- 1806 – Invention of carbon paper by Ralph Wedgwood, a relative of both Josiah Wedgwood and Charles Darwin
  - Flourished only after the invention of the typewriter
  - In conjunction with the typewriter, it made the copy or letter press obsolete
- 1874 – Eugenio de Zaccato invents the stencil

Zuccato's system involved writing on a sheet of varnished paper with caustic ink, which ate through the varnish and the paper fibers, leaving holes where the writing had been. This sheet -- now a stencil -- was placed on a blank sheet of paper and ink rolled over it so that the ink oozed through the holes, creating a duplicate on the second sheet. A year later, Thomas A. Edison introduced a stencil duplicating device of his own. !!

Xerography

- 1842 – Sir John F.W. Herschel invents the blueprint
- 1880s – Albert B. Dick and Thomas A. Edison invent the mimeograph
- 1906 – Beginning of photostat copying
- 1923 – Wilhelm Ritzerfeld invents the Ditto machine

Blue print - Blueprinting was invented in 1842 by Englishman Sir John F.W. Herschel and was used mainly to reproduce engineering and architectural drawings. It did not spread to the U.S. until 1876, when a Swiss exhibitor demonstrated it at the Philadelphia Centennial Exposition. To create a blueprint, the draftsman made a drawing on translucent paper. The paper was pressed in a frame against a sheet that had been treated with potassium Ferro cyanide and ferric citrate or similar photosensitive chemicals, and then the paired sheets were exposed to sunlight or a bright arc light. The exposure caused the treated paper to turn dark blue except where the dark lines of the original blocked the light. Blueprinting, however, had inherent limitations that made it all but useless for office copying work. It took forever; the original was often ruined since it was usually oiled to make it more translucent; and the chemicals had an horrendous smell.

Mimeograph - In the 1880s, Albert Blake Dick (also along with Thomas A. Edison) thought of placing a sheet of impervious paper (usually waxed) on top of a file-like metal plate and then 'writing' on the paper with a metal stylus in such a way that the sharp points on the plate perforated the sheet, which could then be used as a stencil. Dick called his new device a *mimeograph.* Edison Mimeographs sold well for decades -- by 1940, roughly half a million were in use in the U.S.

Photostat - The first photographic copying machine was built in 1906 by George Beidler, an Oklahoma City inventor, who called his machine a rectigraph. The key component was a camera the size of a kitchen stove with bellows for adjusting the focus. The process was a direct-to-paper photographic method with no intermediate negative, so that the copy was always the reverse of the original -- black type came out white while white background came out black. To create a copy that looked like the original, one had to make a copy of the first copy. Beidler soon attracted a competitor, the Photostat Corporation, which had a licensing and manufacturing relationship with Eastman Kodak. Making copies with either

Xerography – Scientific Basis

- Xerography is based on photo-electricity and photo-conductivity
  - A photo-conductive material is one whose ability to transmit electricity increases when it is illuminated
  - Selenium is a photoconductor that acts like an electrical insulator in the dark and an electrical conductor in the light

Xerography – Scientific Basis

- If you brightly illuminate the surface of an original document and then project the reflection onto the selenium, the selenium will retain a charge in areas where no light falls (where the ink is)
- If you then dust the selenium plate with a charged powdery resin
  - The resin makes the latent image visible in the form of a mirror image of the original
  - The resin is then transferred to a sheet of paper and melted to make a permanent copy in the form of a mirror image of the latent mirror image

"If you shine a light on a document in such a way that an image of the document is projected onto a charged selenium photoreceptor, the selenium coating will retain its charge in those areas where no light falls -- that is, in those areas that correspond to the dark ink on the document -- and lose it everywhere else. If you then sprinkle an oppositely charged powdered resin onto the selenium coating, the resin will stick to the areas where the charge remains, in the same way that house dust sticks to a staticky balloon. Doing so will produce on the surface of the selenium a visible mirror image of the original document. !! You can then transfer the resin to a sheet of paper and melt it, making a permanent copy." In a laser printer, the light that shines on the photoreceptor comes from a digitally-controlled laser or a fiber-optic array, but the other components and steps are the same.

