

# Interaction Design

Chapter 1 (April 09, 2014, 9am-12pm):  
History

# History

- Course Overview (Timetable) + Organizational Stuff
- What is Interaction Design?
- The Story of the Mouse
- PARC
- The Desktop Metaphor
- The GUI

## Tutorials & Exam

- **Interaction Design** required for Concept Development
- no Podcast, so be here every week :)
- register via UniWorX!
  
- **tutorials** close to the lecture
- practical exercises to apply theoretical knowledge
- important preparation for the exam
- will be held in breakout sessions during the lecture
- sometimes a bit homework possible
  
- **Bonus** of 5% in exam possible if you hand in deliverable at the end
- deliverable: sketchbook with works during and inspired by the course / documentation of the course to be delivered at the end of the semester (at the last lecture)
- **Written Exam** will be announced on the website shortly
- exact time and location will be announced soon

## Course Overview:

I History & Fundamentals

April / May

June

July

## Course Overview:

II Applying Interaction Design

April / May

June

July

## Course Overview:

III Beyond the Desktop

April / May

June

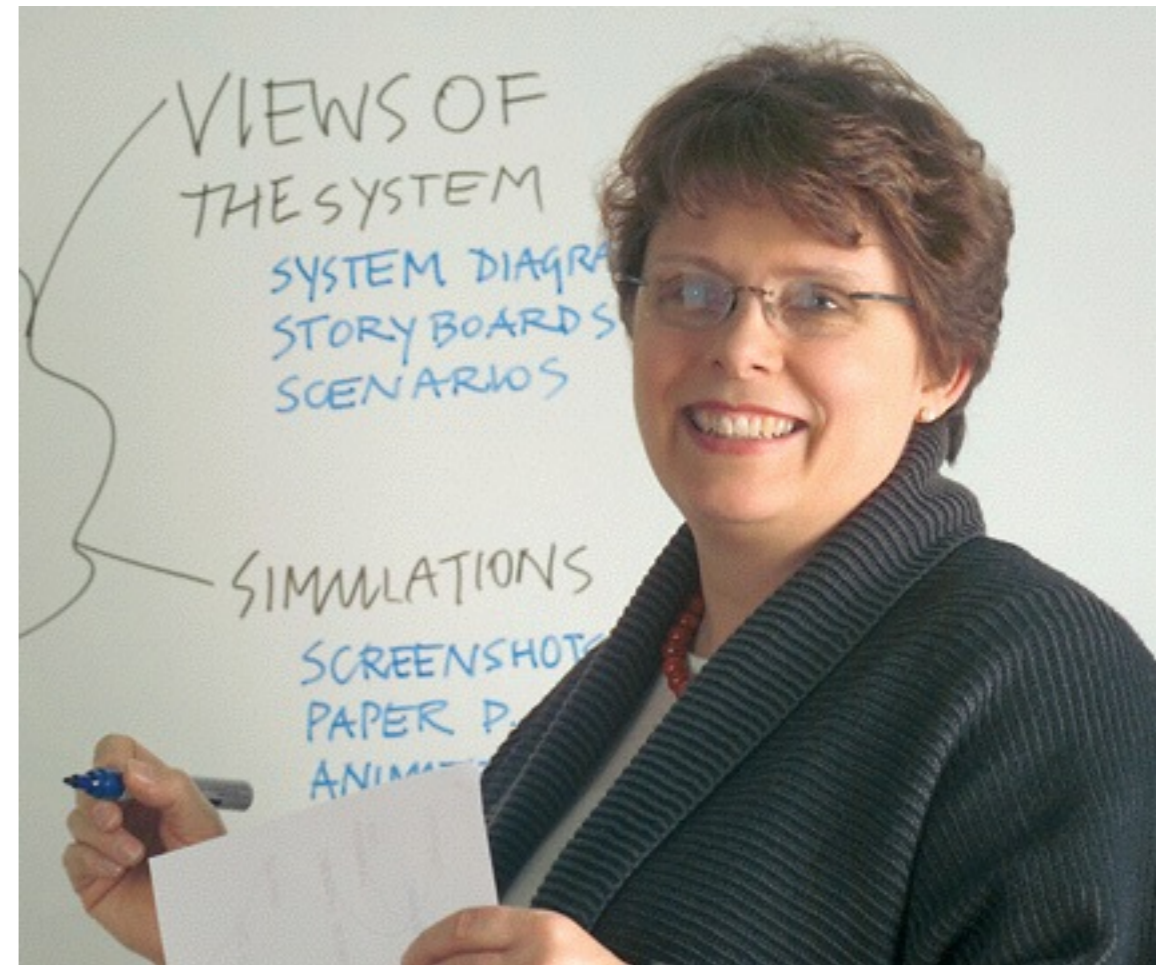
July

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## Gillian Crampton Smith

- established the first Interaction Design MA program at the Royal College of Art (RCA)
- was the founder and academic director of the Interaction Design Institute Ivrea (IDII)





705 ALMA ST.

ALL SYSTEMS NORMAL

01:53P Wed 09/04/02



AC POWER

ACKNOWLEDGE  
STEP



FIRE

## **Looking back... (Discussion Part)**

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-shaping our lives through digital artefacts...

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- good IxD refers to a “mental model”

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- elements of interaction design

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- good IxD refers to a “mental model”
- good IxD provides a “map” of where you are in a system, how you can move around and how you get back to the point where you started
- languages of interaction design
- elements of interaction design
- the part of the interaction designer is to design the **quality** on how the interaction is performed, how the system behaves



# Designing for Everyday Life



## Designing for Everyday Life

(1) Professional Tools

(2) Game Machines for Teenagers



**25 years ago**

**today**

## Designing for Everyday Life

**(1)** Professional Tools

**(2)** Game Machines for Teenagers

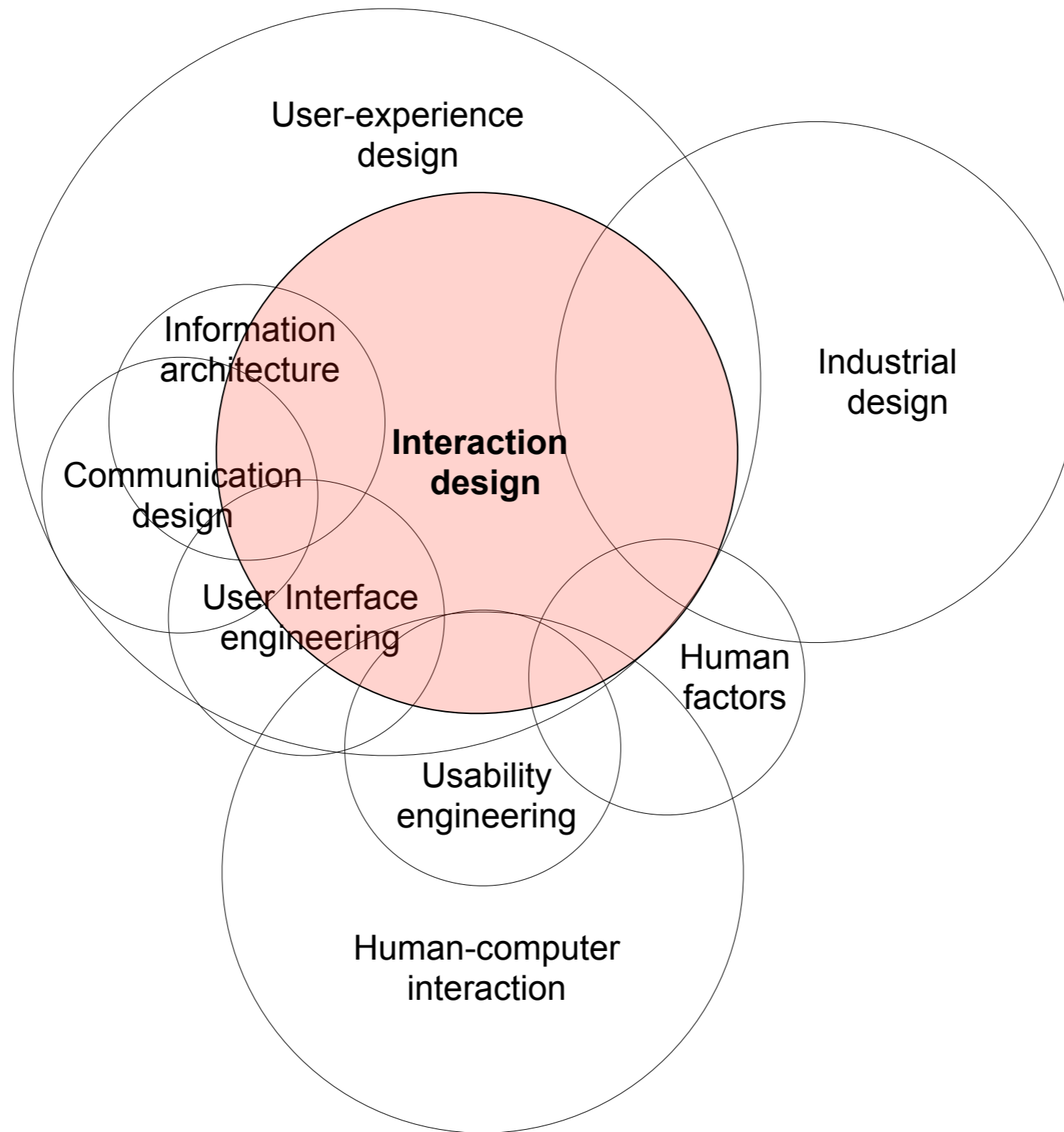
**(1)** Larger user groups  
(e.g. Kids/Parents/  
Grandparents)

**(2)** Various Contexts of  
use (e.g. Work/School/  
Home/Leisure)



**25 years ago**

**today**



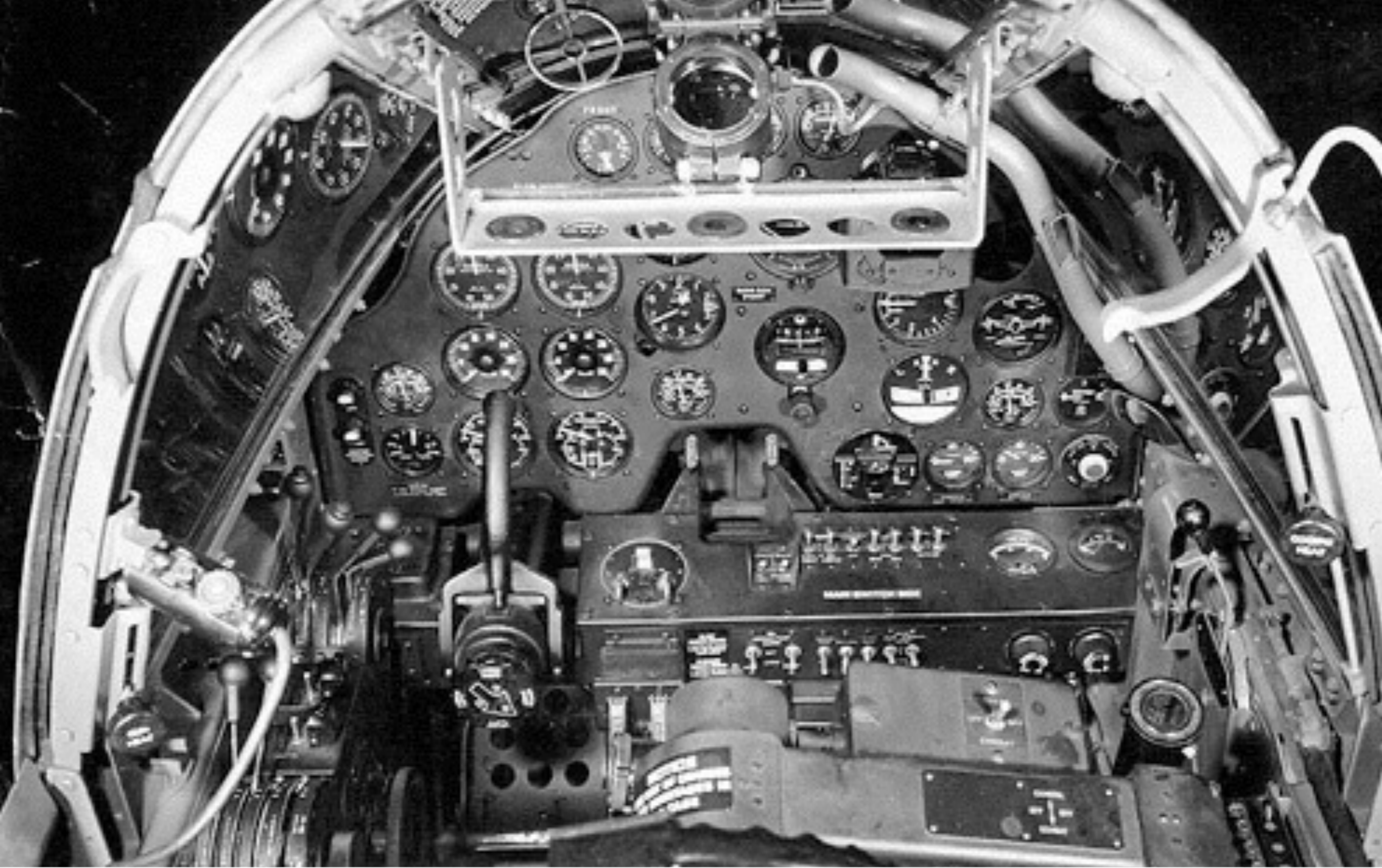
"Great design is as much about prospecting in the past as it is about inventing the future."

