# Human-Computer Interaction History of HCI Professor Bilge Mutlu

# Today's Agenda

- » Course format update
- » Topic overview: *History of HCI*
- » Discussion

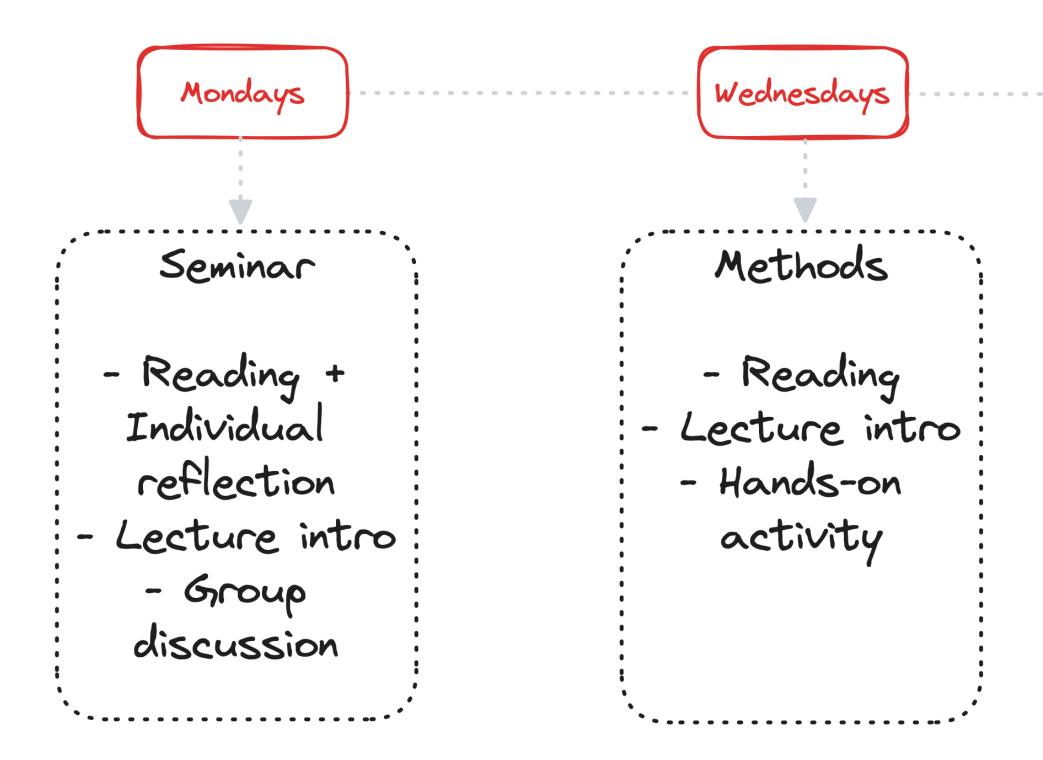
## Recap: Questions

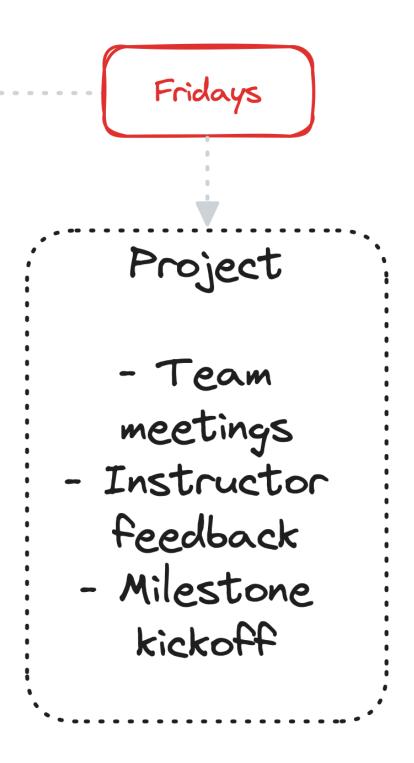
To ask questions during class:

- » Go to <u>slido.com</u> and use code #2938904 or <u>direct link</u> or scan QR code
- » Anonymous
- » I will monitor during class



# Course Format Update





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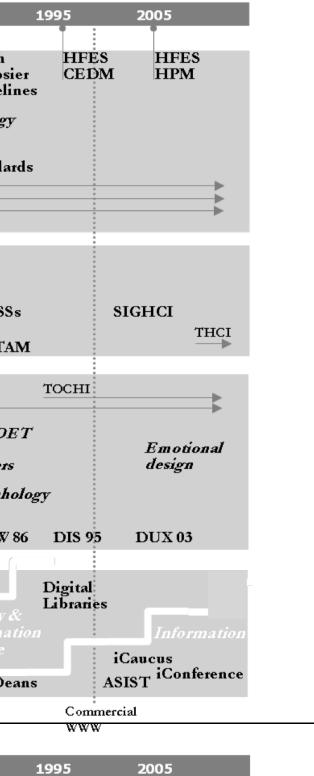
# **Associated Updates**

- **»** Instructor office hours: Friday class time
- » No project discussions on Mondays or Wednesdays
- » We will make project teams this Friday do not miss class!

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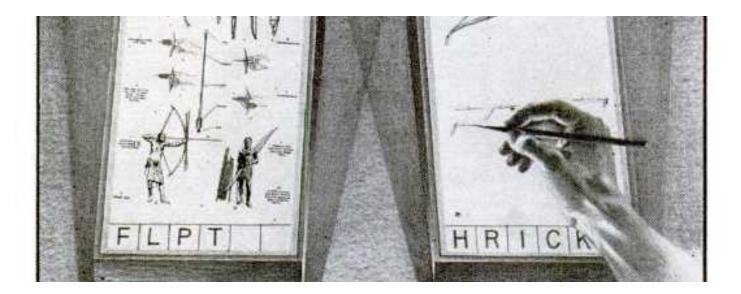
# Topic overview: *History* of HCI

