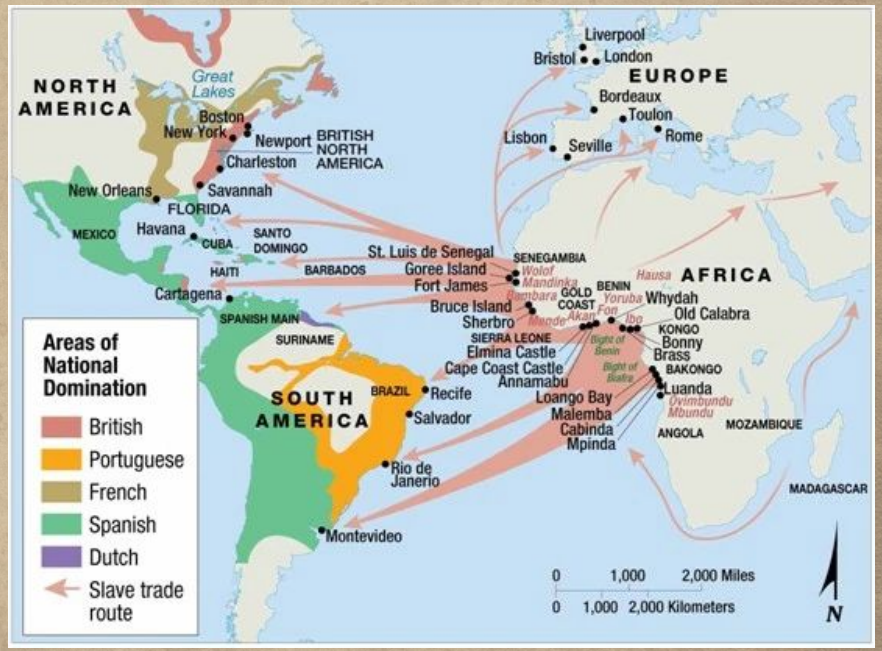
Section 2

From the Industrial Age to the Information Age

From the Industrial Age to the Information Age

In 1444, while Johannes Gutenberg was developing his printing press, Portuguese traders transported the first large number of enslaved Africans across the Atlantic

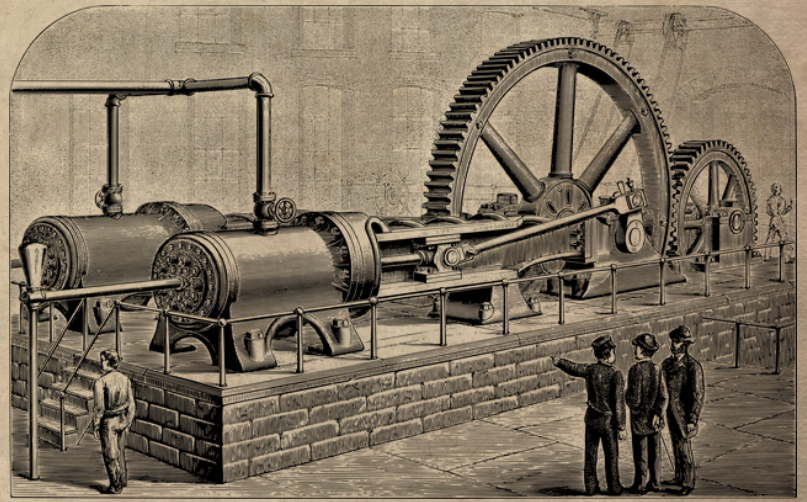
- The Transatlantic Slave trade was the engine that fueled exponential growth in Europe over the next 400 years
  - The profits from the enslavement, transportation, sale and financing of kidnapped Africans allowed financial institutions to invest in and expand the industries and countries that were benefiting from the slave trade
  - Raw materials and goods like sugar and cotton accumulated via cheap slave labor were exported back to Europe from their colonies, financing the growth of trade, manufacturing and industry