Xerography - History

- Xerography was the product of Chester Carlson – a patent attorney
  - Carlson conceived the concept in 1937 after reading a technical journal in the New York City Public Library
- In 1944, two key events:
  - Carlson visited the Batelle Institute in Columbus OH to successfully gain backing
  - A New York freelance writer wrote an article about Carlson and his invention which appeared in *Radio News* and later in an Eastman Kodak technical bulletin
    - John Dessauer of the Haloid Company read the bulletin and persuaded President Joseph C. Wilson to visit Batelle and meet with Carlson

In 1944, a New York City patent attorney and freelance writer named Nicholas Langer came across a copy of one of Carlson's patents. He thought Carlson's idea might make a good story so he sent Carlson a letter, interviewed him at length, and wrote a laudatory article which was published as a technical supplement to a magazine called *Radio News* a publication aimed at radio scientists and engineers. Eight months later, a condensed version appeared in a monthly technical bulletin published by Eastman Kodak. The bulletin -- containing abstracts of articles from a variety of scientific publications -- was intended to keep Koday employees informed about developments in fields related to photography; but its readers included non-Kodak scientists as well. Among them was John Dessauer, then chief of research at Haloid Company, a competing photographic paper manufacturer, also located in Rochester, that in 1935 had purchased the Rectigraph Company.
Dessauer showed the article to Haloid's president, Joseph C. Wilson. When Wilson read it, he was interested immediately. Haloid, through its Rectigraph division, already built document-copying machines, so the move would be a logical extension of part of its existing business. Also, if Haloid could turn electro photography into a viable product, the company would have a chance to establish itself in an industry that wasn't already dominated by Kodak.

Xerography - History

- In 1946, Battelle and Haloid reached an agreement
  - Batelle would research the fundamental process and Haloid would research the treated paper part of the process and manufacture the copying machine, paying Battelle an 8% royalty on any sales
- In 1958, IBM hired Arthur D. Little to assess the market for a copier like the Xerox 914
  - The conclusion: "The model 914 has no future in the office copying market"
    - The nation's businesses already had carbon paper, photographic processes for ordinary copying, and offset printing and ditto machines for high-volume reproduction.
    - Office workers would have no interest in carrying documents to a central copying room in order to reproduce them and the projected $2,000 cost was frighteningly high.

Arthur D. Little - In 1958, IBM hired the Boston consulting firm of Arthur D. Little to assess the potential market for a copier like the Xerox 914. Haloid Xerox cooperated with the study and allowed the consultants to speak with its employees. It even shared the specifications for the 914 and for a smaller copier, called the 813, which Haloid hoped would follow the 914 to market. The consultants' conclusion was unequivocal. They wrote: "Model 914 has no future in the office copying market." The nation's businesses already had carbon paper and inexpensive desktop devices like Thermo-Fax and Verifax for ordinary copying, and they had offset printing, spirit duplicating, and other well-tested technologies for high-volume reproduction. Office workers, in field interviews, had expressed little interest in the Haloid Xerox concept and no interest at all in carrying documents to a centralized copying room in order to reproduce them. The 914 didn't exist yet, but the niche it was meant to occupy was already vanishing and its projected cost, roughly $2,000, was frighteningly high. The report concluded that total demand, now and in the future, would be only a few thousand machines at a maximum -- not enough to make production worthwhile. Arthur D. Little urged IBM to 'terminate consideration of the 914 as a new market opportunity.' And that is what IBM did.

Haloid – In contrast to Arthur D. Little, Haloid's salesmen asked customers how much special paper they bought for the existing non-xerographic copiers. In Philadelphia, one of the salesmen dropped by the local Social Security office, which used one of the coated-paper machines. When asked how much coated-paper do you use, the respondent said, 'What do you mean -- how many carloads, or what?' The Haloid salesman's eyes lit up. 'Carloads?' Thus, the information was out there, dispersed among many potential customers but it wasn't easy to gather unless you asked the right people the right questions.

Xerography – History

- 1960 – Haloid started marketing its first Xerography machine – the 914
  - Haloid anticipated they would sell 3,000 machines; they sold over 200,000
- In 1959, Haloid was just the 12th largest company in Rochester NY. By 1972, the Xerox Corporation was the 15th largest publicly owned company in America
  - Larger than RCA, Bell & Howell, Chrysler, U.S. Steel, and close to IBM

Donald Clark responsible for marketing the 914, said later: 'The first thing you have to recognize is that copying at that state of the game was an inherent, unrecognized need. Once you got the 914 in the office, the narcotic effect began. The biggest problem our customer had was not with us. The problem was with their own employees, to stop them from abusing the privilege of having that machine there.