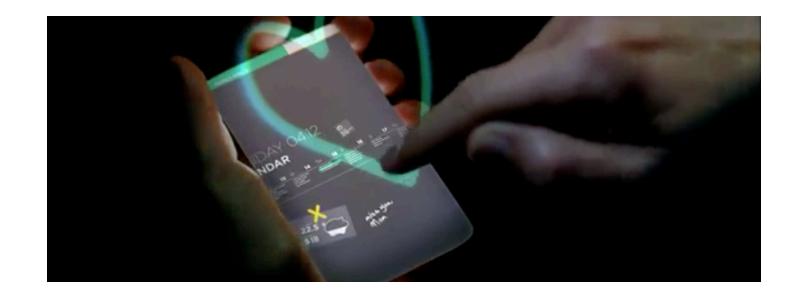
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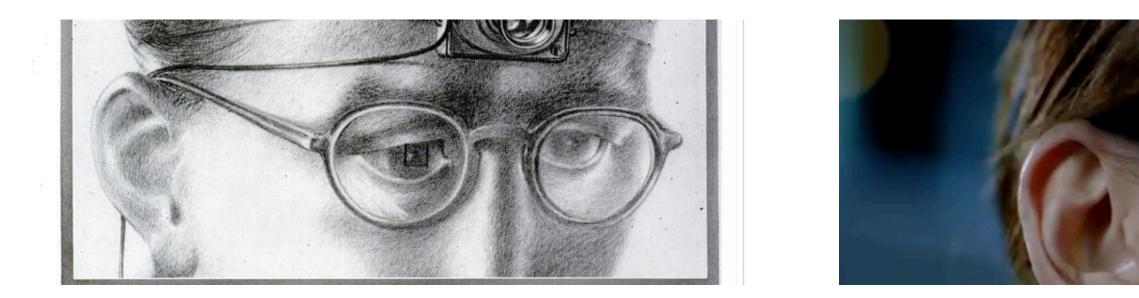


#### 1945 (Vannevar Bush)<sup>2</sup>

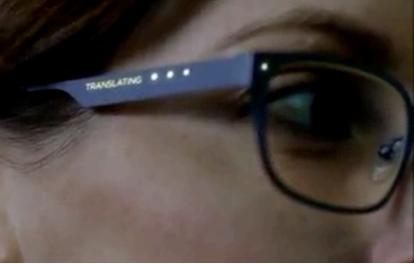
#### 2011 (Microsoft)







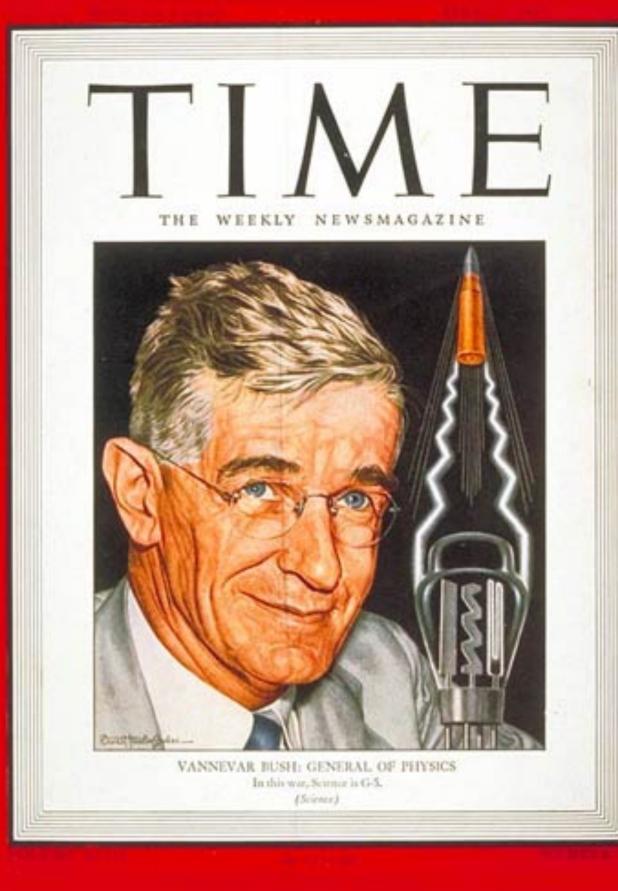
#### <sup>2</sup>Wired, Microsoft



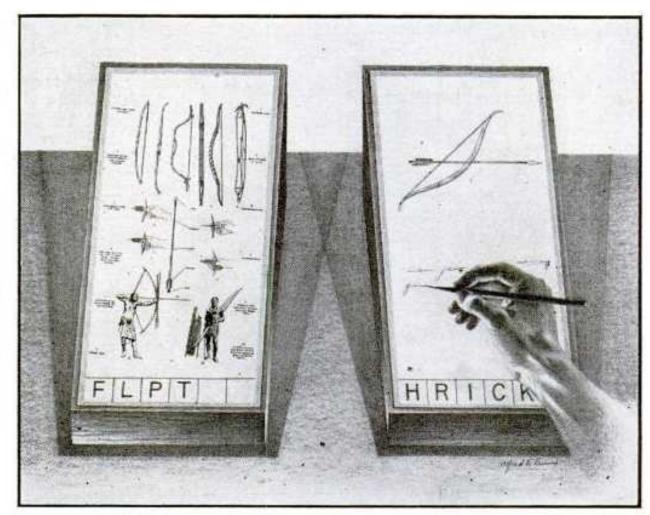
#### **1940s<sup>3</sup>**

*Memex*, 1945, Vannevar Bush, OSRD

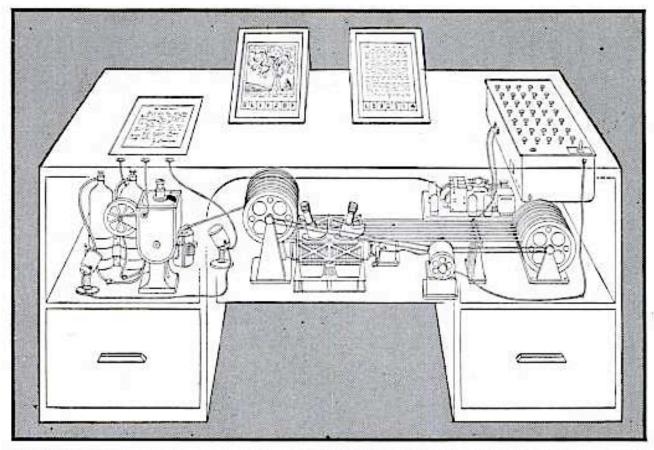
- Stores all records/articles/communications **>>**
- Items retrieved by indexing, keywords,  $\gg$ cross-referencing
- Information linked through associative  $\gg$ trails



<sup>3</sup>Image source



MEMEX IN USE is shown here. On one transparent screen the operator of the future writes notes and commentary dealing with reference material which is projected on the screen at left. Insertion of the proper code symbols at the bottom of right-hand screen will tie the new item to the earlier one after notes are photographed on supermicrofilm.



