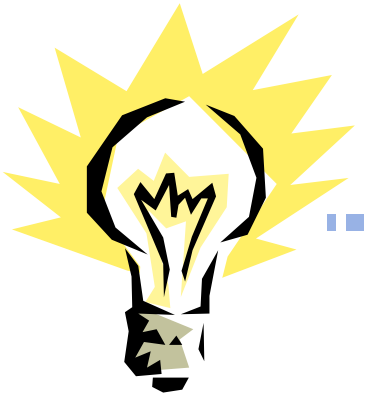
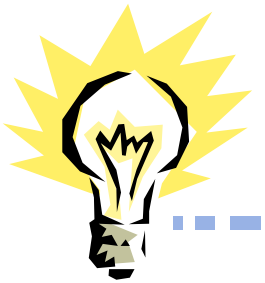


(Brief) History of HCI

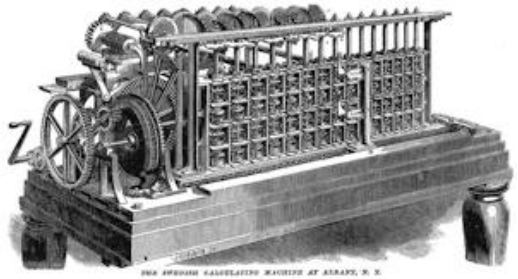
Key people, events and ideas in HCI



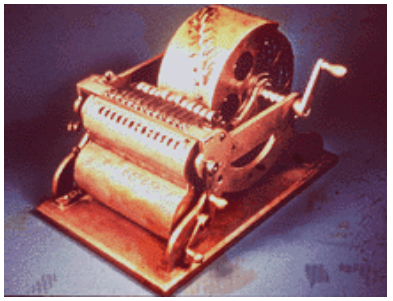
History of HCI

- Digital computer grounded in ideas from 1700's & 1800's
- Technology became available in the 1940's and 1950's
- The "user" concept is relatively new

History of HCI

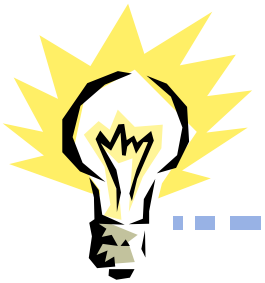


- **Mechanical Computers** http://www.thocp.net
- **1623 Schickard makes "Calculating Clock".**
  6-digit machine can add, subtract, bell indicates overflow.
- **1674 Leibniz designs his "Stepped Reckoner"**
  Can multiply, with operands of up to 5 and 12 digits.
  User turns a crank for each unit in each digit



- **1820 de Colmar makes "Arithmometer"**
  First mass-produced calculator. Does multiplication & division.
  It is also the most **reliable** calculator yet.
  Continue to be sold for about 90 years.

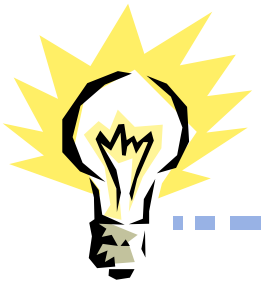
- **1889 Felt invents the first printing desk calculator.**
- **1935 IBM introduces "IBM 601", punch card machine**
  capable of 1 multiplication /second. 1500 are made.
- **1945 Mauchly & Eckert "ENIAC"** for ballistics.
  30 tons, 1000 ft^2 of floor, 140 kilowatts of electricity, 17,468 vacuum tubes
- **Enigma: German coding machine in WWII**



Batch Processing

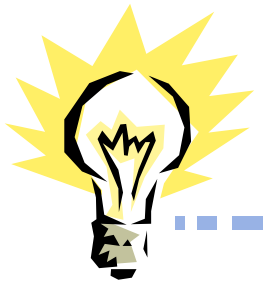
- Computer had one task, performed sequentially
- No “interaction” between operator and computer after starting the run

- Punch cards, tapes for input
- Serial operations



Paradigm Shifter: Vannevar Bush

- Postulated **Memex** device
  - Stores *all* records/articles/communications
  - Items retrieved by indexing, keywords, cross references (now called hyperlinks)
  - (Envisioned as microfilm, not computer)
- Interactive and nonlinear components are key