Xerography – Effects

- Effects of the Xerox machine
  - In the words of Marshall McLuhan, it made everyman a publisher
  - Threatened the livelihood of commercial publishers and authors since it was now easy and cheap to make copies
    - Educators began xeroxing articles and chapters of books rather than having student buy them
  - Greatly decreased the demand for carbon paper
  - Made the mimeograph, photostat, and ditto machine obsolete

Xerography – Effects

- Effects of the Xerox machine
  - Led to the laser printer
    - Invented in 1969 by a Xerox researcher
  - Led people in the office to:
    - Copy documents for everyone in the office rather than attach a routing slip to a single incoming copy that could only be read sequentially
    - Give each meeting attendee a copy of the agenda rather than posting the agenda on a bulletin board
    - Create copies of office documents and reports for personal reference files
    - Assume they had a natural and constitutional right to use the machine to make personal copies

In the course of my Federal career, I saw people use the office copier to copy their income tax returns, MA theses, PhD dissertations, college term papers, newspaper articles, magazine articles, journal articles, and newspaper cartoons.

Xerography – Effects

- Effects of the Xerox machine
  - Led researchers in libraries to copy pages out of books and journals rather than make handwritten notes
  - Led researchers in archives to xerox documents rather than write out note cards

Xerography – Effects

- Effects of the Xerox machine
  - Greatly weakened the ability of governments to monopolize and limit the dissemination of knowledge
    - Stepan Pachikov – "Many can claim the laurels of the destroyer of communism, especially Xerox"
      - Despite attempts to control access to and use of the Xerox machine, great amounts of *The Gulag Archipelago, 1984, Animal Farm,* and other anti-Soviet literature were duplicated. In the words of Pachikov, "No Xerox machine was ever out of work."

Xerography – Effects

- Effects of the Xerox machine
  - Eroded the ability of governments to keep secrets and to protect the informational content of security classified documents since it became possible to steal (and disseminate) the information without stealing the original document
    - Daniel Ellsberg and the Pentagon Papers

In the days of carbon paper, it was very easy to keep a document secret because only one or an original and a handful of carbons would be created and the document could not otherwise be duplicated. With the Xerox machine, it became possible to copy documents, but this still required access to a Xerox machine and the documents themselves were still bulky which hampered the sneaking of a large number of documents outside of the office. With floppy discs and Zip drives, it becomes very easy to download massive numbers of documents and sneak the easily concealable disc outside the office.
The xerox machine enabled Ellsberg to copy the voluminous Pentagon Papers and disseminate them to the *New York Times* and the *Washington Post.* The publication of the Pentagon Papers in turn led to the creation of the Plumbers, the burglary of the office of Daniel Ellsberg's psychiatrist, and the criminal activities and scandals associated with Watergate. Watergate in turn led to the forced resignation of President Richard Nixon and, for which one could make the case, the fall of South Vietnam to the Viet Cong and North Vietnamese in 1975 – Nixon had promised South Vietnamese President Thieu that the U.S. would intervene if the North Vietnamese violated the 1973 Paris Peace Agreement. With Nixon crippled by the Watergate scandal and fighting to avoid impeachment, he was in no position to honor his promise to Thieu, a promise he could have conceivably honored if Watergate had not happened, the Watergate burglars not caught, or the scandal successfully covered up.

Xerography – Effects

- Effects of the Xerox machine
  - Vastly increased the information and paper flow within and between organizations
  - Led to the decline of central organizational files as individuals and subordinate organizations began to create their own reference files
  - Decreased the demand for carbon paper
  - Made the mimeograph, stencil, photostat, and ditto machine obsolete

Computers

- Computers have gone through four major computer ages – each of which differed in their basic technology and capabilities
  - 1st Computer Age – 1940-56: Vacuum Tubes
    - Used vacuum tubes for circuitry and magnetic drums for memory
    - Very expensive and took up large rooms
    - Programmed in machine language
    - Input was on punch cards and paper tape
    - Output displayed on printouts
    - UNIVAC and ENIAC

Computers

– 2nd Computer Age – 1956-1963: Transistors
  - Used transistors for circuitry and magnetic core for memory
  - Programmed in assembly language and early versions of COBOL and FORTRAN
  - Input and output as in 1st Computer Age
  - IBM 1401

Computers

– 3rd Computer Age – 1964-1971 Integrated Circuits
  - Used integrated circuits (small transistors on silicon chips) for circuitry
  - Users interact via keyboard and monitor
  - Users interfaced with an operating system which allowed the computer to run different applications at one time
  - IBM 360 series & 370 series