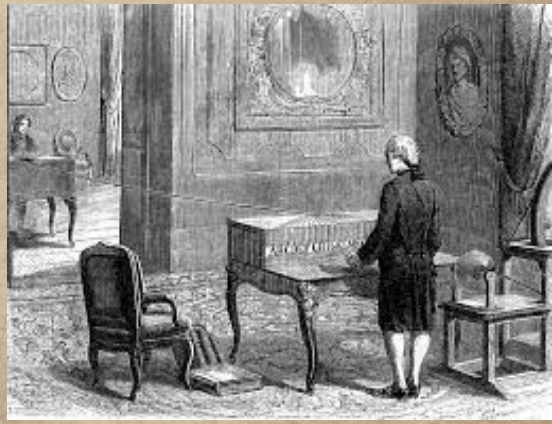
From the Industrial Age to the Information Age

The wealth from the slavery plantations in America helped to create the conditions for the Industrial Revolution in England

- The steam engine was first developed in 1698 to pump water out mines in England
  - As the need for skilled factory workers, craftsmen, and mechanical engineers increased, so did the need for more powerful steam engines
  - Profits from the slave trade were used to finance the devlopment of James Watts' steam engine, which was fundamental to the industrialization of Europe and the Americas

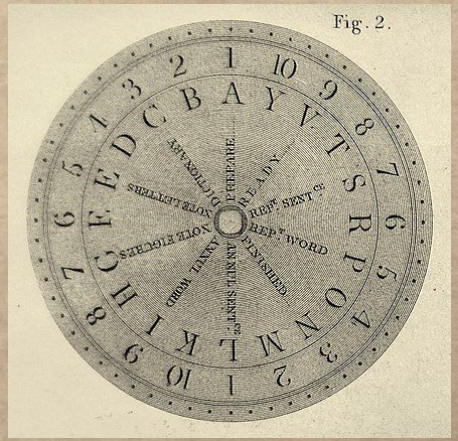


From the Industrial Age to the Information Age



The first electric telegraph is invented in 1774 by George Louis Lesage in France

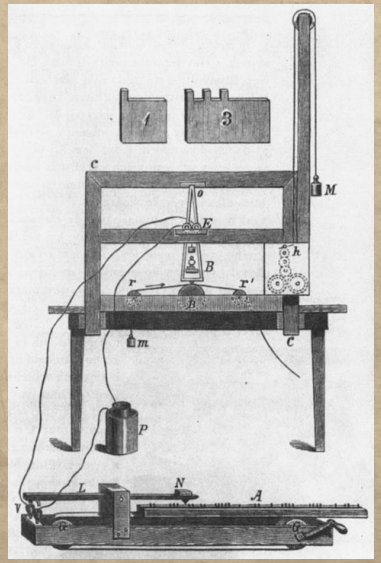
- This early telegraph had a separate wire for each of the 26 letters of the alphabet and its range was only between two rooms of his home
- The first working telegraph is invented by Francis Ronalds in 1816 in England and could transmit signals up to 8 miles



From the Industrial Age to the Information Age

Samuel Morse and Alfred Vail independently developed and patented a recording electric telegraph in 1837

- While most of the telegraphs of this time were multiwire, Morse and Alfred's was a single-wire telegraph
  - This is the first system to use Morse Code
  - The first telegram in the United States was sent by Morse on 11 January 1838



From the Industrial Age to the Information Age

The ability to mechanically reproduce images and sounds rapidly expands during the 1800s

- Four key audio/visual technologies that are developed during this time
    - Telephone- invented by Alexander Graham Bell 1876
    - Phonograph- invented by Thomas Alva Edison 1877
    - Photographic Film- invented by George Eastman 1885
    - Radio- invented by Guglielmo Marconi 1894

From the Industrial Age to the Information Age

The telephone is invented in 1876 by Alexander Graham Bell

- The device revolutionized communication and commerce, allowing people to communicate instantly over long distances rather than having to rely on letters
  - The first successfully communicated sentence over a telephone was "Mr. Watson, come here, I want to see you."
  - First “long distance” call is made in August of 1876 between Brantford and Paris, Ontario Canada. The range was 8 miles.