**Bill Buxton**

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The **Beginnings**...(let's jump back to 1943)



## P 38 Lightning Cockpit (1943)



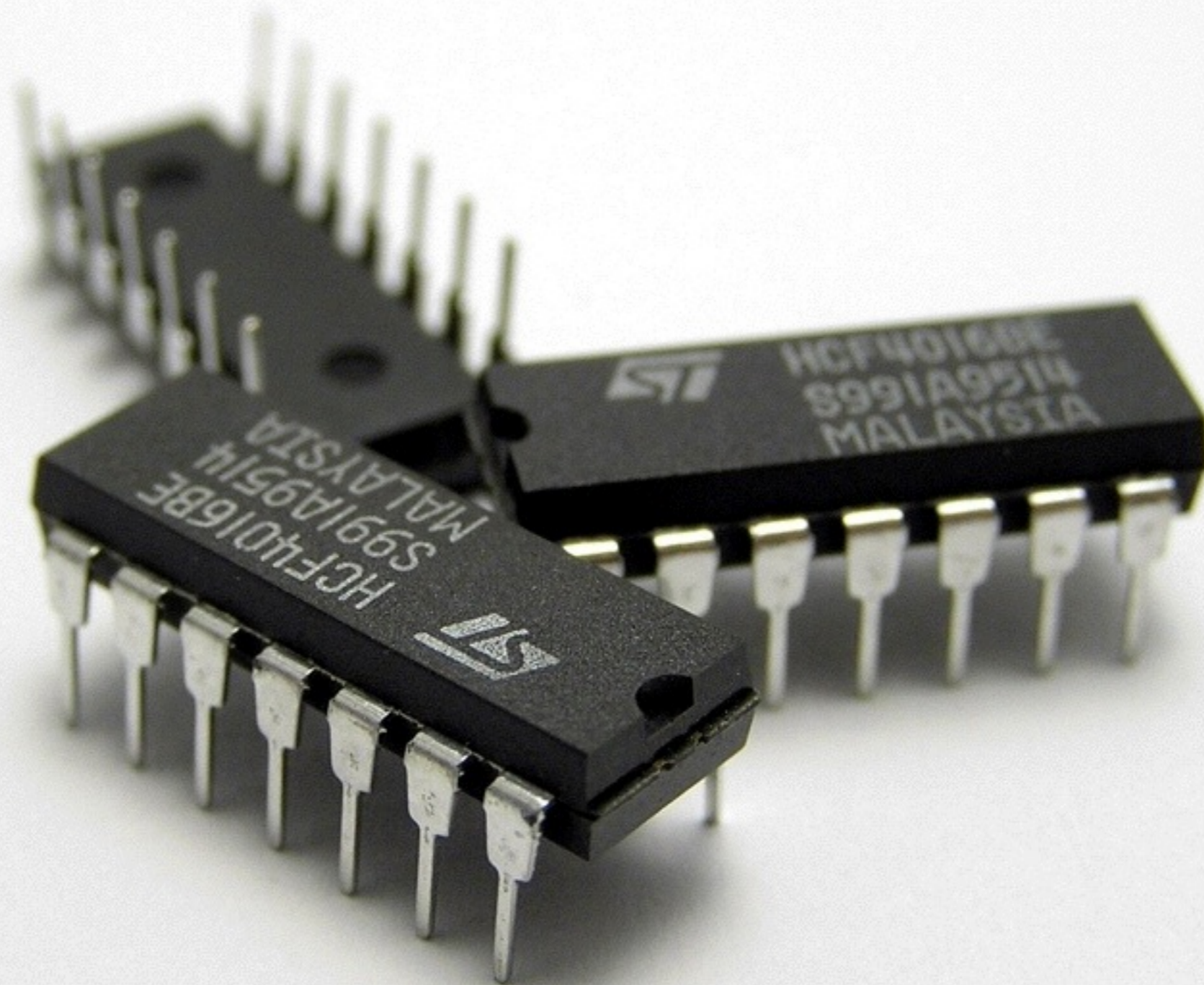


## EDSAC computer (1949)

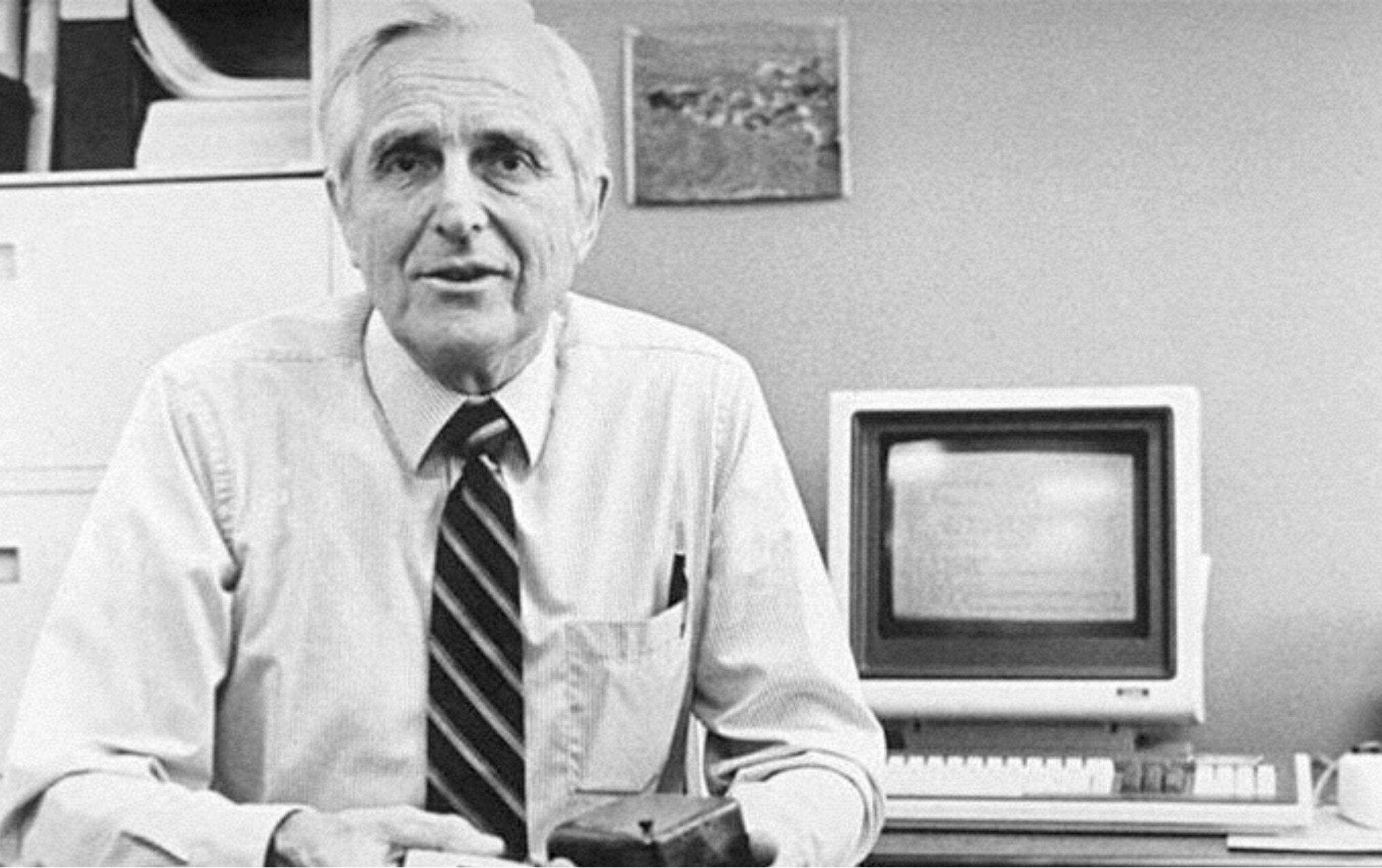
<http://www.xgn.nl/images/upload/20080908172430.jpg>

"I think there is a world market for maybe five computers."

**Thomas Watson,  
chairman of IBM, 1943**



## Mid sized ICs



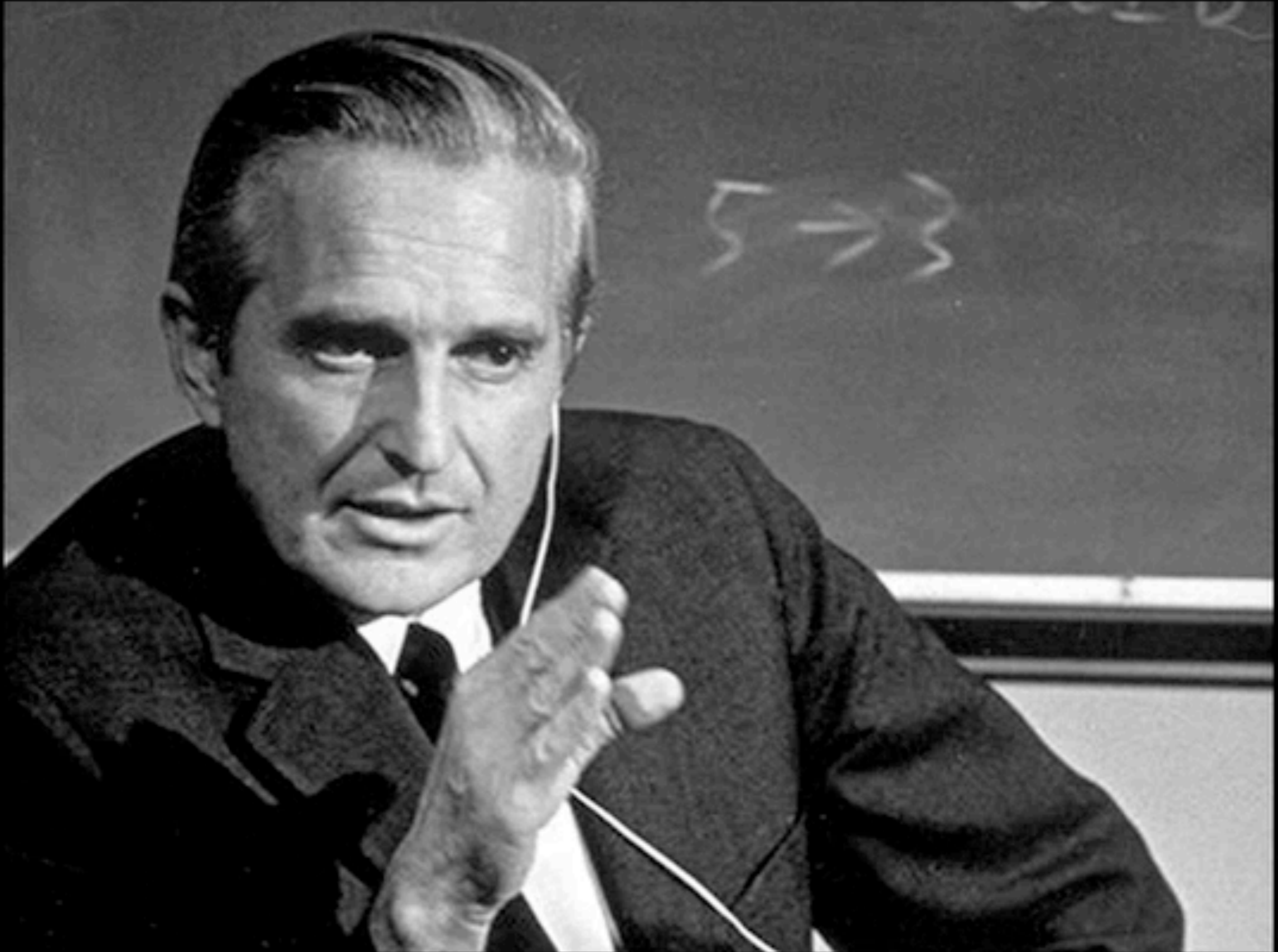
**Douglas Engelbart**

<http://www.corporationtocommunity.com/wp-content/uploads/2011/02/engelbart.jpg>

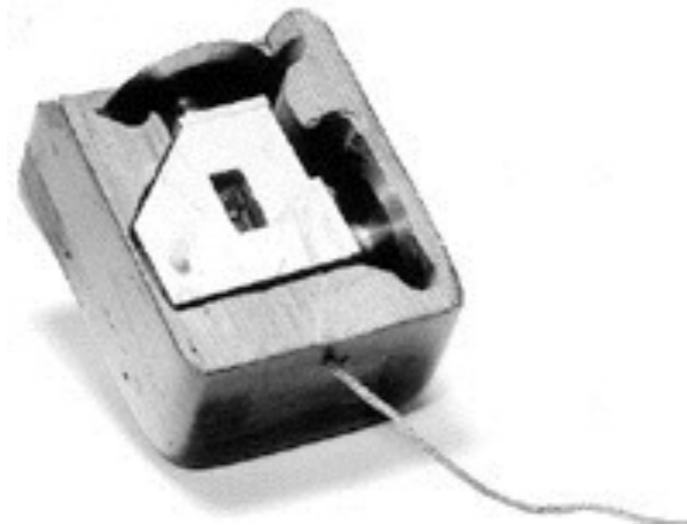
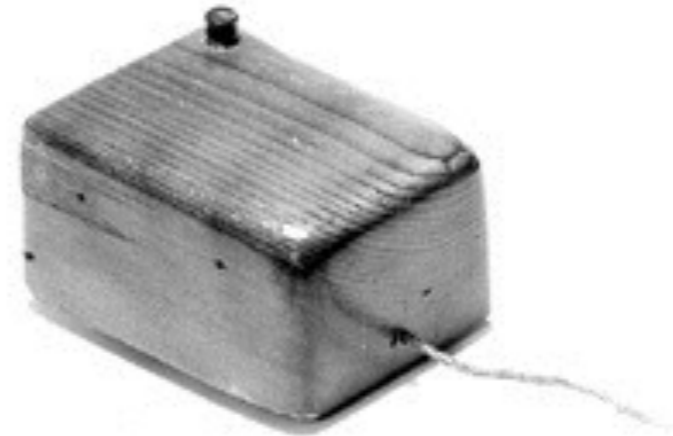
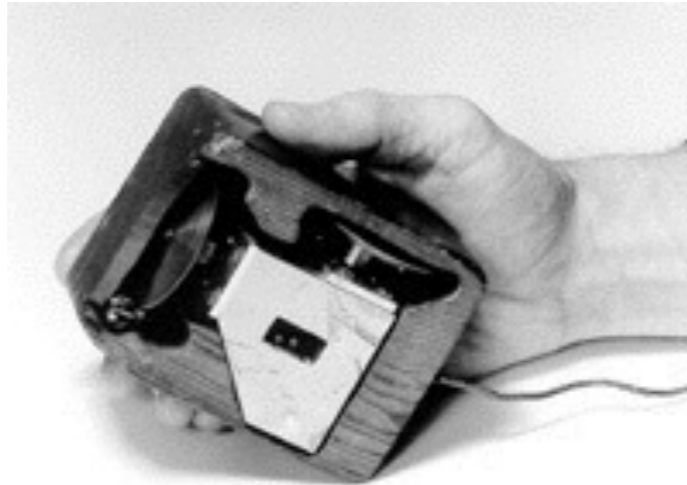
“When you were interacting considerably with the screen, you needed some sort of device to select objects on the screen, to tell the computer that you wanted to do something with them.”