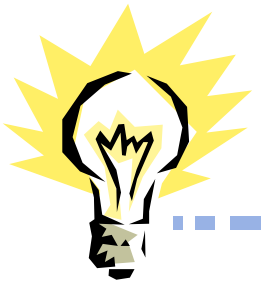
Mid 1960's

- Timesharing mode of computing
  - Computers too expensive for individuals timesharing increased accessibility
  - interactive systems, not jobs
  - text processing, editing
  - email, shared file system

Need for HCI

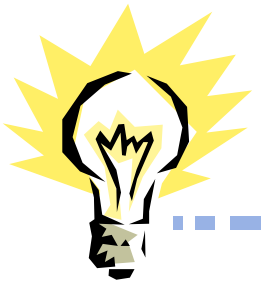
Paradigm Shifter: J.R. Licklider

- 1960 - Postulated "man-computer symbiosis"
- Couple human brains and computing machines tightly to revolutionize information handling



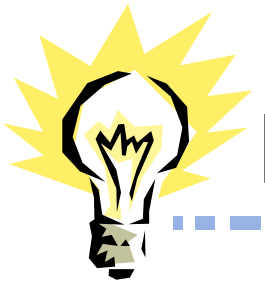
Paradigm Shifter: Ivan Sutherland

- **SketchPad** - ‘63 PhD thesis at MIT
  - Hierarchy - pictures & subpictures
  - Master picture with instances (ie, OOP)
  - Constraints
  - Icons
  - Copying
  - Light pen for input
  - Recursive operations

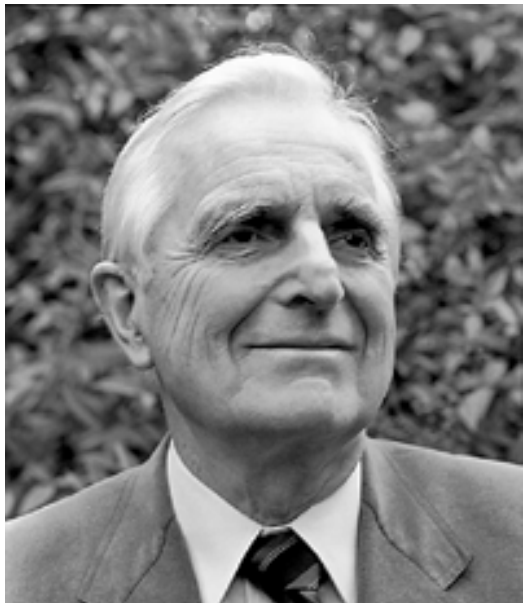


Computers as Toolkits

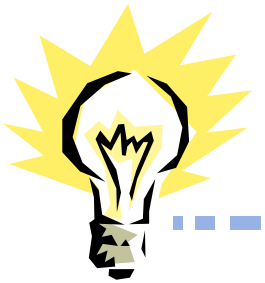
- Multipurpose toolkits
- Abstracting out common tasks (tools)
- Reusable elements
- At the disposal of humans



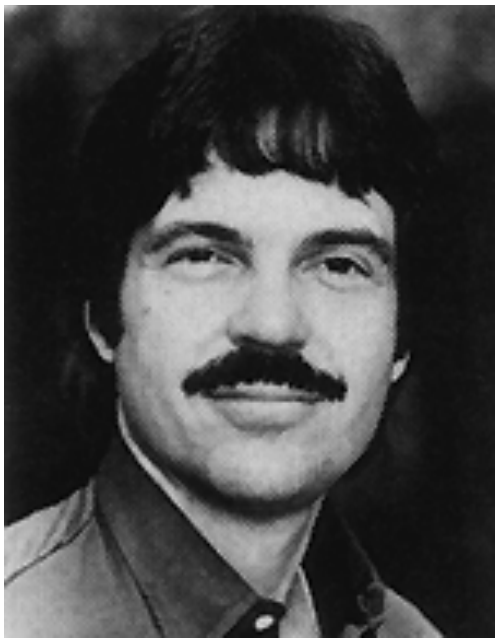
Paradigm Shifter: Douglas Engelbart



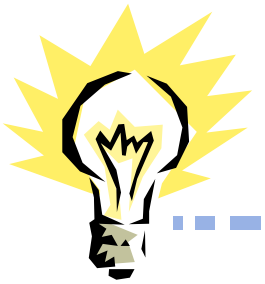
- Landmark system/demo:
  - **Mouse, windows**
  - Hypertext
  - Multimedia
  - High-res display,
  - Shared files, CSCW,
  - Electronic messaging, teleconferencing, ...
- Inventor of mouse