From the Industrial Age to the Information Age

The phonograph is invented in 1877 by Thomas Edison

- Also called a gramophone, record player, or turntable, the early versions of the device used waxed paper to record and playback sounds
  - It's the first time people hear recorded sound
  - It worked by using one needle to record the sounds onto a cylinder with tin foil. A second needle was then used to replay the sounds via the phonograph.
  - The first song recorded and played on the phonograph was the nursery rhyme "Mary Had a Little Lamb"

From the Industrial Age to the Information Age

From the Industrial Age to the Information Age

1st Motion Picture: The Horse in Motion | Eadweard Muybridge - 1878

From the Industrial Age to the Information Age

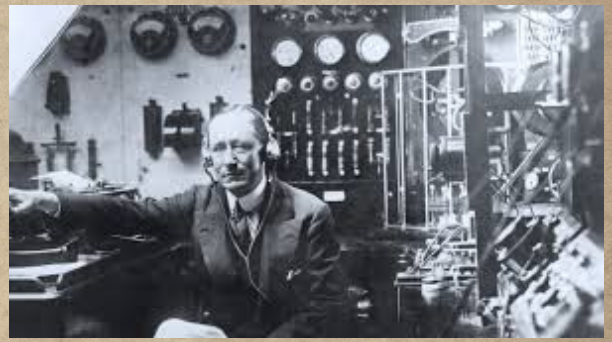
Photographic film is invented in 1885 by George Eastman

- Earlier devices such as the camera obscura and daguerreotype used metal plates or paper coated in iodine or silver chloride
    - Eastman developed dry gel on paper, or film, to replace the photographic plate so that photographers no longer needed to carry boxes of plates and toxic chemicals around
    - Eastman's invention resulted in photography being available for the mass market by 1901
    - Produced in 1888 by French artist and inventor Louis Le Prince, Roundhay Garden Scene is the first ever motion picture recorded on Eastman's photographic film

From the Industrial Age to the Information Age

Radio is invented in 1894 by Guglielmo Marconi

- Marconi demonstrated his first radio transceiver in 1894 to his mother which was able to ring a bell on the other side of the room
  - By the summer of 1895 Marconi was able to send morse code messages up to two miles
  - He received a British patent in 1897 for a wireless telegraph, becoming the first patent for radio wave communication technology
  - The first demonstration in the US is in 1899
  - The first transatlantic radio transmission was in 1901



From the Industrial Age to the Information Age

The time period between the 1920s and 1950s is known as the Golden Age of Radio

- The 4/12/1912 Titanic disaster highlighted the need for reliable communication at sea, leading to the establishment of regulations mandating continuous radio watches on ships.
    - These regulations, along with advancements in radio technology, contributed to the growth of radio broadcasting as a popular form of entertainment and news dissemination.

    - The Golden Age of Radio, from the 1920s to the 1950s, saw radio become the dominant form of mass communication, with the development of programming formats like variety shows and dramas.

From the Industrial Age to the Information Age

The development of electronic television systems in the late 1920s and early 1930s laid the foundation for modern television broadcasting, influencing the evolution of digital media and streaming services

- First television- invented by John Logie Baird in 1920
- First commercial radio station- KDKA in Pittsburgh in 1920
- First tv transmission- by Philo Farnsworth in 1927
- First commercial tv station- WRGB in 1928
- First cable tv system- Community Antenna TV in late 1940s

From the Industrial Age to the Information Age

During this same time, motion pictures transition from silent films to the introduction of sound in films

Silent films reach their peak popularity in the 1920s, with iconic stars like Charlie Chaplin and Buster Keaton

- In the late 1920s the first successful sound film, "The Jazz Singer," is released
- During the 1930s the transition to sound becomes complete, leading to the decline of silent films

From the Industrial Age to the Information Age

From the Industrial Age to the Information Age

The impact of World War II halted television production temporarily but paved the way for its post-war expansion, highlighting how historical events can shape media technology and content.