Computers

– 4th Computer Age – 1971-1991: Microprocessors
  - Large and ever-increasing number of integrated circuits built onto a single silicon chip
    – The Intel 4004 chip (1971) located the CPU, memory, and input/output controls on a single chip
  - 4th Computer Age computers went through multiple sub-Computer Ages in which each Computer Age of microprocessors (8008, 286, 386, 486, Pentium, Pentium II, etc) greatly expanded the memory, speed, or capabilities of the computer that contained them and reduced both the size and especially the cost of the computer

Computers

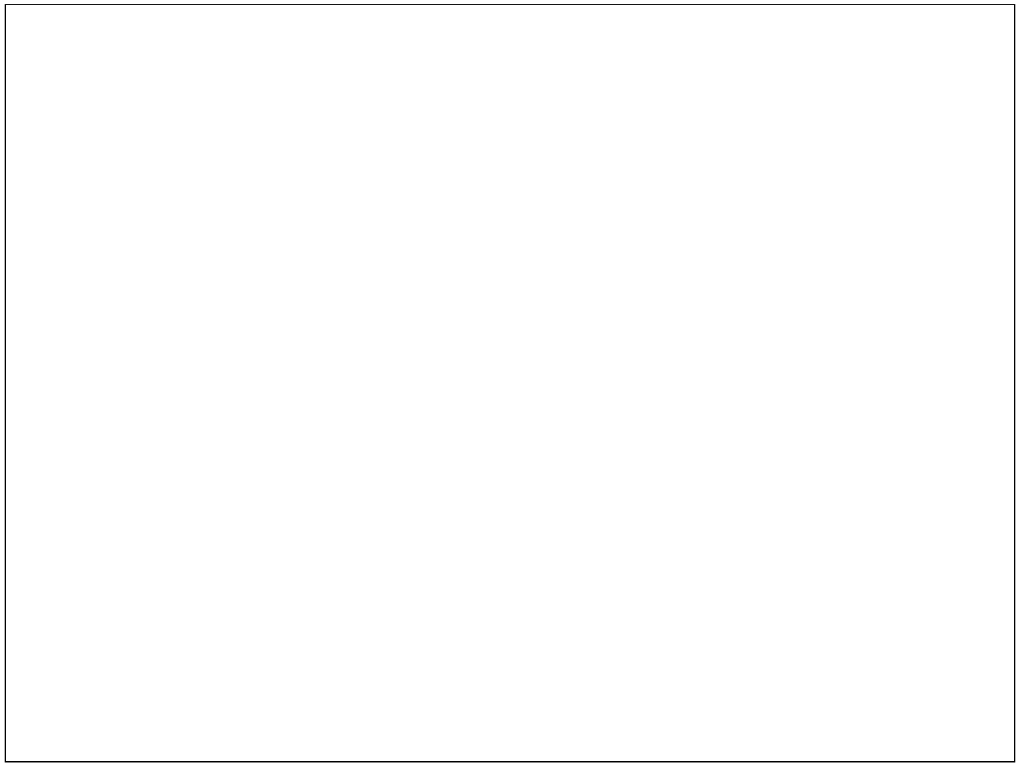
- 5th Computer Age – 1991 – present: Internet
  - Desktop and laptop PCs, home modems, and the World Wide Web
  - Graphical User Interfaces
  - Web browsing software
    - 1993 – Mosaic
    - 1994 – Netscape Navigator 1.0
    - 1996 – Internet Explorer 3.0
  - Beginnings of e-Commerce & e-Government
  - Internet both a broadcasting (websites & streaming video) and narrowcasting (e-mail) medium