**Douglas C. Engelbart, 2003, referring to 1964**





## Looking back... (Discussion)





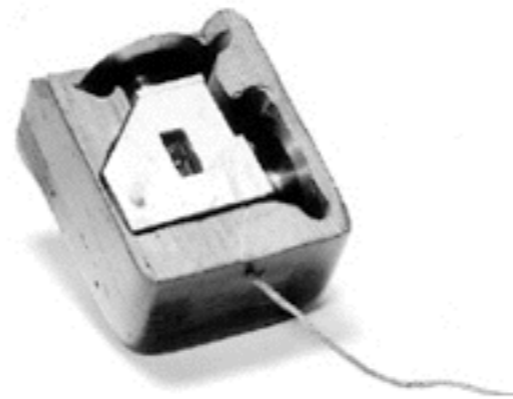
## Looking back... (Discussion)

-reflection of the process (concept generation)



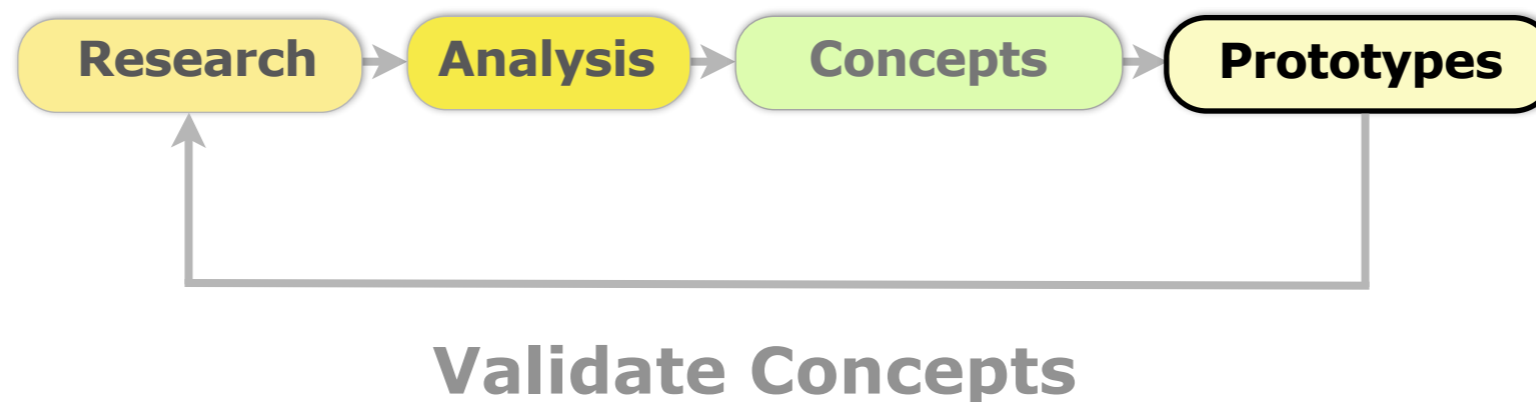
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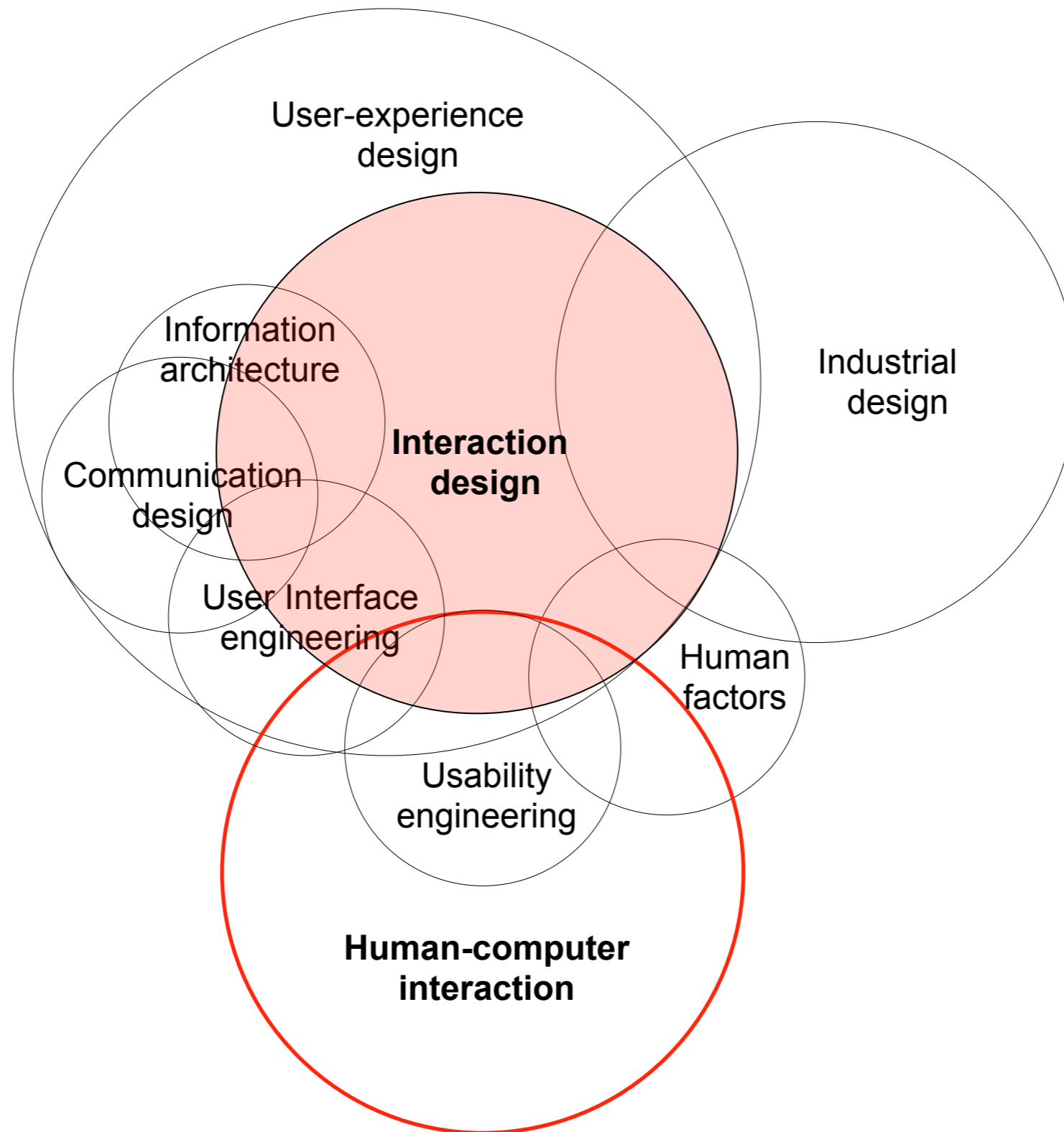
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- construction of different prototypes (alternative design)
- iterative development of prototypes (prototyping and testing)

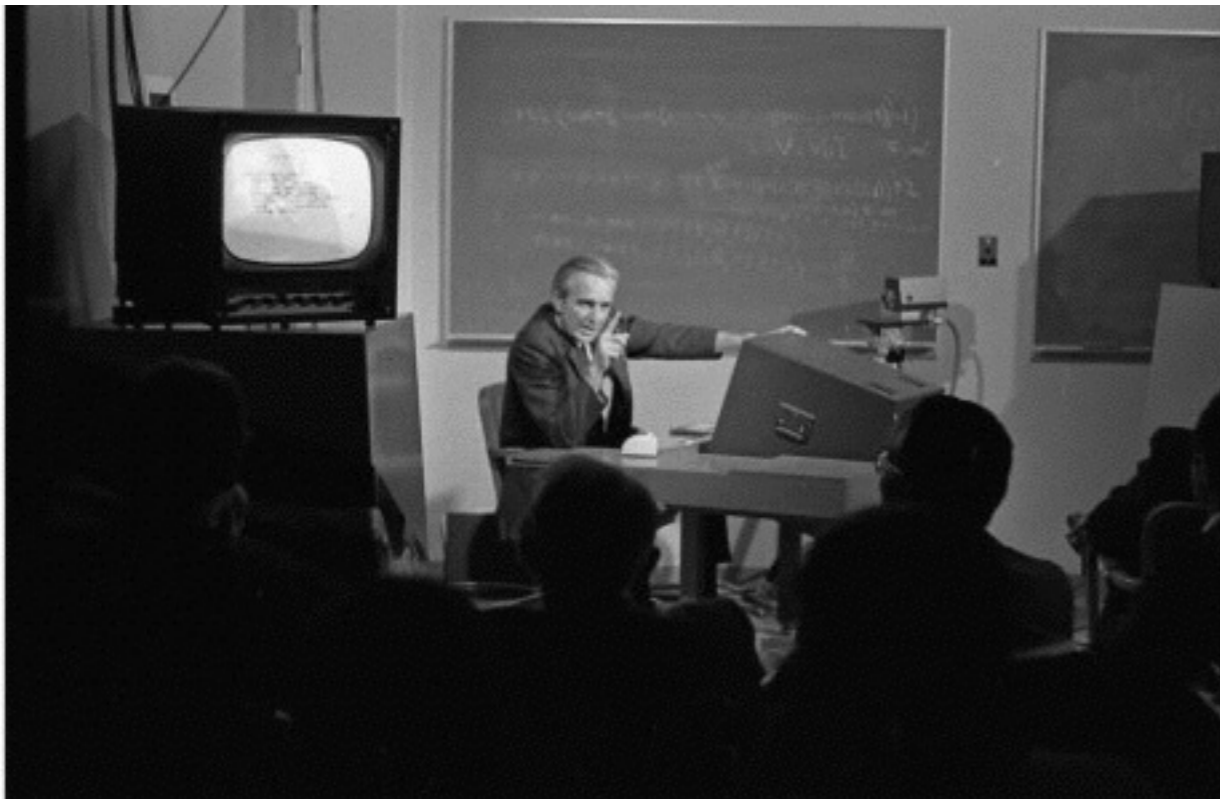


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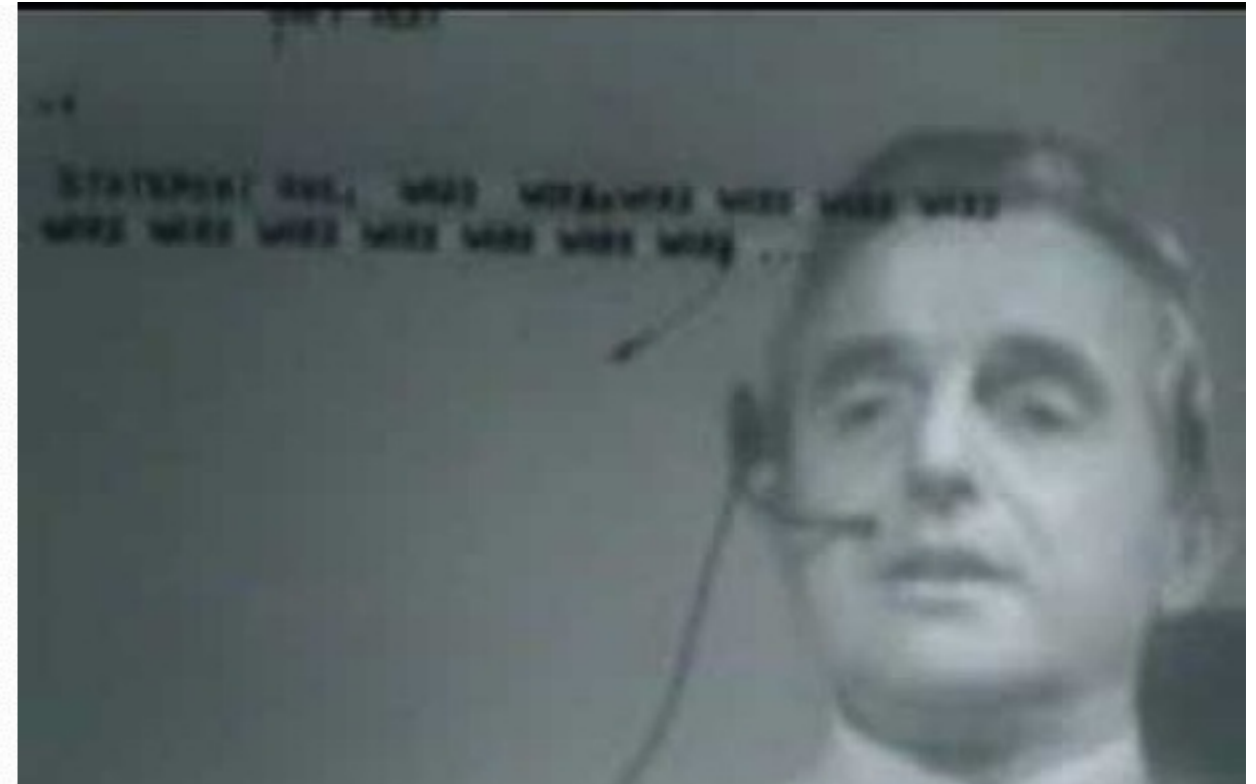
- reflection of the process (concept generation)
- construction of different prototypes (alternative design)
- iterative development of prototypes (prototyping and testing)
- tests with users to validate the approach and make decisions (usability testing)







<http://images.gizmag.com/inline/engelbart-arc-10.jpg>



<http://img.youtube.com/vi/JflgzSoTMOs/0.jpg>



[http://www.w2vr.com/timeline/15\\_Engelbart\\_demo1.jpg](http://www.w2vr.com/timeline/15_Engelbart_demo1.jpg)



[http://www.mprove.de/diplom/\\_media/fig3.2\\_NLSWorkstation.jpg](http://www.mprove.de/diplom/_media/fig3.2_NLSWorkstation.jpg)

Douglas C. Engelbart : **Augmenting human  
intellect: A Conceptual Framework**  
*Stanford Research Institute (SRI), 1962.*

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**4. Training**—the conditioning needed by the individual to bring his skills in using augmentation means 1, 2, and 3 to the point where they are operationally effective.