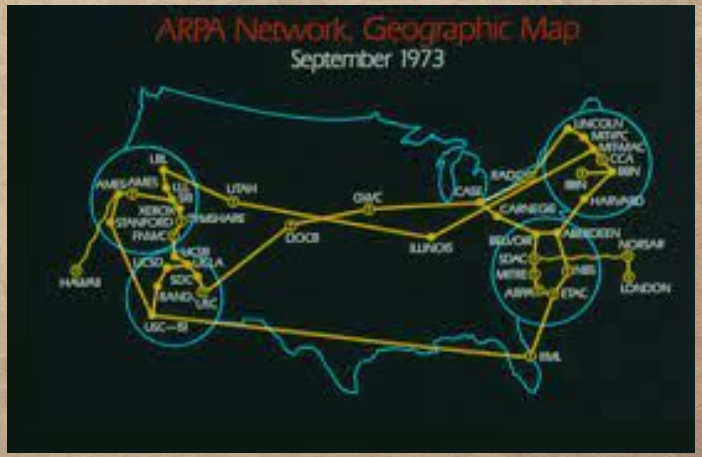
- 1940-1945: Television production is halted during World War II, as resources are diverted to the war effort
- 1946: Television production resumes in the United States, with a focus on post-war economic recovery
- 1950: Introduction of color television in the United States, revolutionizing the viewing experience
- 1962: The first communications satellite, Telstar, enables live transatlantic television broadcasts for the first time
- 1964: Japan hosts the first live international sporting event broadcast via satellite, the Summer Olympics

From the Industrial Age to the Information Age

From the Industrial Age to the Information Age

Arpanet and early internet development in the 1960s and 1970s set the stage for the digital revolution, paving the way for modern communication and connectivity.

- ARPANET (**Advanced Research Projects Agency Network**) was developed based on the idea of having a decentralized network to withstand a nuclear attack as a way to share resources between remote, connected computers
  - First computers were connected in 1969, network went operational in 1971, run by the Defense Department from 1975 to 1990
  - It was the precursor to the internet, connecting 4 university research computers for the first time



From the Industrial Age to the Information Age

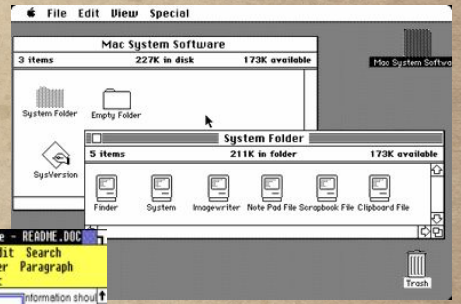
At the same time, the rise of magnetic tape recording formats in the 1960s and 70s revolutionized audio and video recording and broadcasting

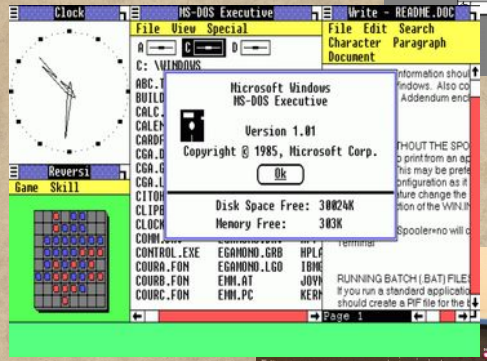
- Magnetic tape is invented in Germany in 1928, however it would not be until after WW2 that the technology is brought to the US and developed for commercial purposes
  - Invented in 1963, Cassette tapes are an analog audio recording and playback format that became mainstream in the 1970s and 80s due to the portability and convenience the format offered
  - Video Cassette Recording (VCR) is introduced in 1972, become mainstream in the 1980s and 90s
  - Both formats were replaced by optical disk formats CD and DVD

From the Industrial Age to the Information Age

The introduction of personal computers and operating systems in the 1970s and 1980s democratized computing, making it accessible to individuals and businesses.