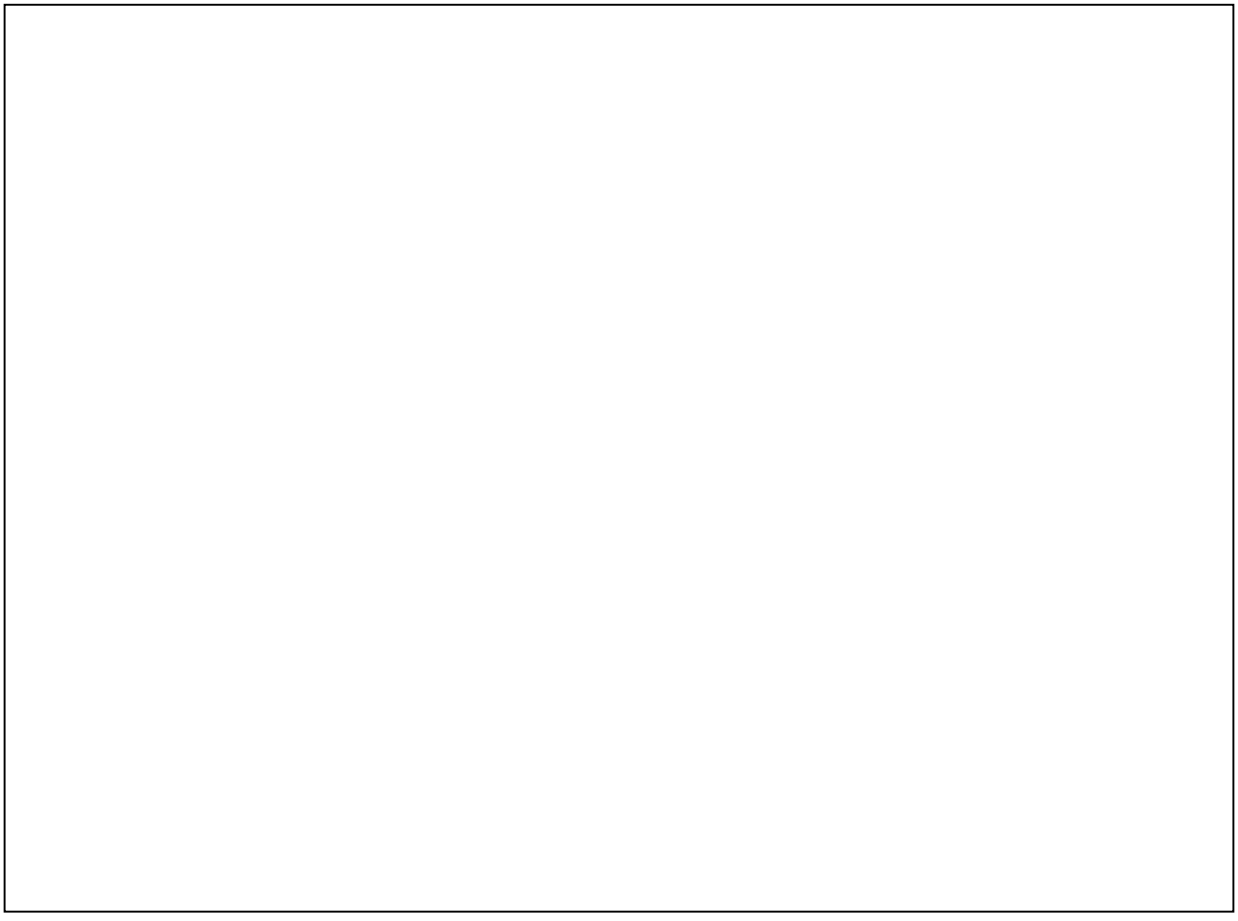
Computers

- Each Computer Age has had a differential impact on society
  - The first two Computer Ages of computers had limited impact on society because of their limited capabilities, large size, high expense, and inability to communicate
    - Resided in large corporate and governmental entities where they handled tabulation and payroll functions

Computers

- The third Computer Age had a little more of an impact because it did have some limited communication with dumb terminals
  - This had impact on such areas as travel reservations, remote data input and output, and banking transactions
- The fourth Computer Age had an ever-increasing impact as microprocessing capability increased, costs decreased, and increasing numbers of people acquired computers





Internet as the 5th Computer Age

– 5th Computer Age – 1991 – present: Internet
  - Desktop and laptop PCs, home modems, and the World Wide Web
  - Graphical User Interfaces
  - Web browsing software
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Internet

- Each Computer Age has had a differential impact on society
  - It is the Internet, however, that made the PC such a revolutionary technology
    - Made the PC part of worldwide network
    - Made possible the near-real-time dissemination of text, audio, still imagery, and video
    - Allowed any PC or computer to communicate with any other computer regardless of platform

Internet

- Origins of the Internet - 1
  - 1958 – Creation of the Defense Advanced Research Projects Agency (DARPA)
  - Internet grew out of DARPA's attempt to link DoD and contractor computers into a network so that information could be easily shared
    - This led to the creation of the ARPANET
      - Grew from 4 computers in 1969 to nearly 2,000 in 1985