**The system we wish to improve can thus be visualised as comprising a trained human being, together with his artefacts, language, and methodology.**

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founded 1970 by Xerox



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<http://de.academic.ru/pictures/dewiki/80/Parcentrance.jpg>



## Stu Card

- joined Xerox Palo Alto Research Center (PARC) in 1974
- aimed at perfecting scientific methods to integrate with creative design
- developed a process to predict the behavior of a proposed design, using task analysis, approximation, and calculation
- proposed a partnership between designers and scientists, by providing a science that supports design.





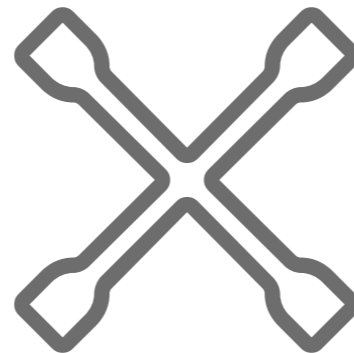
## Looking back...

-exploration of the design space through the integration of industrial design



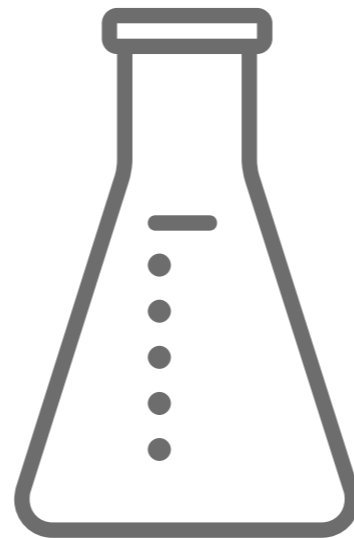
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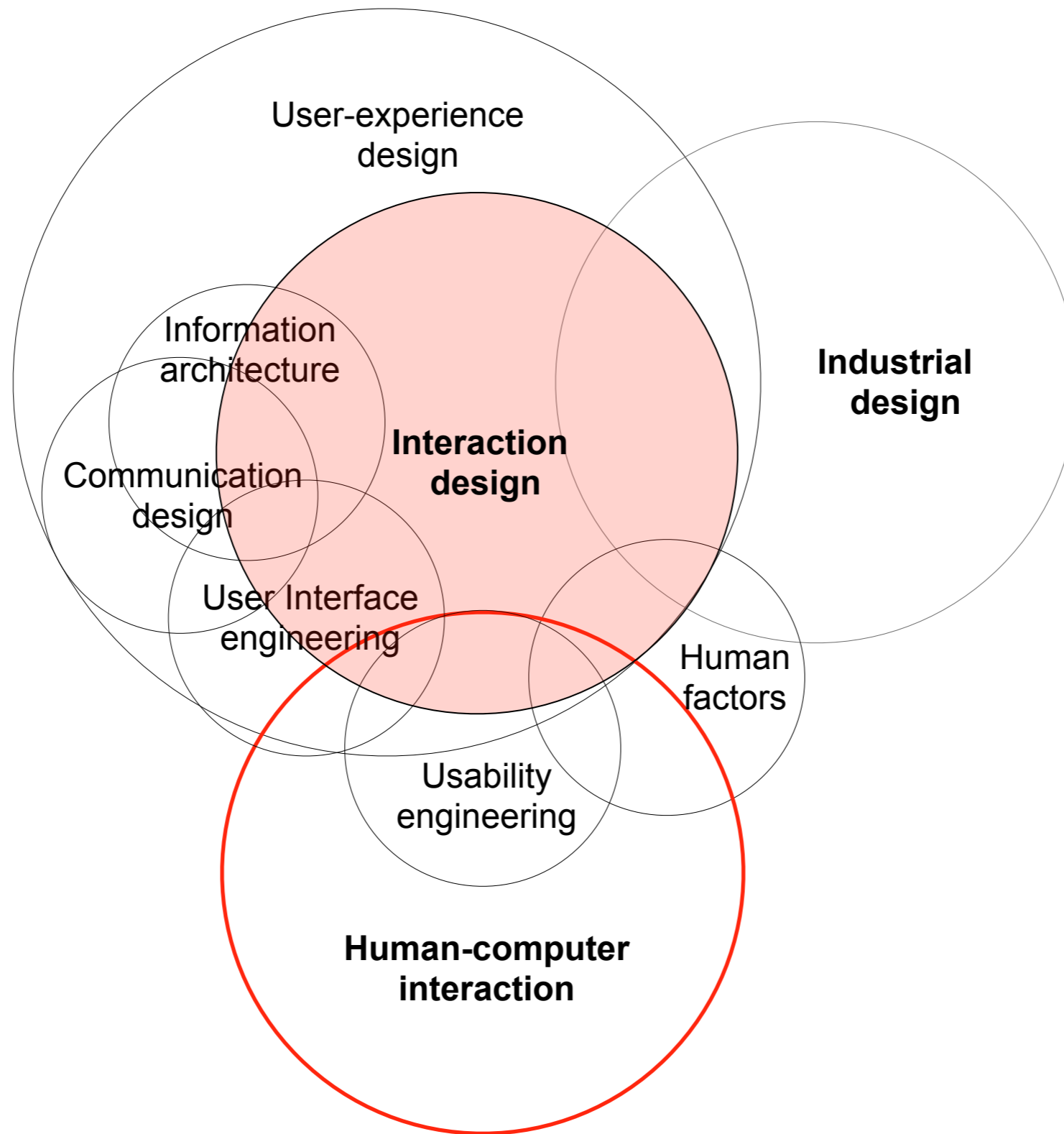
- exploration of the design space through the integration of industrial design
- designers and engineers had to work together (interdisciplinary approach)

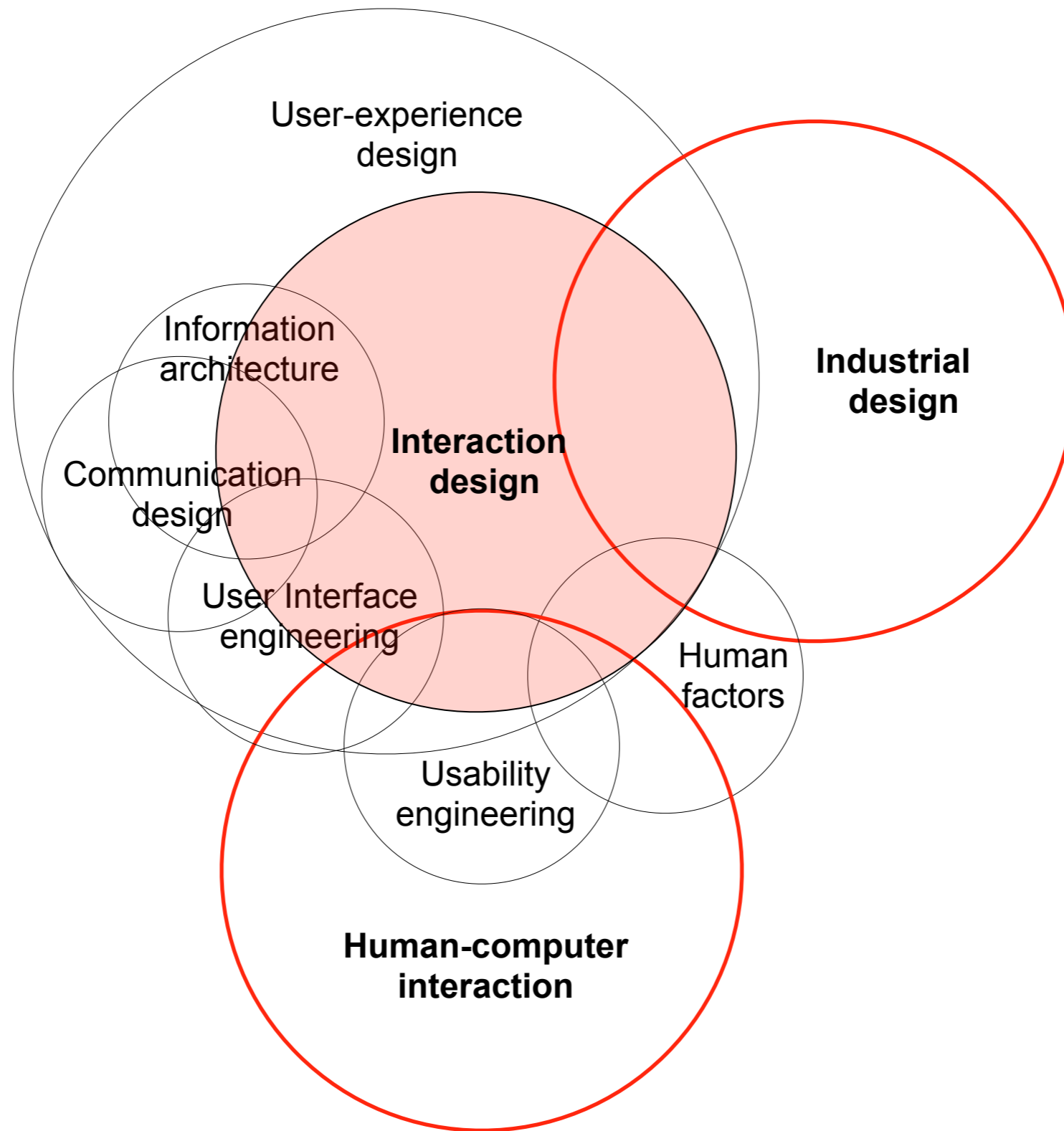


## Looking back...

- exploration of the design space through the integration of industrial design
- designers and engineers had to work together (interdisciplinary approach)
- science served to constrain the design space



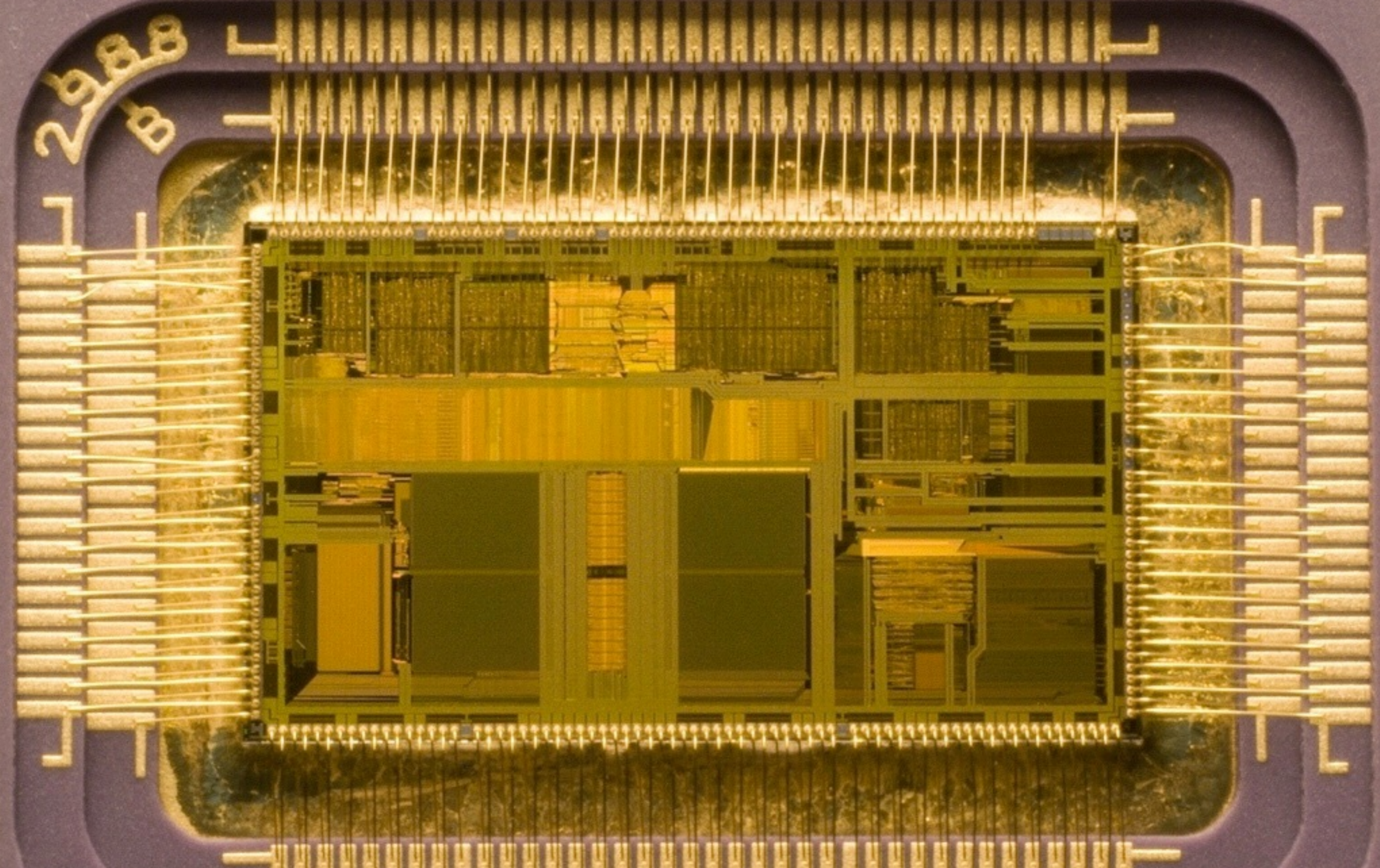




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## Microprocessor early 1970s

img src: wikimedia creative commons

## Tim Mott

- collaborated remotely with Xerox Palo Alto Research Center (PARC) and Larry Tesler
- worked on a new publishing system that included a “desktop metaphor”
- invented a “user centred design process” with Larry Tesler
- later co founded Electronic Arts (EA)



Indent for paragraph

The injured were taken to MeritCare Hospital,

Begin new paragraph

where they were treated. According to Sheriff

Eliminate paragraph

Larry Costello, none were seriously hurt.

Transpose (letters, words)

The driver of the southbound vehicle  
the spokesperson MeritCare said

Use figures (or words)

about seventeen workers attended 7 sessions

Spell out (or abbrev.)

the delegate from N.D. came to Moorhead, Minn.