Paradigm Shifter: Alan Kay



- "Personal Computing"
- Dynabook: Notebook sized computer loaded with multimedia and can store everything
- Desktop interface metaphor

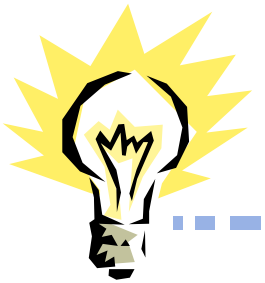


Paradigm Shifter: Ted Nelson

- Computers can help *people*, not just business
- Coined term “hypertext”

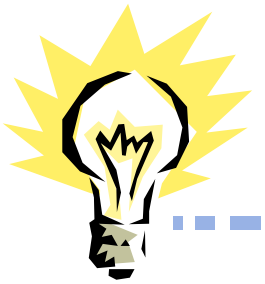
Personal Computers

- 1974 IBM 5100
- 1981 Datamaster
- 1981 IBM XT/AT
  - Text and command-based
  - Sold lots
  - Performed lots of tasks the general public wanted done
  - A good basic toolkit
- 1978 VisiCalc



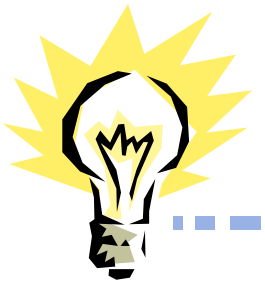
Personal Computing

- System is more powerful if it's easier to use
- Small, powerful machines dedicated to individual
- Importance of networks and time-sharing
- Time names "The Computer" Man of the Year, 1982 (http://www.time.com/time/special/moy/1982.html)



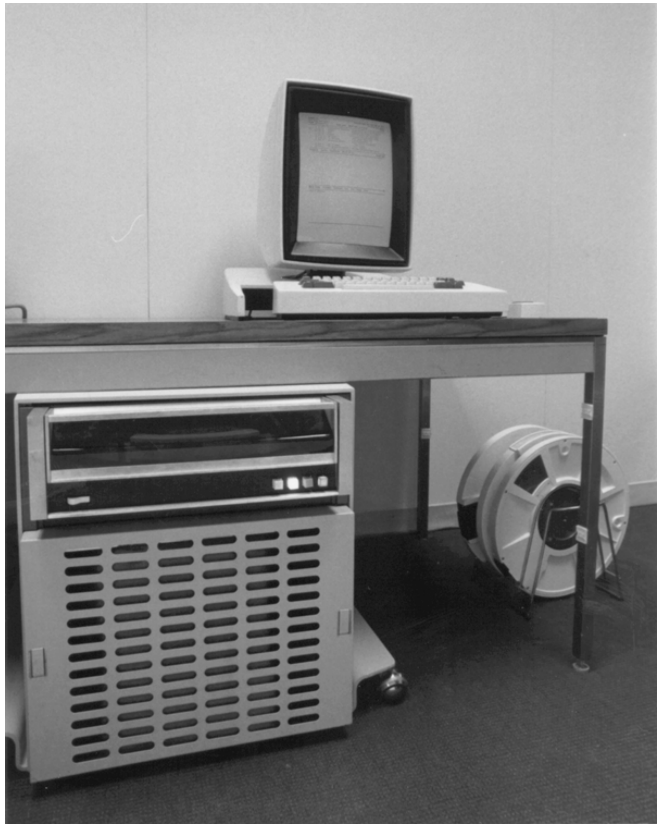
WIMP

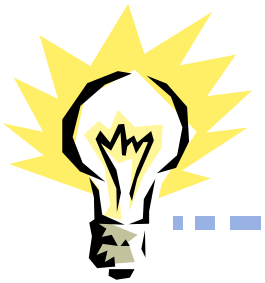
- **W**indows, **I**cons, **M**enus, **P**ointers
- Timesharing=multiusers; now we need *multitasking*
- WIMP interface allows you to do several things simultaneously
- Has become the familiar GUI interface
- Xerox Alto, Star; early Apples