Internet

- Origins of the Internet - 2
  - 1985 – Funding of the network was assumed by the National Science Foundation and the name changed to the INTERNET
  - 1989 – The NSF abandoned its support of the net and allowed commercial Internet service providers (ISPs) to offer Internet access to paying customers
    - By 1995, the Net encompassed 44,000 local networks, 160 countries, and an estimated 50 million users

Internet

- Origins of the Internet – 3
  - 1989 – Tim Berners-Lee of CERN developed three breakthrough techniques that made possible the World Wide Web
    - Hypertext Markup Language (HTML) – to format and layout pages of text on the Internet
    - Hypertext Transfer Protocol (HTTP) – a system to link documents
    - Uniform Resource Locators (URLs) – a scheme to address and thereby locate specific nodes of information

Internet

- Origins of the Internet – 4
  - 1993 – Development of Mosaic – the first web browser by Marc Andriessen
  - 1994 – Development of Netscape Navigator – an upgraded version of Mosaic
  - 1996 – Development of Internet Explorer 3.0 by Microsoft

Mosaic & Navigator - The development of Mosaic led to the creation of Netscape in 1994 -- an event which took Microsoft by surprise. Founded by Marc Andreessen and Jim Clark, founder of Silicon Graphics, Netscape was a classic Hi-tech startup. It had no money, no reputation, and one truly ingenious product -- the web browser formerly known as Mosaic but modified and renamed as Netscape Navigator in December 1994. Within a year, Netscape was worth $7 Billion. !! By April 1995, the company had distributed 6,000,000 copies of Netscape Navigator and had captured 75% of the exploding Internet market. The following year, its market share hit 90% with revenues of $346,000,000.

Internet Explorer - By this time, Microsoft began to take notice. On December 7, 1995, Bill Gates convened an all-day meeting of analysts, journalists, and leading Microsoft customers and announced that the company would do whatever it took to dominate the Internet market. Gates announced that Microsoft would make web browsers and web servers an integral part of its business and would distribute all of its web browsers and Internet services for free. In February 1996, Microsoft created an Internet Platform and Tools Division -- a 2500 person group charged with developing net products. By 1996, they had developed Internet Explorer 3.0 -- a browser that had the look and feel of Netscape Navigator. !! As one senior Microsoft executive noted, 'The current path is to copy everything that Netscape does.' Microsoft then announced plans to integrate Explorer into all future versions of Windows and develop its own cache of online content. When Microsoft's attempts to gain control of Netscape failed, Microsoft threatened to revoke the licenses giving computer manufacturers the right to use Microsoft software if the manufacturers replaced Explorer with Netscape Navigator. In other words, Microsoft wanted to make its browser the industry standard and wipe Netscape off the map.

Internet

- Some Effects of the Internet
  - Made anyone with Internet access both a potential publisher and broadcaster
  - Changed how people access and get information
    - Enabled people to obtain information not available in most news media outlets or libraries
    - Enabled people to seek out controversial issues and topics that are ignored by the mass media
      - Abolished information gatekeepers
  - Fostered the rapid circulation of information, rumors, and misinformation

Publisher & broadcaster – In the words of Charles Jonscher in his *The Evolution of Wired Life, ""*The Net has removed the asymmetry, the yawning divide, between producer and consumer, and this is indeed a completely unprecedented feature in any mass !! medium. On the World Wide Web each of us can be a publisher and a broadcaster as well as a reader and a viewer All Internet subscribers who take the trouble to put a page up on their website, whether a political manifesto or just a smiling passport photograph to let the world know what they look like, are publishers with a global reach of millions of readers."
Information Gatekeepers - Up until a decade ago, news-magazine editors and nightly news producers were information gatekeepers whose decisions strongly influenced what viewers could see and hear. Viewers now can seek out controversial images on the Internet even if mainstream news outlets avoid them. Now, there is 'a moral vacuum as the feeds go online,' says Jonathan Zittrain, an assistant professor at Harvard Law School. 'It has diluted somewhat the agenda setting power of the mainstream media.'
Rumors – As Thomas Friedman notes, "At its best, the Internet can educate more people faster than any media tool we've ever had. At its worst, it can make people dumber faster than any media tool we've ever had. The lie that 4,000 Jews were warned not to go into the World Trade Center on Sept. 11 was spread entirely over the Internet and is now thoroughly believed in the Muslim world. Because the Internet has an aura of ''technology'' surrounding it, the uneducated believe information from it even more. They don't realize that the Internet, at its ugliest, is just an open sewer: an electronic conduit for untreated, unfiltered information. "