#### AS WE MAY THINK CONTINUED

#### <sup>4</sup>Image source

MEMEX in the form of a desk would instantly bring files and material on any subject to the operator's fingertips. Slanting translucent viewing screens magnify supermicrofilm filed by code numbers. At left is a mechanism which automatically photographs longhand notes, pictures and letters, then files them in the desk for future reference.

## **1960s**<sup>5</sup>

*Man-Computer Symbiosis*, 1960, Joseph Licklider, ARPA

"Men will set the goals, formulate the hypotheses, determine the criteria, and perform the evaluations. Computing machines will do the routinizable work that must be done to prepare the way for insights and decisions in technical and scientific thinking."



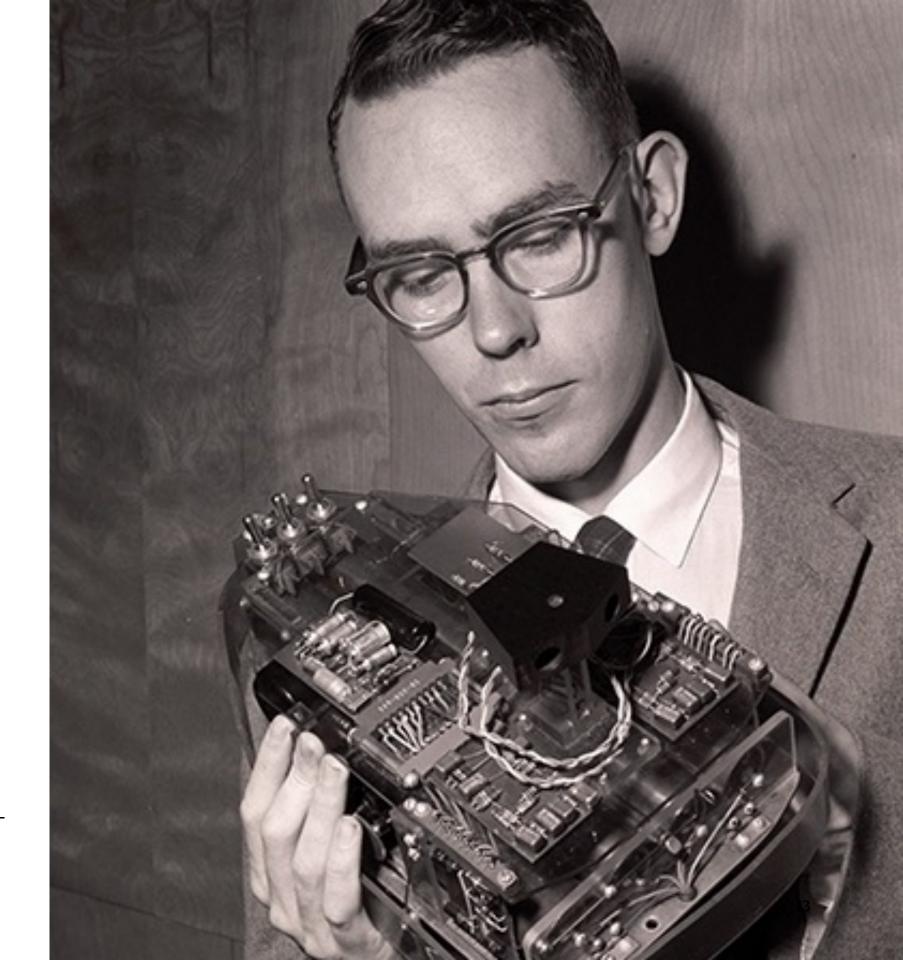
<sup>5</sup>Image source

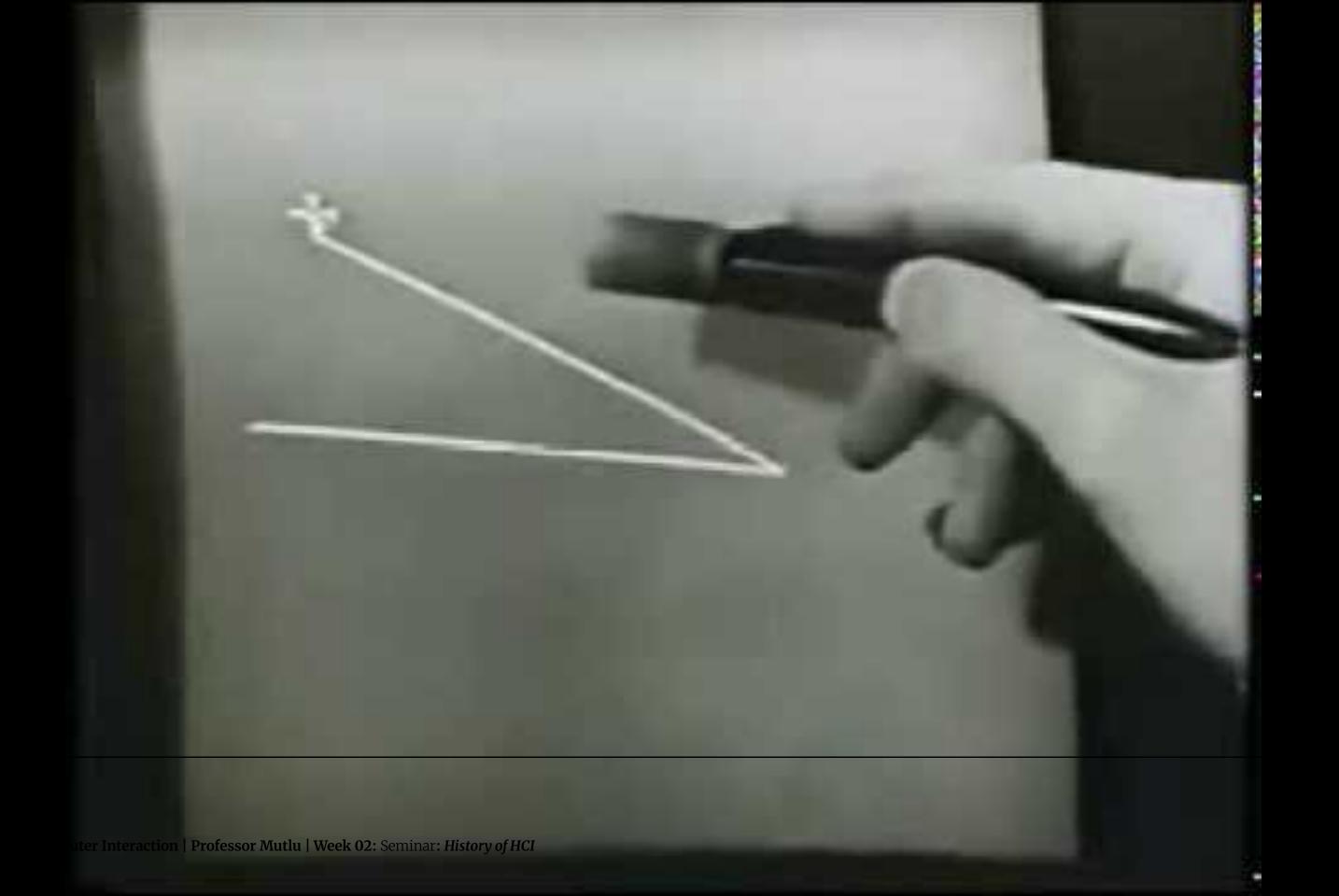
### **1960s**<sup>6</sup>

SketchPad, 1963, Ivan Sutherland, MIT

"Sketchpad: A Man-machine Graphical Communications System" introduced hierarchy, object-oriented graphics, constraints, icons, copying, light pen as input device, recursive operations

<sup>6</sup>Image source

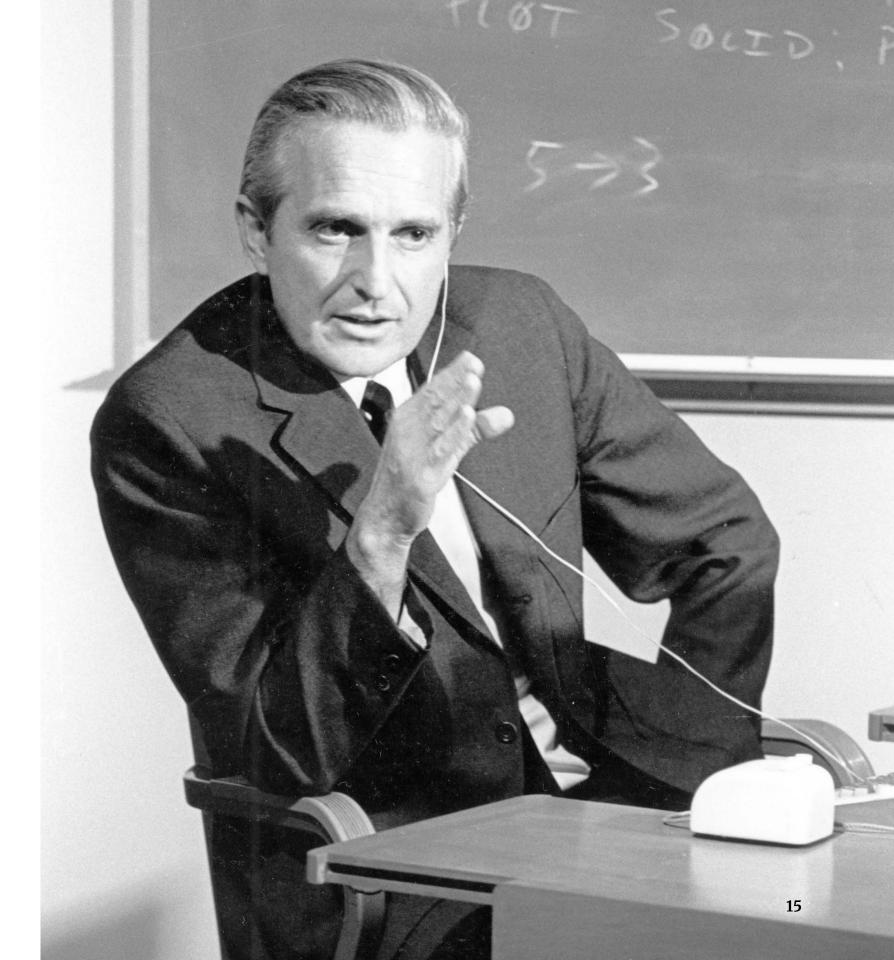




#### **1960s**<sup>8</sup>

*The Mouse*, 1968, Douglas Engelbart, Stanford Research Institute (SRI)

"<u>Mother of all demos</u>" introduced hierarchical hypertext, multimedia, windows, shared files, electronic messaging, video conferencing