Uppercase

major ed in english literature at Msum

Lowercase

Bachelor's Degree in Mass Communications

Remove space

extra effort will be required

Insert space

according to sources close to the president

Retain original

will be completed in early January

Delete

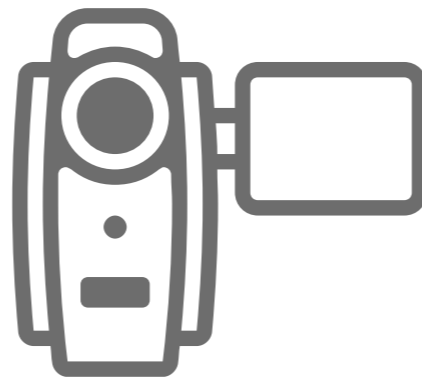
the very exciting climax of the film

Insert word

the exciting climax of the film  
winning

## Looking back...

-spending time to understand users (design research)



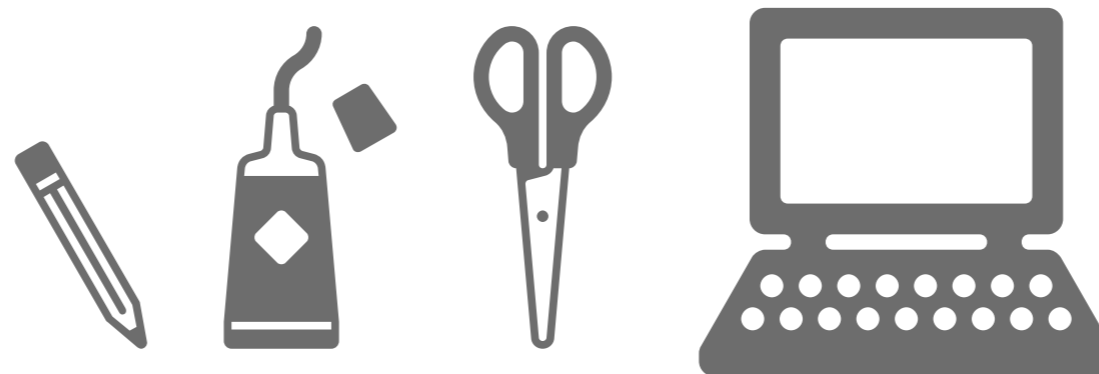
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- spending time to understand users (design research)
- designing by involving the users of the system (participatory design techniques)



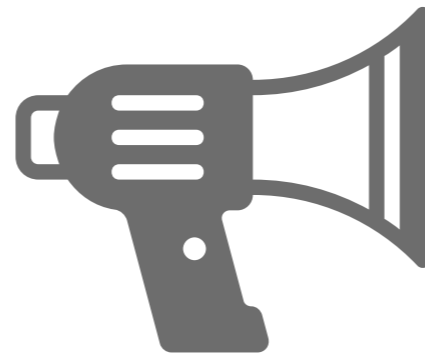
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- prototyping parts of the system with non functional elements (wizard-of-oz prototyping)



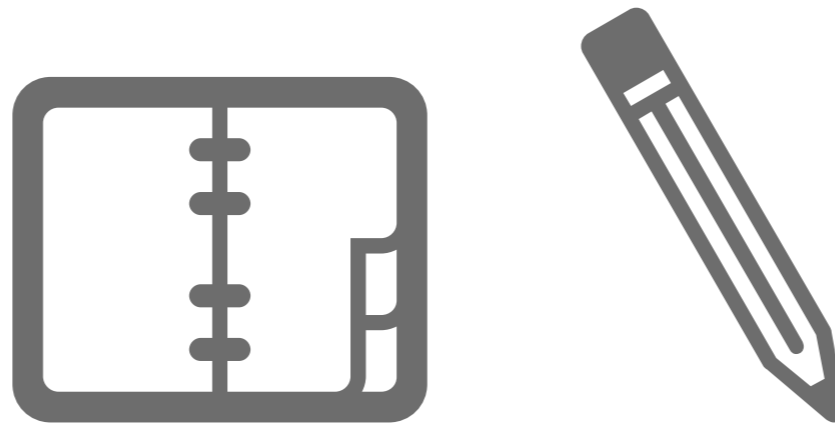
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- asking users to “walk” them through the system (think aloud method)

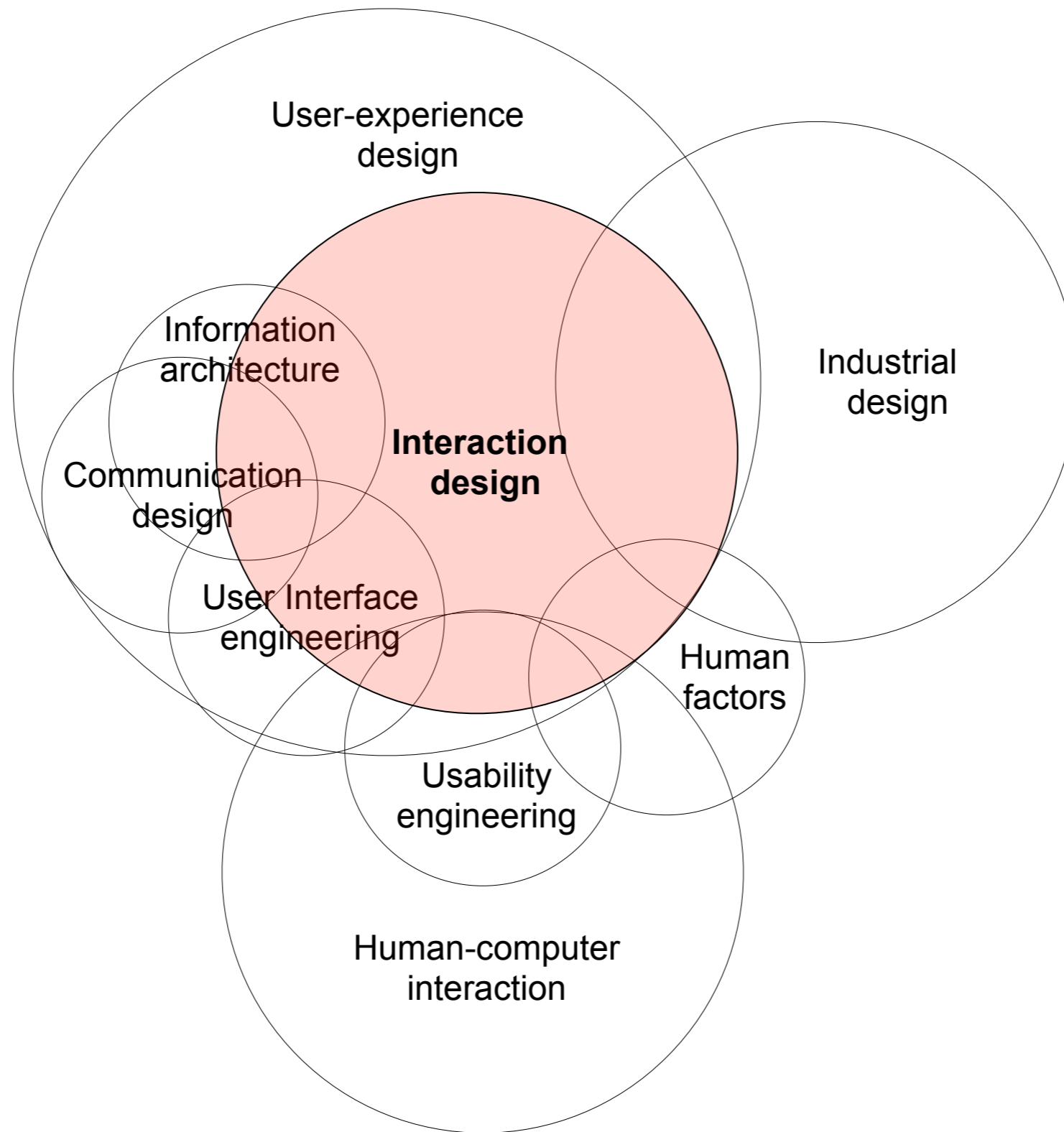


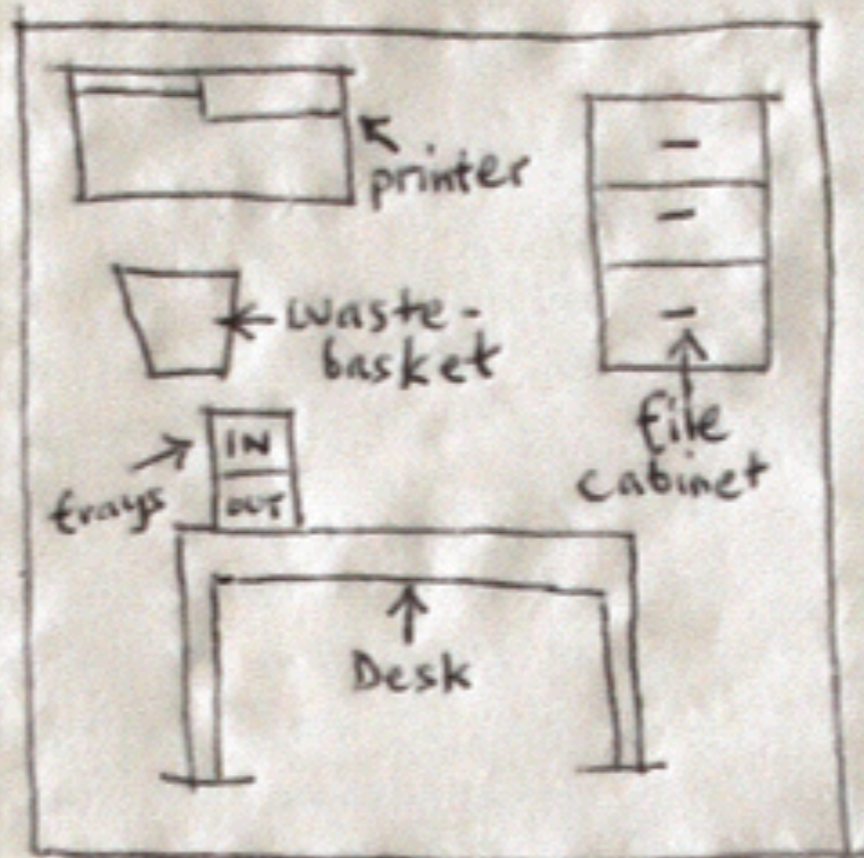
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- designing the system using mental models user could refer to (metaphors+scenarios)

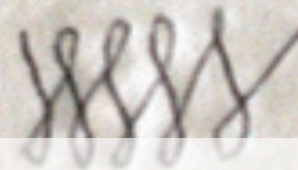








Office Schematic

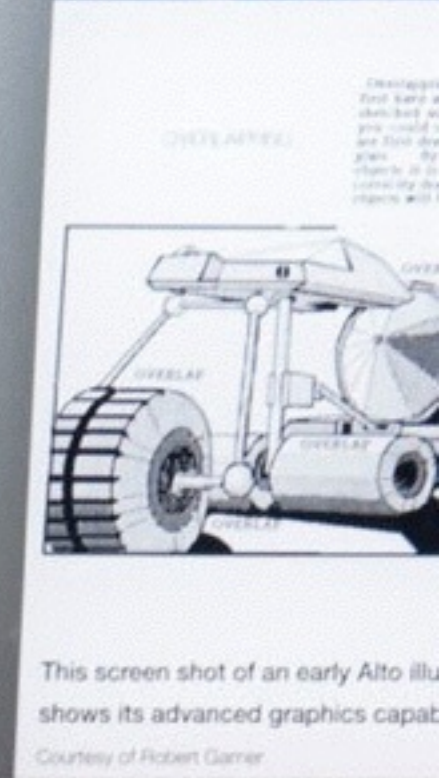


PRINT, FILE, DELETE, MAIL

all are inter-doc

# Office Schematic / Desktop Metaphor

# Xerox Alto 1973



This screen shot of an early Alto illustrates its advanced graphics capabilities. Courtesy of Robert Garner

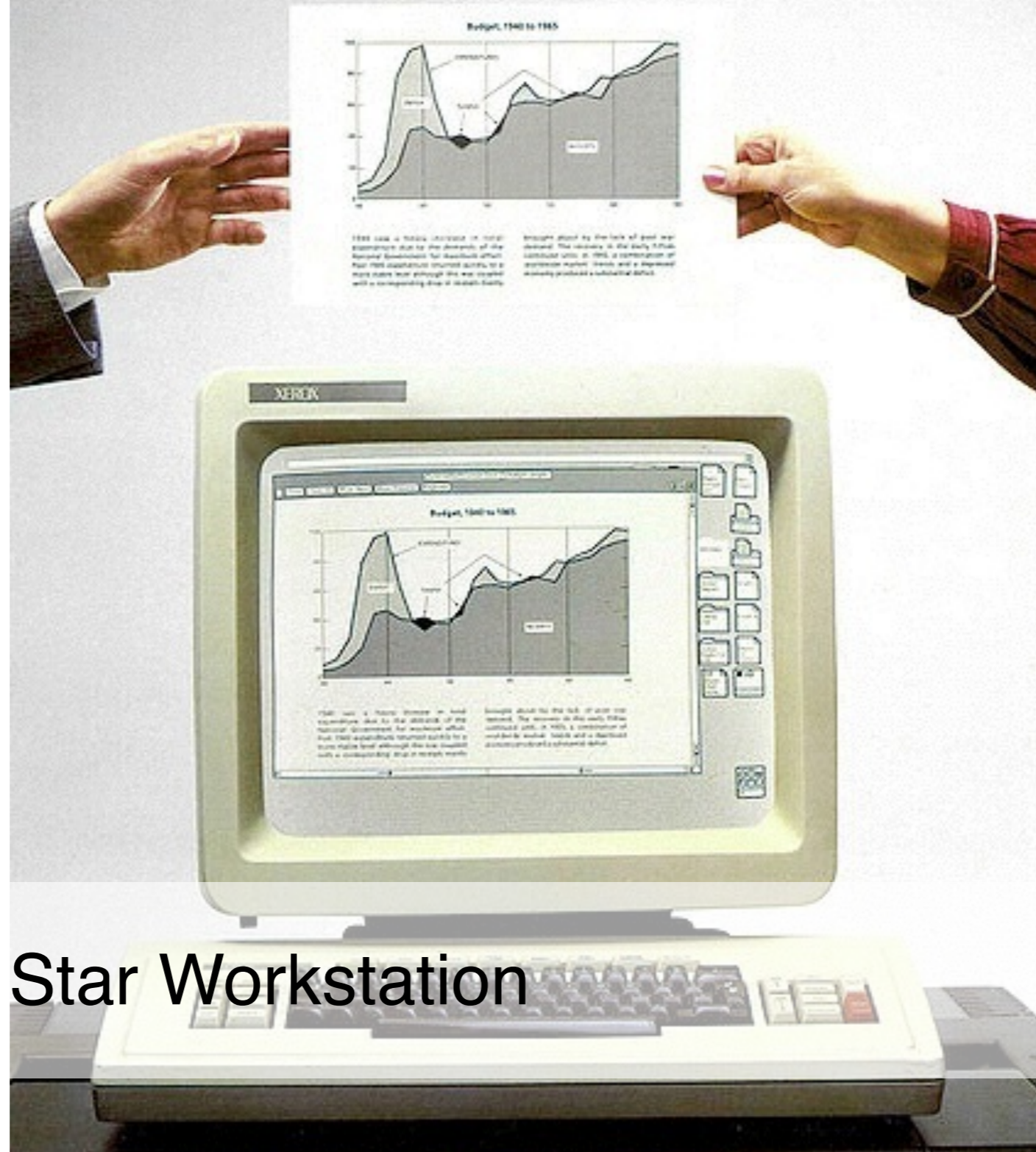
The Xerox Alto boasted the world's first "what you get" (WYSIWYG) editor, mouse, graphical user interface (GUI) and bit-mapped display. Its pop-up menu became the model for the Microsoft® Windows and Apple® Macintosh® interfaces of today. From the collection of The Computer Museum History Center

"There is no reason anyone would want a computer in their home."