Internet

- Some Effects of the Internet
  - Facilitated political mobilization
    - Enabled narrow coalitions and interest groups to use the Internet to find and mobilize sympathizers via targeted websites and email responses
  - Enhanced the power of small sub-groups (such as dissenters or terrorists) vis-à-vis the State
    - Such groups can use the Web to obtain critical information, mount propaganda campaigns, solicit funds, recruit new members, and plan and coordinate actions

Political mobilization - It was a purely volunteer effort by the International Committee to Ban Land Mines, organized primarily over the Internet, that drove the treaty to ban land mines. Another purely volunteer effort created Linux as an alternative operating system to Microsoft. A volunteer effort organized over the Internet built the coalition of anti-globalization activists that shut down the WTO meeting in Seattle in 2001. Real-world conflicts such as the [Danish] cartoons controversy almost instantly echo in cyberspace. … E-mails, blogs, and text messages have been used to press a boycott of Danish goods in Arab countries and a 'Buy Danish' campaign in the United States.

Vis-à-vis the State - The *Liberation Tigers of Tamil Eelam (LTTE)* in Sri Lanka are a potentially dramatic example of how modern technologies can sharply boost the power of destructive sub-groups relative to the state. !! The LTTE uses the Internet to support a world-wide state-of-the-art propaganda campaign and to organize the extraction of tens of millions of dollars from the Tamil diaspora. The LTTE pioneered in the battlefield use of off-the-shelf civilian technologies -- use of night vision glasses (to facilitate night operations), GPS signals (to accurately target projectiles), and satellite phones (to link organizational leaders with their combatants in the field, their overseas cadres, and their deep sea supply fleet of freighters). Modern insurgent groups are beginning to operate with a global reach just like multinational firms and government intelligence agencies

Internet

- Some Effects of the Internet
  - Created bonds between ordinary citizens of different states
  - Enabled formerly local markets to become national and even international markets by
    - Diminishing the costs of acquiring needed market information
    - Allowing auction sites such as e-Bay to turn local flea markets into a worldwide community of potential buyers and sellers

Citizens of different states - For the first time in history, it is easy for average residents of one state to develop strong interests and common bonds with those of other states." Thus, a member of Greenpeace in the American northwest may have more in common with another Greenpeace member in Germany than with the logger who lives next door. Using email, web sites, and inexpensive long distance, they may actually communicate more often with each other than with t
heir neighbors.

Local to international markets - Information is essential for a market to expand in scope. Sellers must be able to identify potential customers and persuade them to try their products. Sellers must also be able to communicate with, and monitor the behavior of, their agents in remote parts of the distribution chain. Buyers, for their part, need some way to identify the product that best suits their needs. They must also feel confident that the local sales agent can speak and act on behalf of the manufacturer. Even if transport costs were zero, markets could remain highly localized unless buyers and sellers had some means of accomplishing the above tasks. The global communications revolution has given buyers and sellers the necessary means.

Internet

- Some Effects of the Internet
  - Ended the economics that result from poor matching of supply and demand
    - Poor matching of supply and demand reflected the limited shelf space for storing physical media, the few channels available for broadcasting, and the need for a local audience or market
    - The Internet and virtual stores like Rhapsody and Amazon.com make it profitable to sell long-tail items