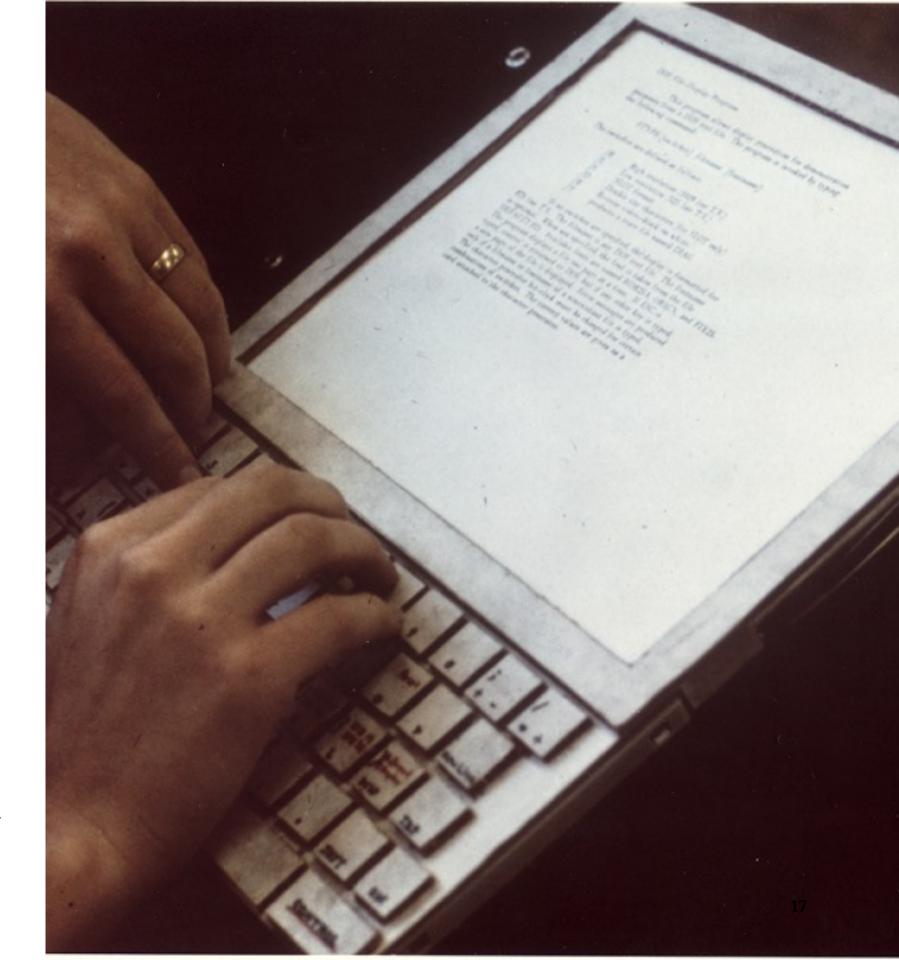


<sup>8</sup>Image source



#### **1960s**<sup>10</sup>

*Dynabook*, 1968, Alan Kay, Xerox PARC The Dynabook mockup introduced personal computer, desktop interface



<sup>10</sup>Image source

#### **1970s**

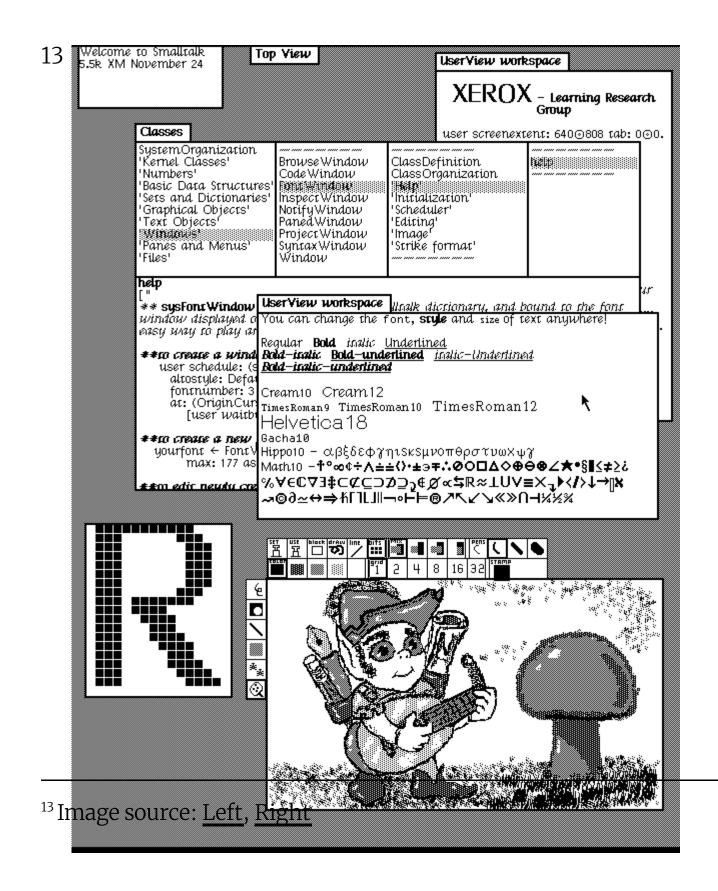
Xerox Alto, 1973, Xerox PARC<sup>11 12</sup>

The first computer to support an OS based on a GUI that integrated the ideas developed for Dynabook: the *desktop metaphor*, *GUI*, *ethernet* 