- The dominance of Windows and Apple operating systems in the PC market begins in the early 1980s, influencing the way we interact with computers and software to this day
  - The 1970s saw the introduction of the Altair 8800, sparking the PC revolution.
  - Apple was founded in 1976, popularizing personal computing with the Apple I and Apple II.
  - In 1981, IBM introduced the IBM PC running MS-DOS, establishing Windows dominance.

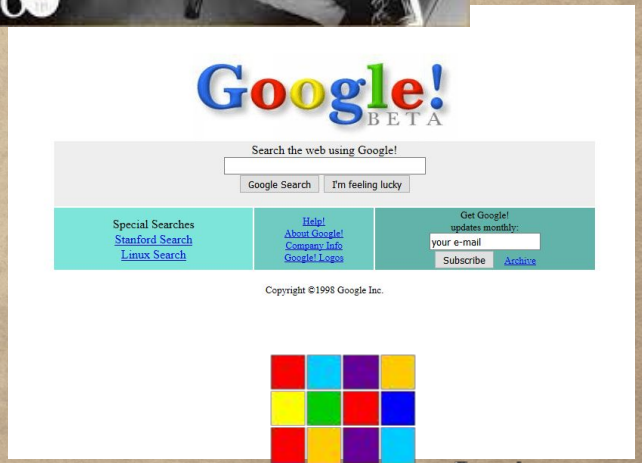




From the Industrial Age to the Information Age

During the 1980s to early 2000s, dial-up internet played a crucial role in popularizing the internet but was limited by slow connection speeds and the need to tie up phone lines.

- The first commercial email service, MCI Mail, is launched in 1986
- Tim Berners-Lee invents the World Wide Web in 1989, laying the foundation for the modern internet
- In the 1990s dial-up internet access becomes widely available to consumers, using telephone lines to connect to the internet
- In 1997, the first social media site SixDegrees.com is launched, laying the groundwork for future platforms
- In 1998, the Google search engine is launched, changing how people find information on the internet forever



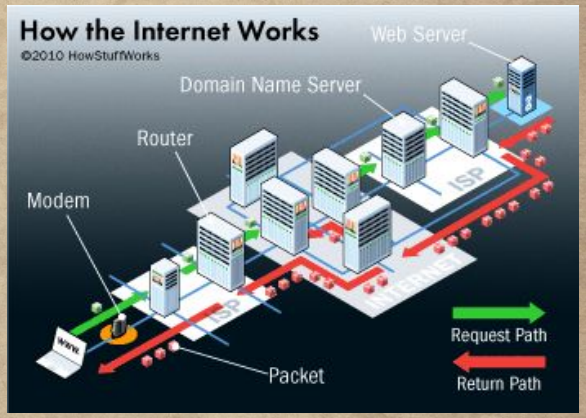
From the Industrial Age to the Information Age

From the Industrial Age to the Information Age

The rise optical disk formats and dial-up internet in the 1980s and 90s marks shift towards digital media

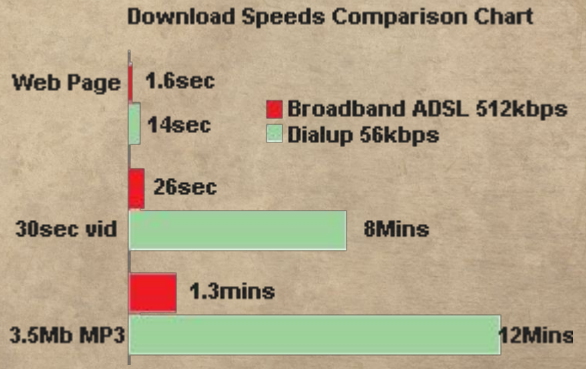
- Compact Disk (CDs) and Digital Video Disk (DVDs) dramatically increase the capacity to store media, sparking a digital revolution that enables high-quality recording, editing, and distribution of audiovisual content
  - CDs are introduced in 1982, and at the time, held more data than a personal computer
  - CDs become mainstream in the late 80s and 90s
  - DVDs are introduced to the public in 1996, but don't surpass VHS sales until the early 2000s

From the Industrial Age to the Information Age



The shift from dial-up to broadband internet in the 1990s and the widespread adoption of Wi-Fi in the 2000s revolutionized internet connectivity.