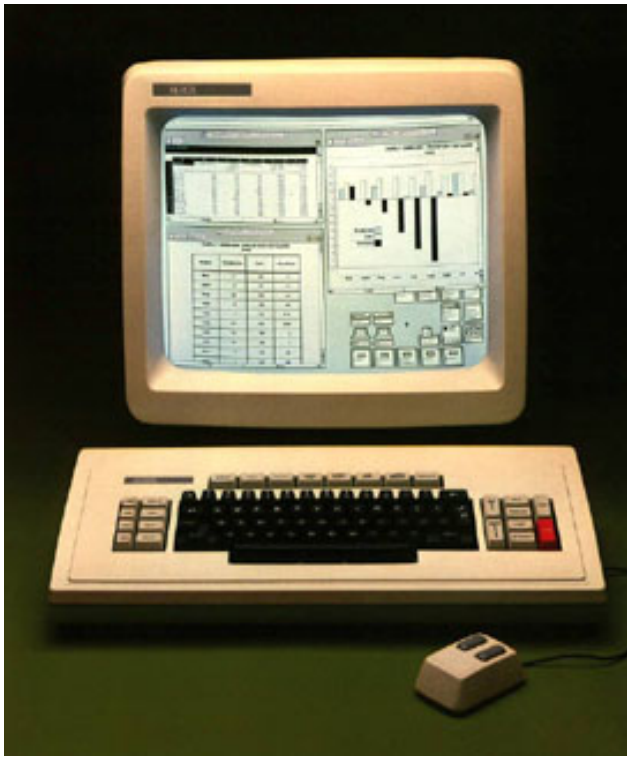
PCs with GUIs

- Xerox PARC - mid 1970's
- **Alto**
  - local processor, bitmap display, mouse
  - Precursor to modern GUI, windows, menus, scrollbars
  - LAN - ethernet

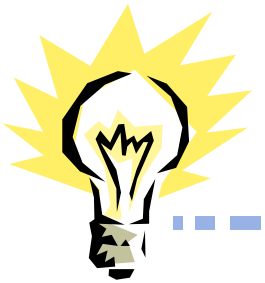




Xerox Star - ‘81

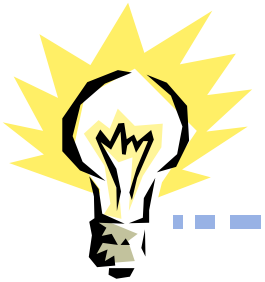


- First commercial PC designed for “business professionals”
  - desktop metaphor, pointing, WYSIWYG, consistency and simplicity
- First system based on usability
  - Paper prototyping and analysis
  - Usability testing & iterative refinement
- Commercial flop
  - $15k cost
  - closed architecture
  - lacking key functionality (spreadsheet)



Apple Macintosh - ‘84

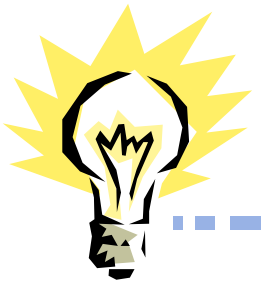
- Aggressive pricing - $2500
- Not trailblazer, smart copier
- Good interface guidelines
- 3rd party applications
- High quality graphics and laser printer



Multimodality

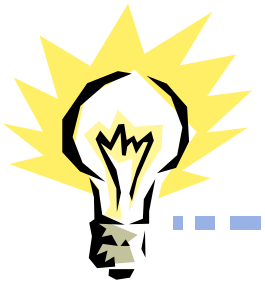
- Mode is a human communication channel
  - Not just the senses
    e.g., speech and non-speech audio are two modes

- Emphasis on simultaneous use of multiple channels for I/O



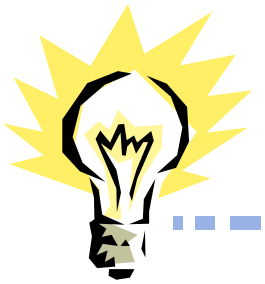
Speech, Language?

- Actions do not always speak louder than words
- Interface as mediator or agent
- Language paradigm
- How good does it need to be?
  - "Tricks", vocabulary, domains
- How "human" do we want it to be?
  - (HAL, Bob, PaperClip, Siri, Alexa)



Modern-Day Ubiquity

- Person is no longer user of virtual device but occupant of virtual, computationally-rich environment
- Can no longer neglect macro-social aspects
- Late ‘90s - PDAs, VEs, ...
- 2000’s - mobile phones, smartphones
- Now?...Social impacts: police, travel, protest, concerts, sports



Upcoming

- Frameworks for thinking about HCI
- User Centered Design Process
- Usability Principles
- Bad Designs, and the Design Process

- WIKI
- Project teams and ideas