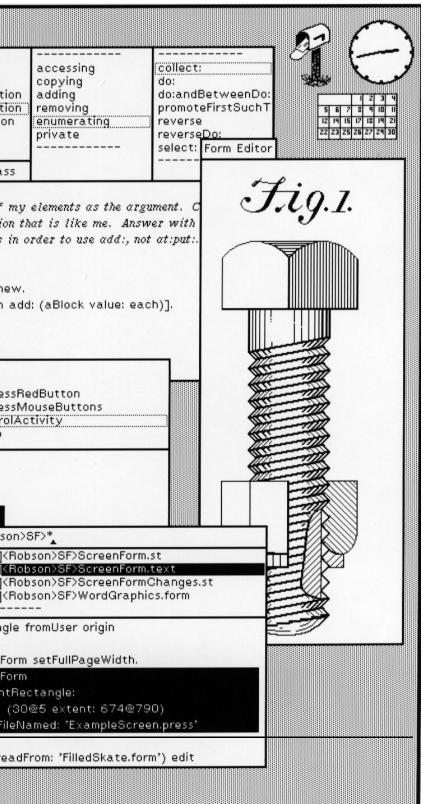
<sup>11</sup>Wikipedia: Xerox Alto

<sup>12</sup>Image source





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#### **1970s**<sup>14</sup>

Apple II, 1977, Apple

First mass production personal computer, color graphics

<sup>14</sup>Image source



#### **1980s**<sup>15 16 17</sup>

Xerox Star, 1981, Xerox PARC

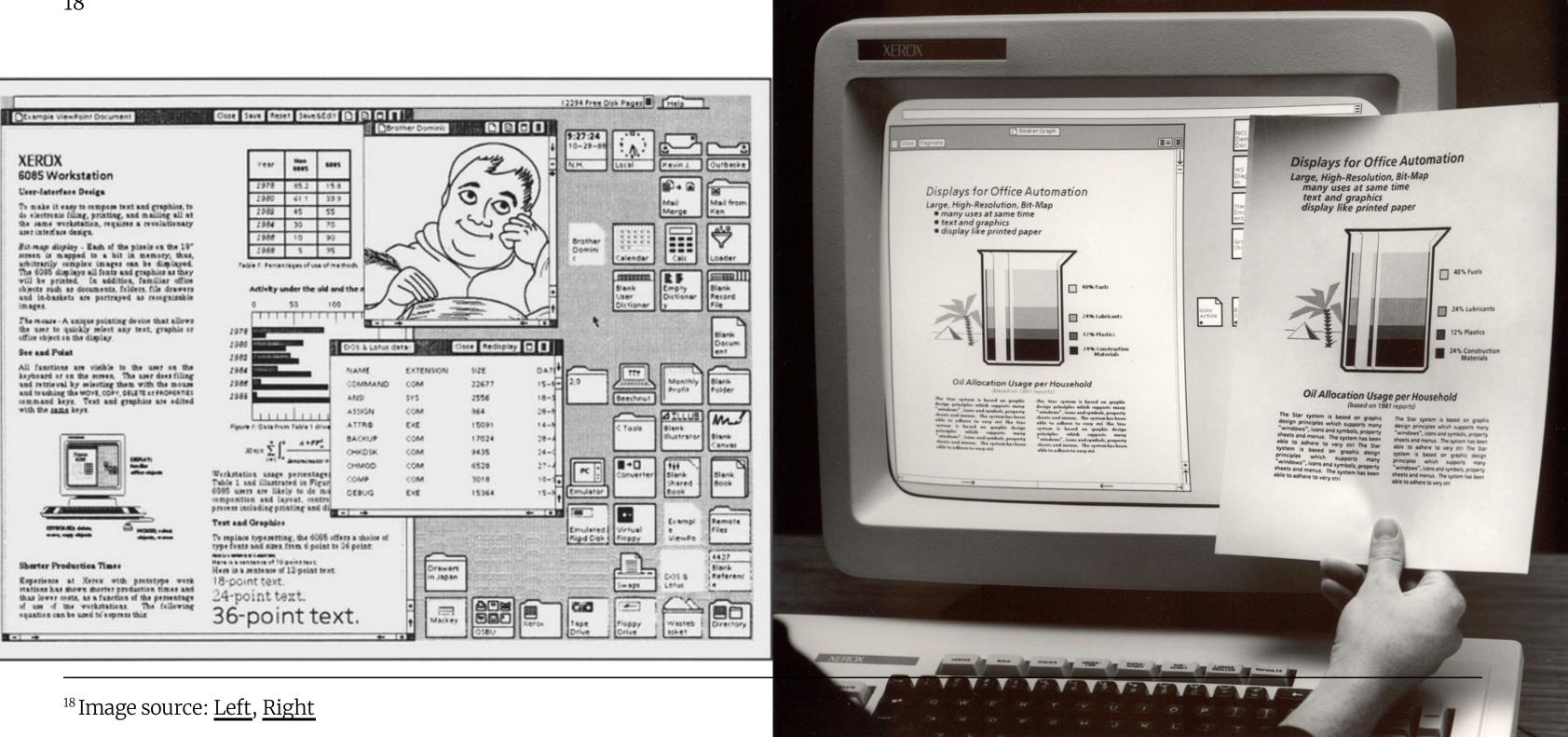
First commercial system with a user interface that integrates today's technologies, including windows, icons, folders, mouse, etc.

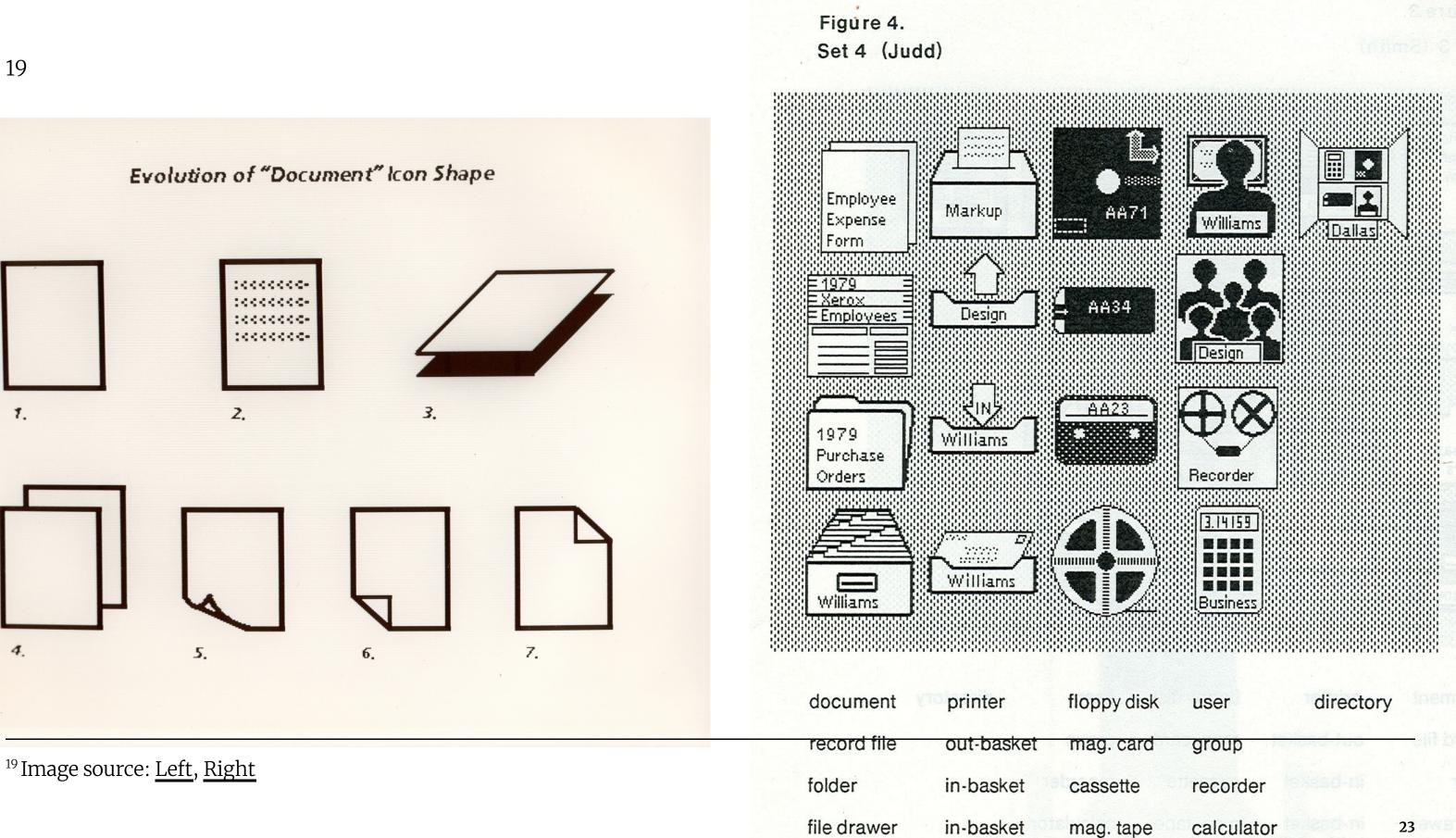


<sup>15</sup>Wikipedia: Xerox Star

<sup>16</sup>Videos of the Star Interface: <u>Part 1</u>, <u>Part 2</u>

<sup>17</sup>Image source





(with mail)

### **1980s**<sup>29</sup>

#### User testing of Xerox Star

The design effort took more than six years .... The actual implementation involved from 20 to, eventually, 45 programmers over 3.5 years producing over 250,000 lines of high level code.