.Wal-Mart must sell at least 100,000 copies of a CD to cover its retail overhead and make a sufficient profit; less than 1 percent of CDs do that kind of volume. What about the 60,000 people who would like to buy the latest Fountains of Wayne or Crystal Method album, or any other nonmainstream fare? They have to go somewhere else. Bookstores, the megaplex, radio, and network TV can be equally demanding. We equate mass market with quality and demand, when in fact it often just represents familiarity, savvy advertising, and broad if somewhat shallow appeal. What do we really want? We're only just discovering, but it clearly starts with ***more.*** **To get** a sense of our true taste, unfiltered by the economics of scarcity, look at Rhapsody, a subscription-based streaming music service (owned by RealNetworks) that currently offers more than 735,000 tracks.¶ Chart Rhapsody's monthly statistics and you get a "power law" demand curve that looks much like any record store's, with huge appeal for the top tracks, tailing off quickly for less popular ones. But a really interesting thing happens once you dig below the top 40,000 tracks, which is about the amount of the fluid inventory (the albums carried that will eventually be sold) of the average real-world record store. Here, the Wal-Marts of the world go to zero - either they don't carry any more CDs, or the few potential local takers for such fringy fare never find it or never even enter the store. The Rhapsody demand, however, keeps going. Not only is every one of Rhapsody's top 100,000 tracks streamed at least once each month, the same is true for its top 200,000, top 300,000, and top 400,000. As fast as Rhapsody adds tracks to its library, those songs find an audience, even if it's just a few people a month, somewhere in the country. **The large market is for items not in the supply chain.** What's really amazing about the Long Tail is the sheer size of it. Combine enough nonhits on the Long Tail and you've got a market bigger than the hits. Take books: The average Barnes & Noble carries 130,000 titles. Yet more than half of Amazon's book sales come from ***outside*** its top 130,000 titles. Consider the implication: If the Amazon statistics are any guide, the market for books that are not even sold in the average bookstore is larger than the market for those that are. The average Blockbuster carries fewer than 3,000 DVDs. Yet a fifth of Netflix rentals are outside its top 3,000 titles. Rhapsody streams more songs each month ***beyond*** its top 10,000 than it does its top 10,000. In each case, the market that lies outside the reach of the physical retailer is big and getting bigger.

An average movie theater will not show a film unless it can attract at least 1,500 people over a two-week run; that's essentially the rent for a screen. An average record store needs to sell at least two copies of a CD per year to make it worth carrying; that's the rent for a half inch of shelf space. And so on for DVD rental shops, videogame stores, booksellers, and newsstands. In each case, retailers

Internet

- Some Effects of the Internet
  - Allowed the reader to intervene in the text of a book or article by:
    - Altering the visible format of the text
    - Linking to related information (such as a definition, a picture of an object, an extended discussion of a point, or a related subject) in other texts
    - Making annotations and comments on the text
  - Brought the incipit back to life in the form of the URL
  - It thus returned printed text to the status of the Medieval manuscript

Internet

- Some Effects of the Internet
  - Led to the migration of intellectual content from the printed page to the web
    - Many academic journals and other publications are now published only online
    - Many publications now have an online as well as a printed version
      - News magazines such as *Time* and *Newsweek*
      - Newspapers such as the *New York Times, Washington Post,* and *Los Angeles Times*

Internet

- Some Effects of the Internet
  - Allowed banks to replace tellers with online banking and automated teller machines
  - Allowed people to purchase airline tickets and books online
    - Hurt brick-and-mortar bookstores
    - Drove travel agents out of business by allowing people to book their own trips
  - Replaced the newspaper ad with online ads at Craigslist, eBay, and other similar websites

Internet

- Some Effects of the Internet
  - Fostered Exhibitionism
    - Allowed people to turn their lives via camcorders and the Internet into web spectacles
  - Allowed people to assume virtual identities
  - Facilitated access to Pornography
    - Porn pioneered the use of streaming video, Java-based methods of video transmission, and encryption for secure credit card purchases
    - Accelerated the decline of sex magazines

Exhibitionism - If anything, the Internet was even more accommodating than the video camera to life movie performers. Exhibitionists converted their lives into entertainment and placed themselves on the other side of the glass by mounting camcorders on their PCs that recorded their every move. Anyone who logged onto the site could then view the on-going drama or lack thereof in the individual's daily existence. I.e. Life the TV show.
Virtual identities - Individuals could log onto chat rooms or interactive games and construct their identities and write their plots from whole cloth, creating virtual lives.
Pornographers – According to Eric Schlosser in his *Reefer Madness. Sex, drugs, and cheap labor in the American black market,* "The distribution of pornography through the Internet has indeed soared in recent years. Porn has once again been at the forefront of technological innovation, pioneering the use of streaming video, Java-based methods of transmitting footage, and encryption for secure credit card purchases via the Internet.!! Americans now spend about $1 billion a year for online pornography. Surfing the Web to view explicit images or to chat about sex with strangers has become a daily routine for millions. In 2000 a survey found that 31.9 percent of the nation's men and 10.5 percent of its women had visited a sexually ori-pnted Web site. That same year, a poll conducted by *Christianity Today* magazine found that 27 percent of America's pastors sought out porn on the Internet."
Decline of sex magazines - "Easy and discreet access to pornography online has accelerated the decline of sex magazines. Nude photographs on the printed page now seem woefully obsolete. *Penthouse* is teetering on the verge of bank-ruptcy. *Playboy* is losing money, and *Hustler's* circulation dropped steadily in the 1990s.