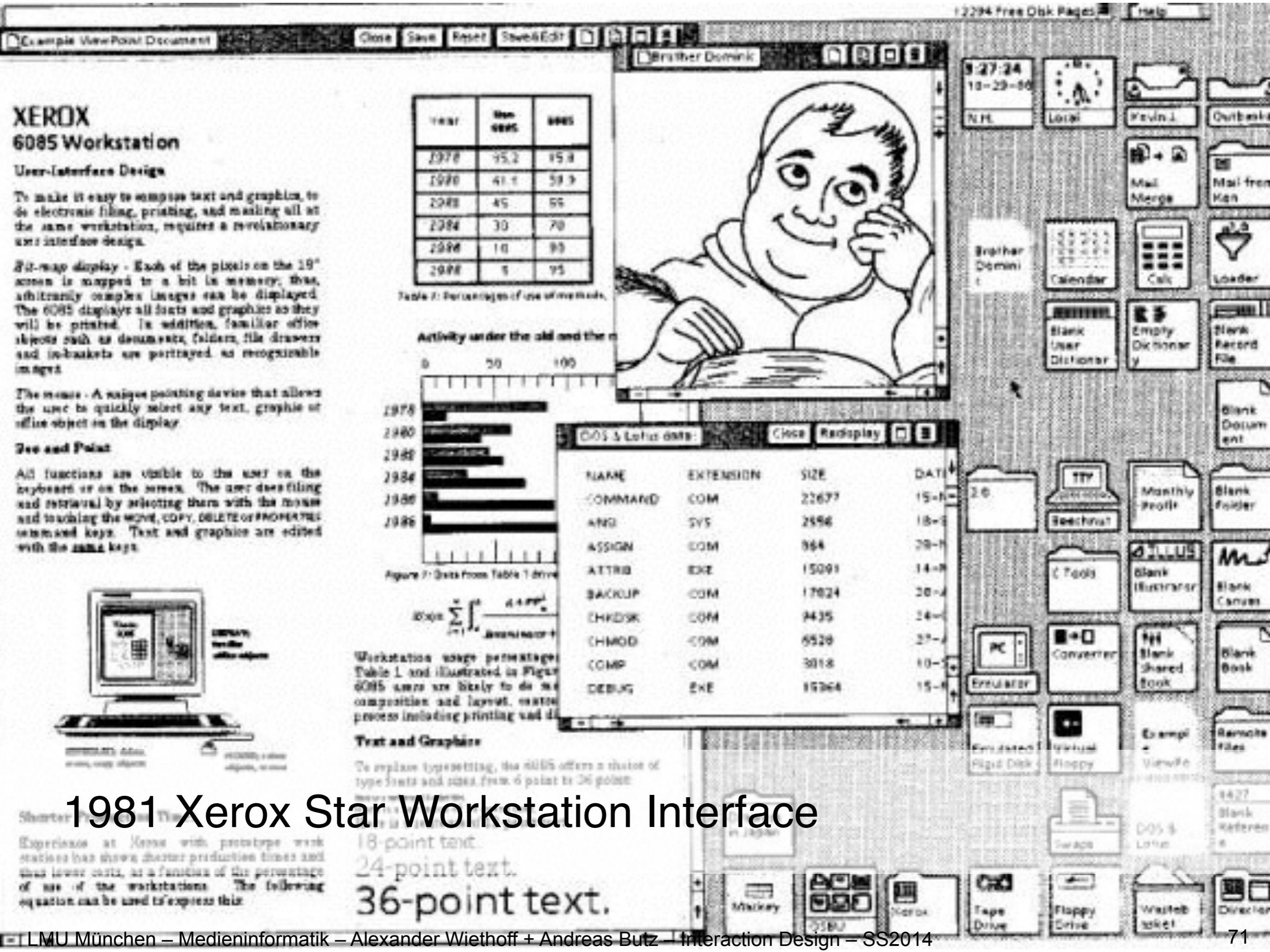
**Ken Olson,  
president, chairman and founder of DEC, 1977**



Now you can create  
documents with words  
*and* pictures



1981 Xerox Star Workstation



# XEROX 6085 Workstation

## User-Interface Design

To make it easy to compose text and graphics, to do electronic filing, printing, and mailing all at the same workstation, requires a revolutionary user interface design.

**Bit-map display** - Each of the pixels on the 19" screen is mapped to a bit in memory; thus, arbitrarily complex images can be displayed. The 6085 displays all text and graphics as they will be printed. In addition, familiar office objects such as documents, folders, file drawers and wastebaskets are portrayed as recognizable images.

**The mouse** - A unique pointing device that allows the user to quickly select any text, graphic or office object on the display.

## See and Point

All functions are visible to the user on the keyboard or on the screen. The user does filing and retrieval by ariving them with the mouse and touching the MOVE, COPY, DELETE or PROPERTIES command keys. Text and graphics are edited with the same keys.



YEAR	Non-GRAPH	GRAPH
1978	95.2	15.8
1980	41.1	58.3
1982	45	55
1984	30	70
1986	10	90
1988	5	95

Table 1: Percentages of use of methods.

Activity under the old and the new

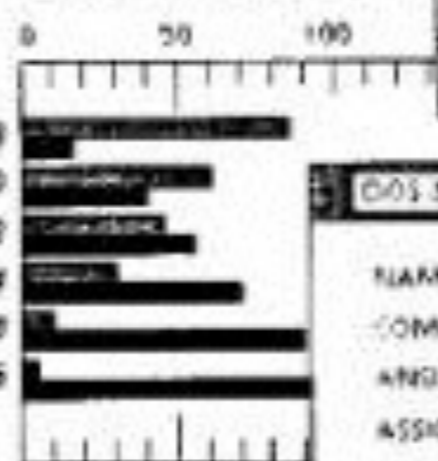


Figure 1: Data from Table 1 drive

$$Workstation usage percentage = \frac{\sum_{i=1}^n \sum_{j=1}^m \frac{A_{ij}}{A_{total}}}{\sum_{i=1}^n \sum_{j=1}^m \frac{A_{ij}}{A_{total}}}$$

Workstation usage percentages Table 1 and illustrated in Figure 1. 6085 users are likely to do more composition and layout, more process including printing and distribution.

## Text and Graphics

To replace typesetting, the 6085 offers a choice of type faces and sizes from 6 point to 36 point.

18-point text.  
24-point text.  
36-point text.



NAME	EXTENSION	SIZE	DATE
COMMAND	COM	22677	15-11
AND	SYS	2556	18-11
ASSIGN	COM	864	28-11
ATTRIB	EXE	15091	14-12
BACKUP	COM	17824	28-12
CHKDSK	COM	4435	14-12
CHMOD	COM	6528	27-12
COMP	COM	3818	10-12
DEBUG	EXE	19264	15-12

Shorter Production Times  
Experience at Xerox with prototype work stations has shown shorter production times and thus lower costs, as a function of the percentage of use of the workstations. The following equation can be used to express this:

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## Larry Tesler

- involved users also in the software design process
- joined PARC in 1973
- moved to Apple in 1980
- was the core designer of Apples “Lisa” computer
- invented the “copy and paste” function



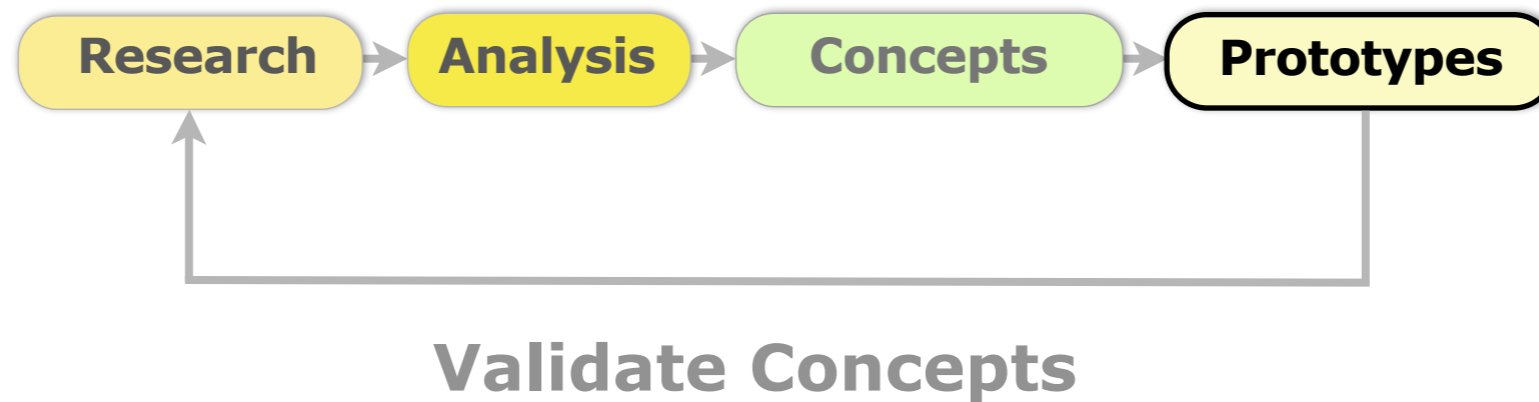
## Text Selection

So it became a kind of contest. An unofficial and completely unacknowledged competition to see which of us was the toughest, the coolest, the hardest to get. (He was, but there were times when he didn't know that.) **Who is smarter, you or me?** he asked me again and again: once as he left the apartment in the morning, me wrapped in a towel; once over our whiskies at the King Cole Bar in the St. Regis. And that became the most important question. 

EDIT: Copy Insert Delete Search Replace Font Undo

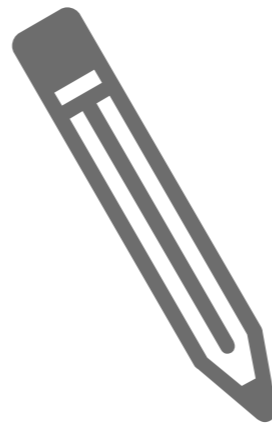
## Looking back...

-brainstorming and iterative trying and testing (iterative design process)