By the time of the initial Star release, the Functional Test Group had performed over 15 distinct human-factors tests, using over 200 experimental subjects and lasting for over 400 hours.

_	Test Topic	N St
•	Selection Schemes	
	Keyboard (6 layouts) Display	
	Tab-indent	
	Labels	
	Property Sheets	:
	Fonts	
	Icons Initial Dialogue	
	HELP Graphics	
	Graphic Idioms J-Star Labels	

lo. ub	Tot. Hrs	Impact
28	64	Lead to new design; validated new scheme
20	40	Led to design of keyboard
20	10	Specified display phosphor and refresh rate
16	16	Caused redesign of Tab and Indent functionality
1 <b>2</b>	6	Caused change in property sheet and keyboard labels
20	40	Identified potential interface problems and redesigns
8	6	Led to decision on screen- paper coordination
20	30	Led to design of icons
12	36	Led to design of training facility and materials
2	6	Validated HELP design ideas
10	65	Led to redesign; validated new design
4	1 <b>6</b>	Contributed to redesigns
25	25	Led to design of keyboard labels for Japanese-Star

#### Figure 8. Partial listing of Star-1 Functional Tests

<sup>&</sup>lt;sup>29</sup> Bewley et al.

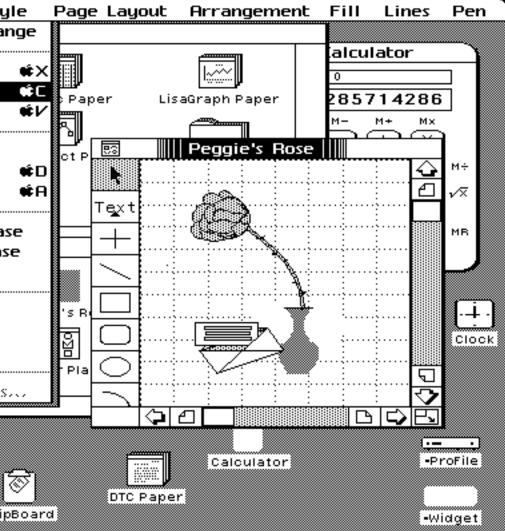
#### **1980s**<sup>28</sup>

Apple Lisa, 1983, Apple

Included many user interface innovations, including pull-down menus, dialog boxes, onebutton mouse