- The transition to broadband and Wi-Fi paved the way for the rise of streaming services, social media, and other online innovations, shaping the modern internet landscape.
  - Broadband internet, introduced in the late 1990s and early 2000s, offered faster speeds and always-on connectivity
  - Wi-Fi technology became widespread in the early 2000s, enabling wireless internet access within homes, offices, and public spaces



From the Industrial Age to the Information Age

During the 1990s music storage and consumption began to shift from analog devices to digital devices, and then by the early 2000s to streaming.

- Public access to portable music transitioned from carrying one album in a walkman or cd player, to having access to vast libraries of music on smartphones during this time
  - CD players become mainstream in the 1990s, offering digital audio playback.
  - In 2001, Apple introduces the iPod and iTunes, revolutionizing portable music with digital storage and playback and popularizing digital music downloads
  - The introduction of music streaming services like Pandora (2000) and Spotify (2006) offer on-demand access to vast music libraries, changing how we discover and listen to music

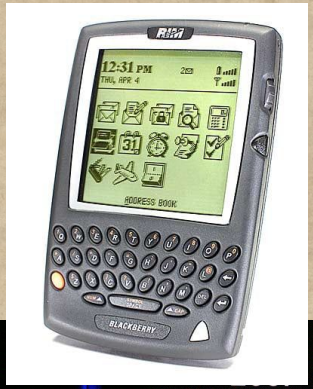
From the Industrial Age to the Information Age

The increasing adoption of smartphones in the 2000s revolutionized personal communication and internet access by enabling mobile internet access–leading to a surge in mobile app development and mobile browsing.

- The first smartphone, the IBM Simon Personal Communicator, was introduced in 1994, combining mobile phone and PDA (personal digital assistant) features.

- Competing devices like the BlackBerry, introduced in 2002, and the Palm Treo, introduced in 2003, popularized mobile email and internet access.

- The first iPhone is released in 2007, combining phone, internet, and multimedia capabilities, revolutionizing the smartphone industry.



From the Industrial Age to the Information Age

The advent of streaming services revolutionized how we consume media, leading to the decline of traditional cable TV

- Streaming services lead to a shift in how media is consumed, with more focus on on-demand content and personalized viewing experiences
  - Traditional cable TV subscriptions start declining in the late 2000s as viewers switch from digital video recorders (DVR) to streaming services for on-demand content
  - Netflix launches its streaming service in 2007, followed by Hulu in 2008, offering a new way to access TV shows and movies.
  - Streaming services introduce the concept of binge-watching, allowing viewers to watch entire seasons of shows at once

From the Industrial Age to the Information Age

Social media has evolved from early networking sites in the late 1990s to today's diverse platforms that connect billions of users worldwide and have transformed communication, information sharing, and networking, influencing various aspects of society and culture.

- In the late 1990s Six Degrees and Friendster pioneered online networking, laying the groundwork for future platforms
- In 2003, MySpace popularized social networking with customizable profiles and music sharing, setting the stage for the social media explosion
- Facebook's launch in 2004 revolutionized social networking with its focus on real-world connections and the introduction of the News Feed

From the Industrial Age to the Information Age

Social media has evolved from early networking sites in the late 1990s to today's diverse platforms that connect billions of users worldwide and have transformed communication, information sharing, and networking, influencing various aspects of society and culture.

- While not a traditional social media platform, in 2005 YouTube transformed video sharing, becoming a hub for content creators and viewers alike
- In 2006, Twitter introduced microblogging, allowing users to share short updates and shaping real-time communication
- In 2010 Instagram's emphasis on visual content and simplicity made it a go-to platform for photo and video sharing
- Launching in 2011, Snapchat innovated with ephemeral messaging, changing how we share moments