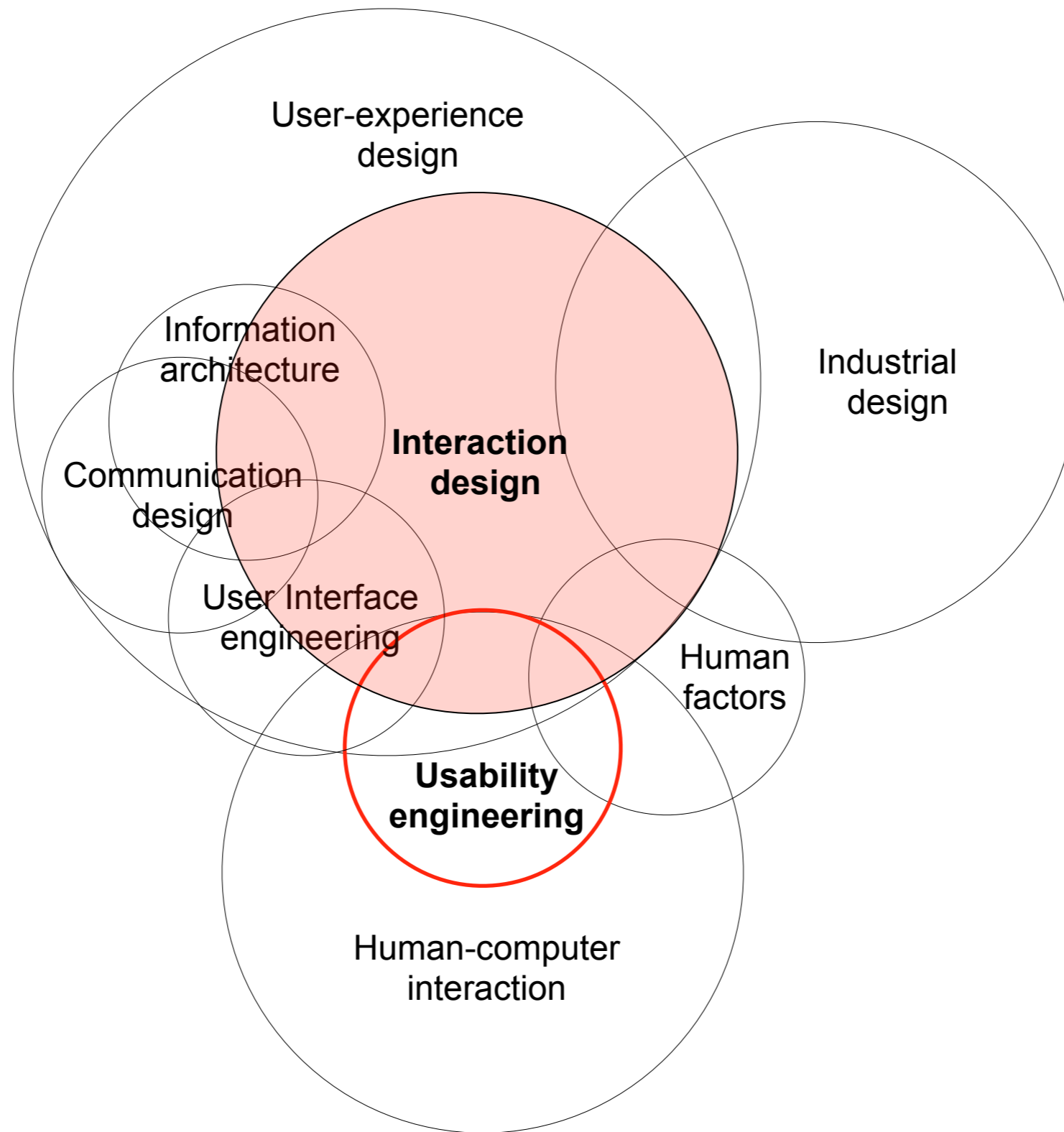
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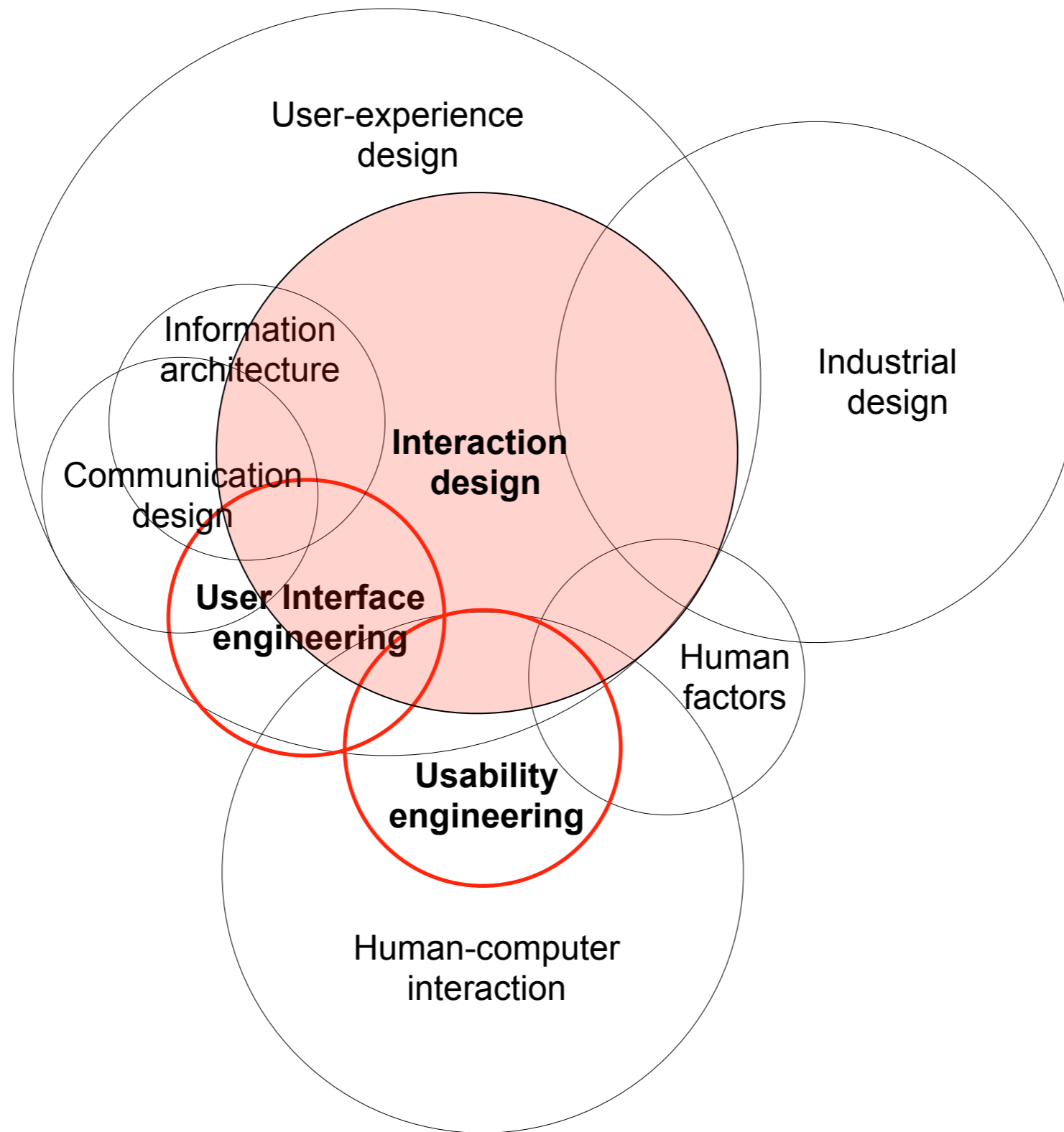
- brainstorming and iterative trying and testing (iterative design process)
- constant, quick and efficient tests with users to improve the system (experience prototyping)

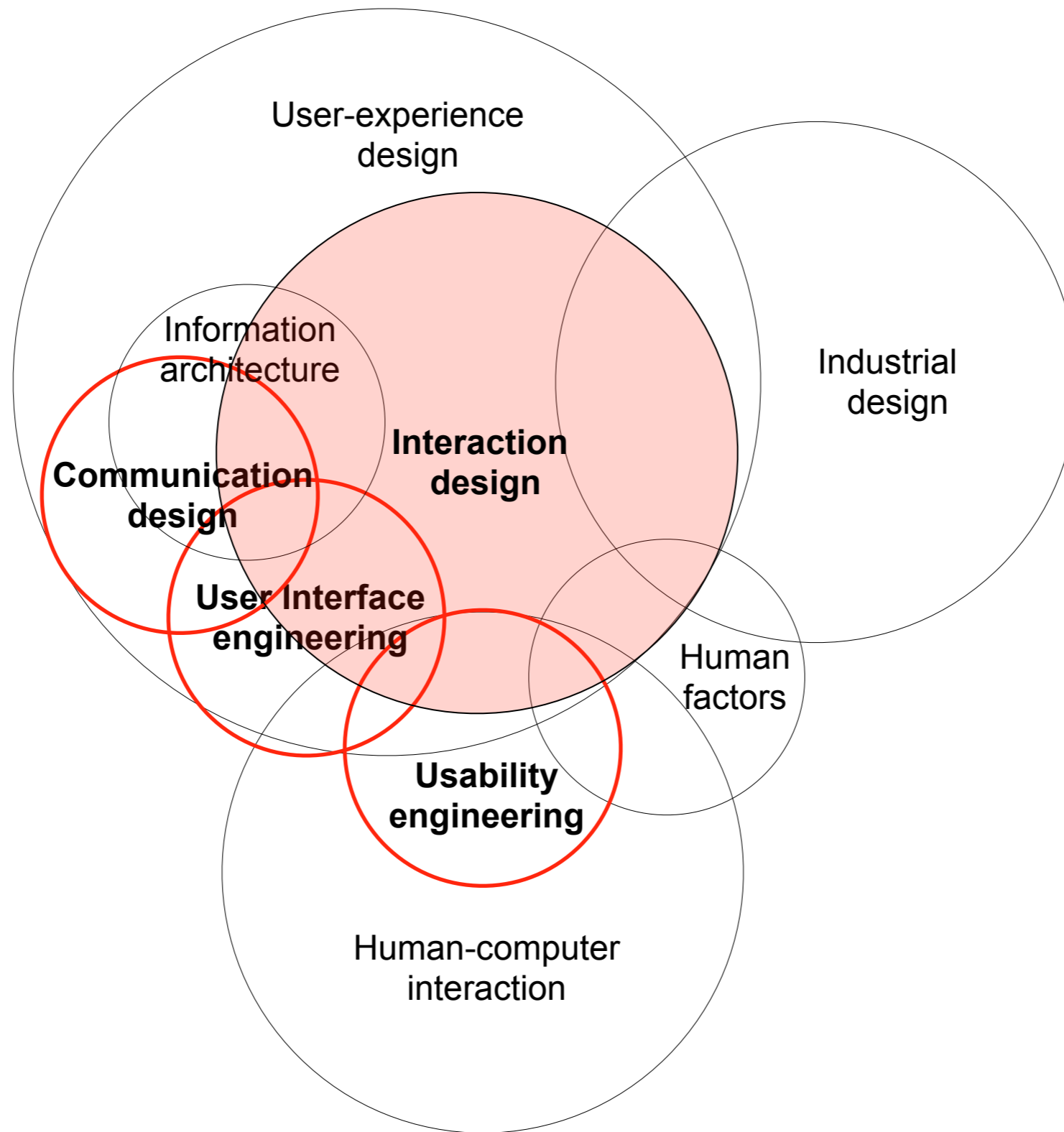


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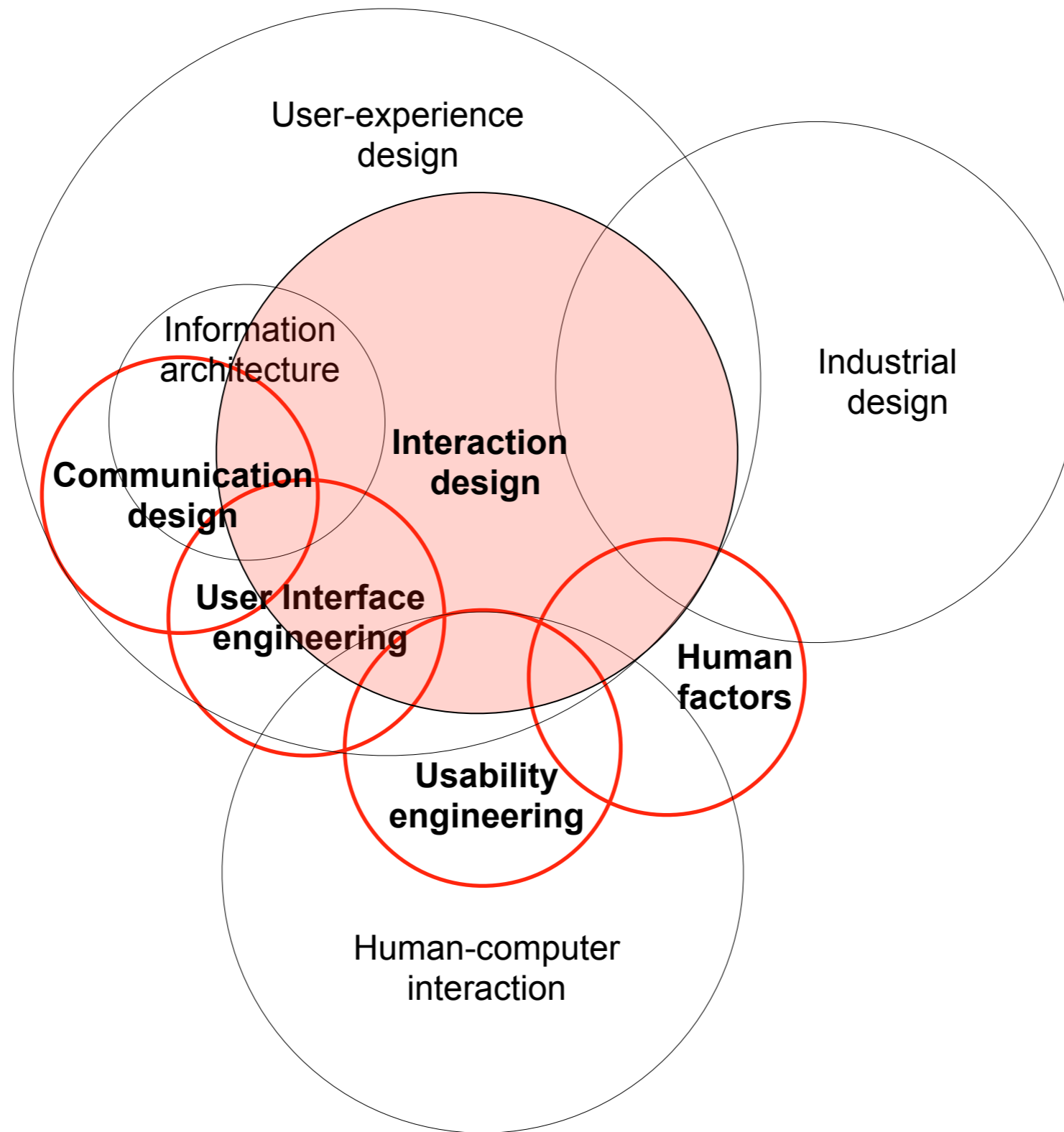
- brainstorming and iterative trying and testing (iterative design process)
- constant, quick and efficient tests with users to improve the system (experience prototyping)
- developing products for the users' core needs (user centred design process)











## Bill Atkinson

- was hired by Apple as the “Application Software Department”
- invented the “pull down” menu structure
- was the lead designer of the “Lisa” and the initial “Mac”





## Looking back...

-alternative designs in a variety (sketches & prototypes)