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WasteBasket	Preferences

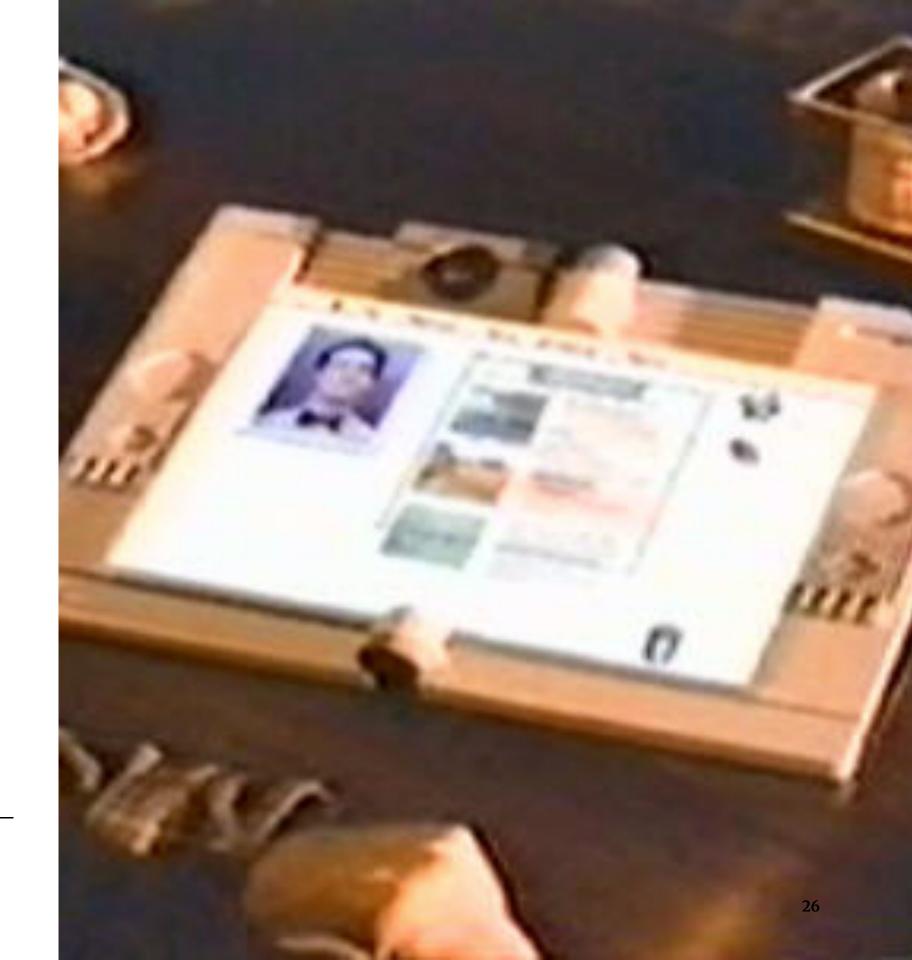
<sup>28</sup> Ars Technica



#### **1980s**<sup>20</sup>

<u>The Knowledge Navigator</u>, 1987, Hugh Dubberly, Apple ATG

Vision introduced speech interfaces, virtual agents



<sup>20</sup>Image source

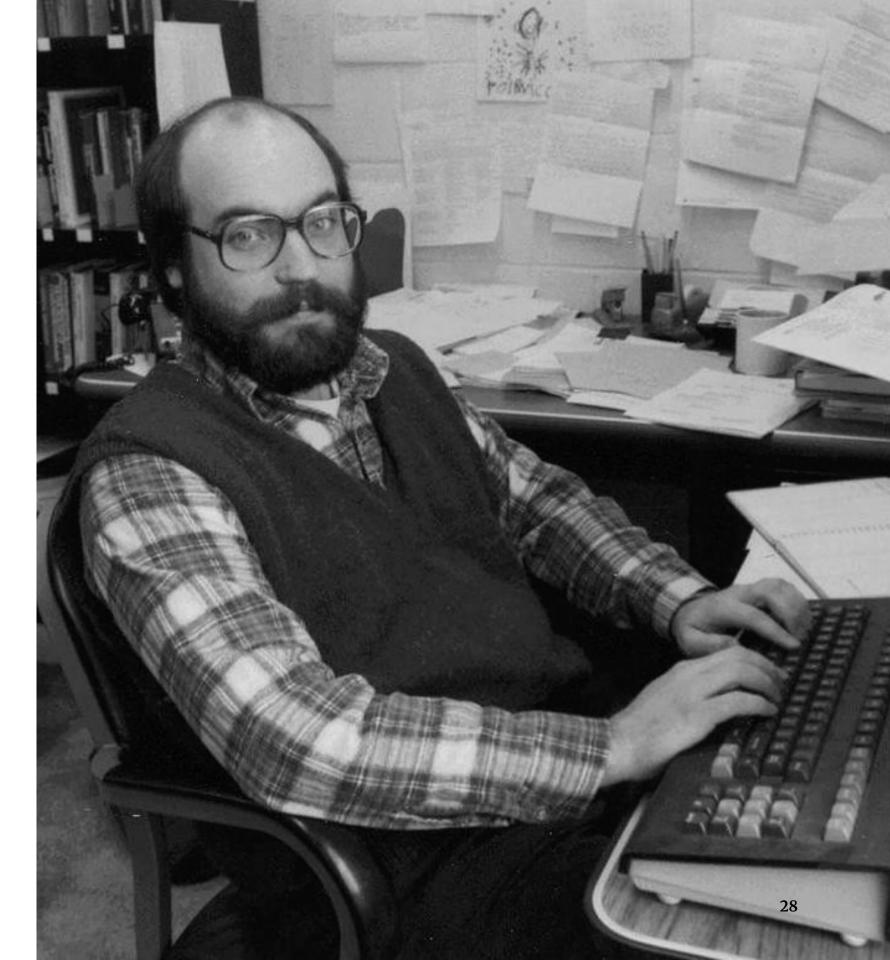


#### $1990s^{22}$

*Ubiquitous computing*, 1991, Mark Weiser, Xerox PARC

#### The Computer for the 21st Century

"The most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it."



<sup>22</sup>Image source

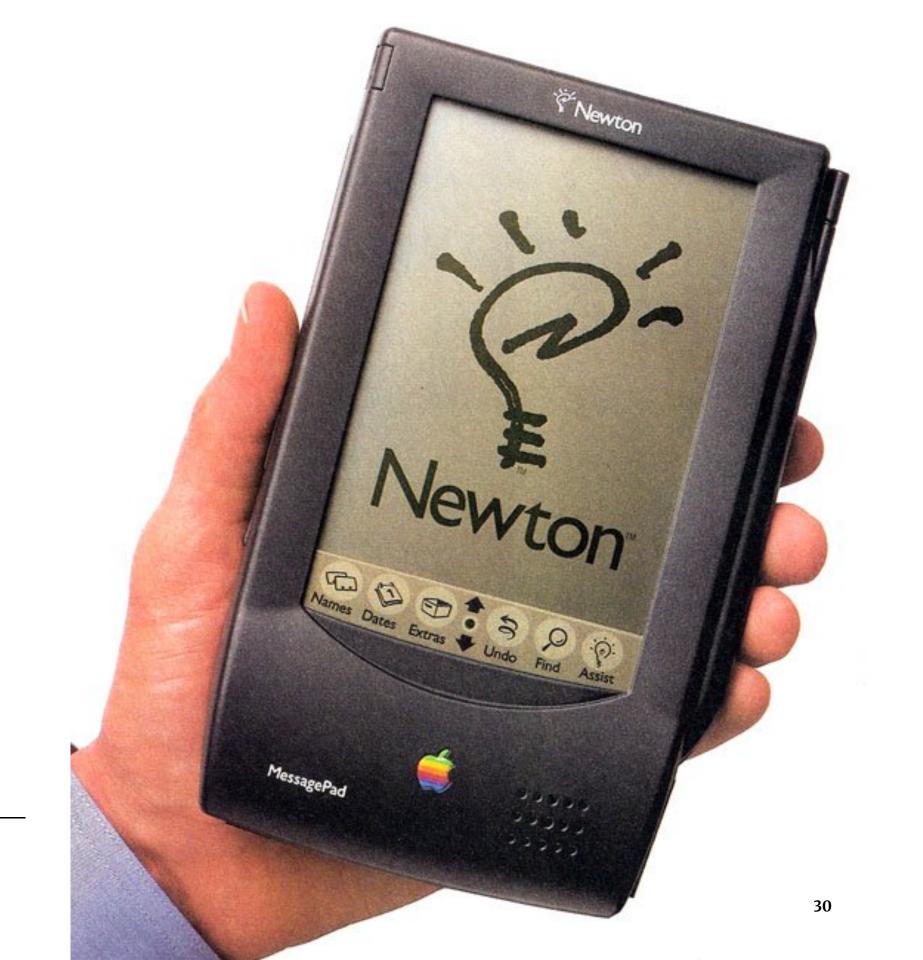




Apple Newton, 1992, Apple

The first handheld, wireless communication assistant; interaction entirely using a stylus; \$699!

<sup>24</sup>Image source





#### **1990s**<sup>26</sup>

Clearboard, 1992, Hiroshi Ishii, NTT

Prototype introduced shared visual workspace, matched reference points, videoconferencing

<sup>26</sup>Image source



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#### <sup>27</sup>Vimeo

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# Discussion

# **Discussion Format**

- » Group discussion ~15 minutes
  - » Separate to 10 groups randomly
  - » Discuss with your group members
  - » Take notes in <u>the shared doc</u> pick your group number
- » Summary from each group & discussion ~15 minutes
- » We will distill takeaways and share notes after class

## **Some Questions**

- » What did you take from the history you read?
- » What was surprising, unintuitive, unexpected?
- » How does what you read change how you see HCI?
- » How did external resources challenge/complement?

» ...

# What's Next?

- **Wednesday:** Read "Chapter 1 Introduction to HCI research" from textbook  $\rightarrow$
- **Friday:** Be prepared to choose a research topic and a team  $\gg$