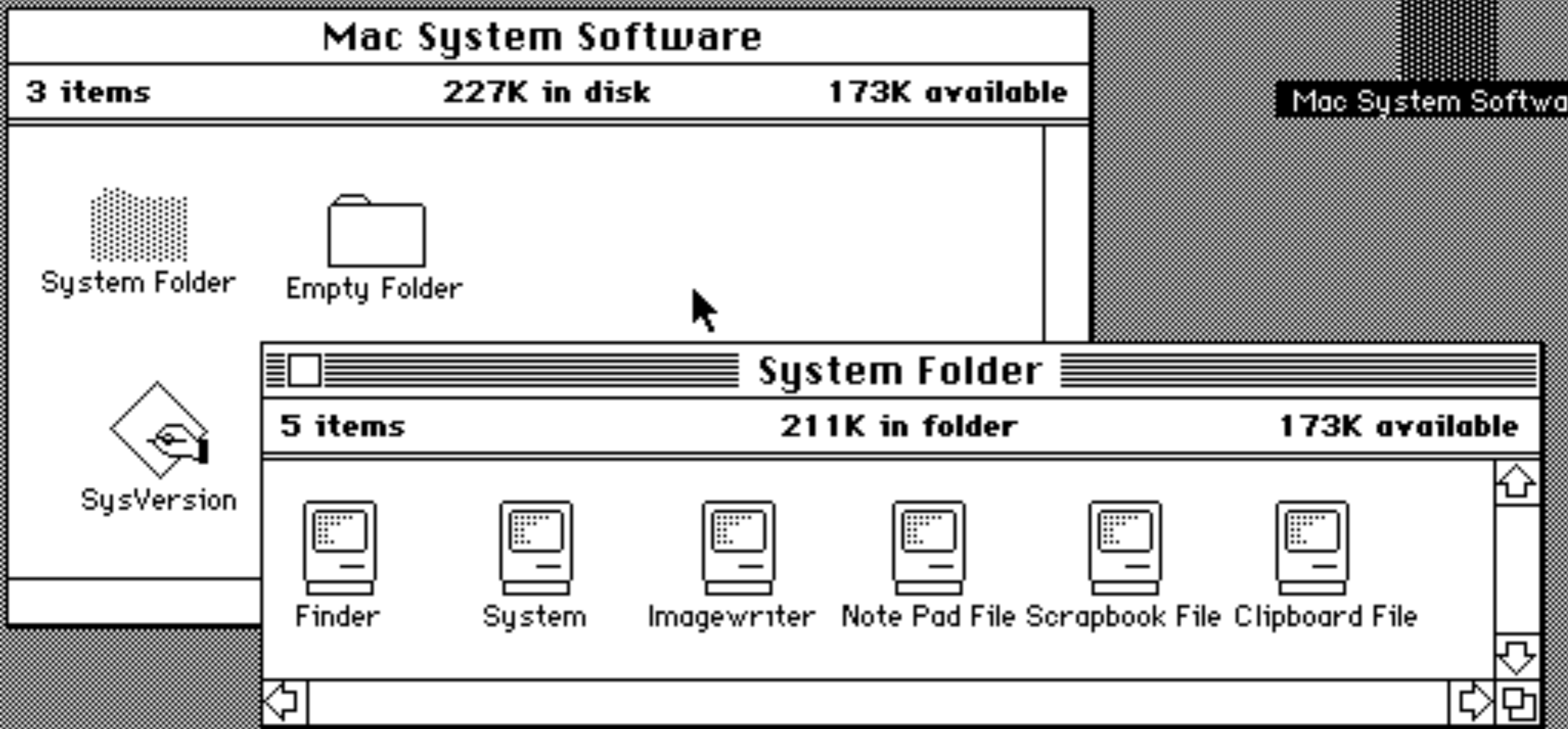
## Looking back...

- alternative designs in a variety (sketches & prototypes)
- proposal of a participatory design approach, creating better UIs

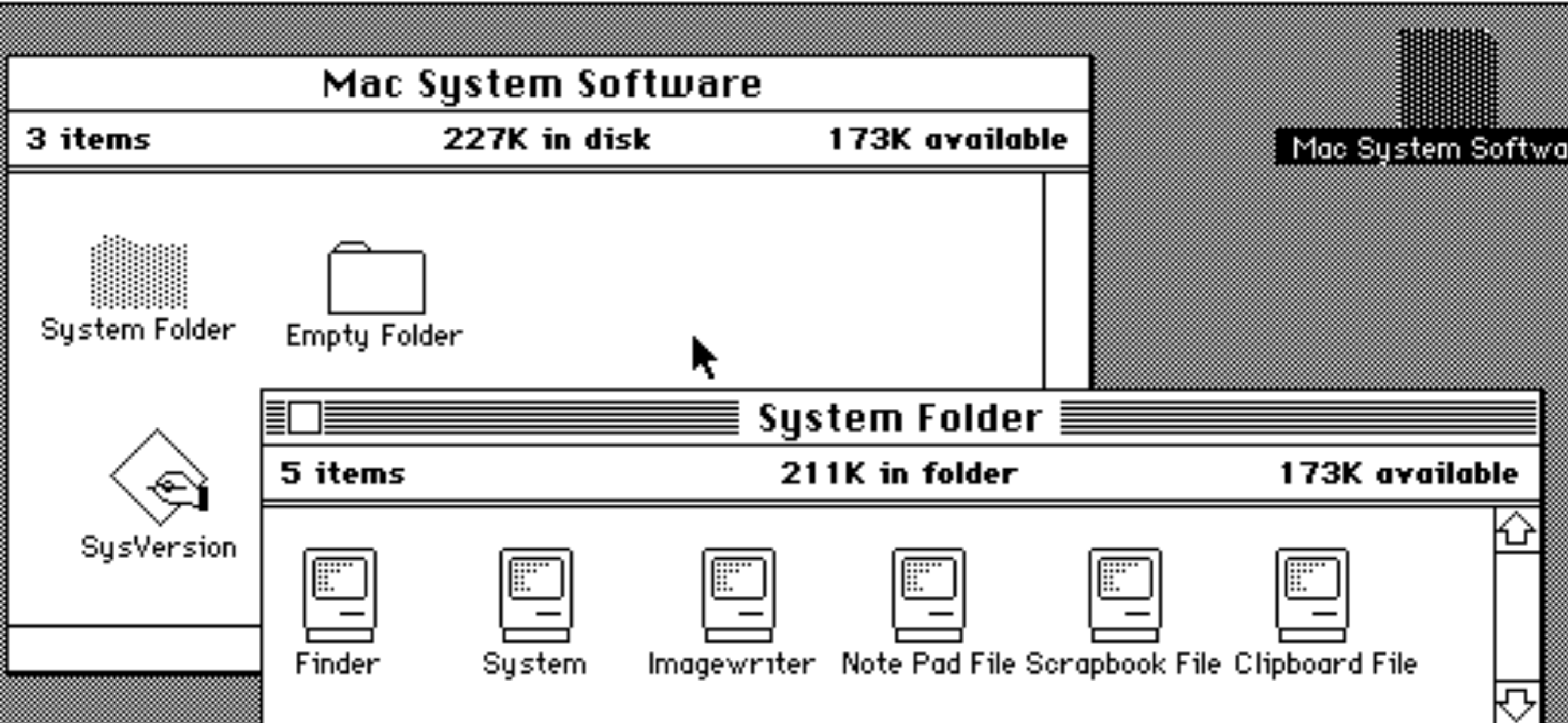


# Apple Lisa 1983

<http://media.arstechnica.com/images/gui/11-Mac1.gif>



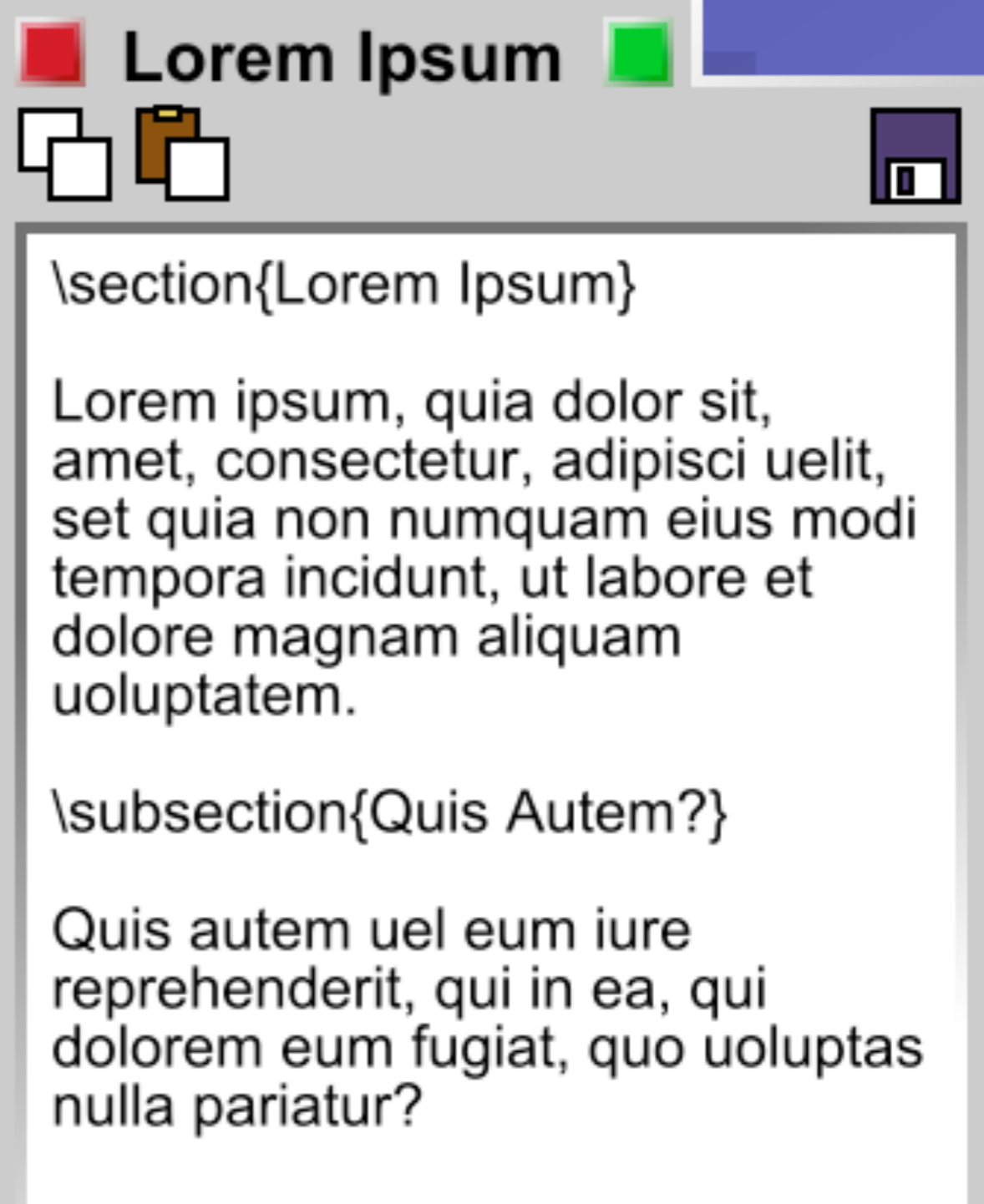
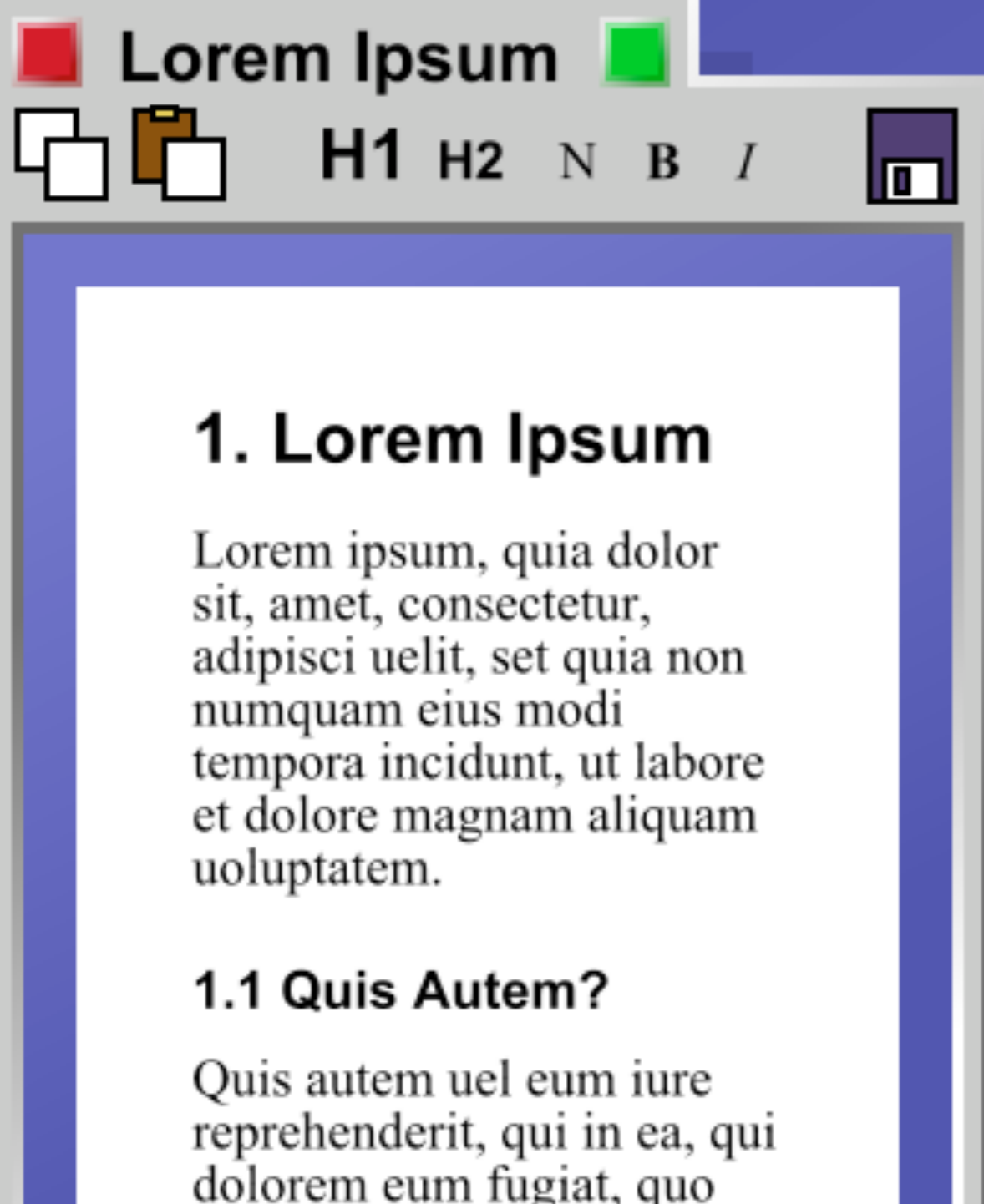
# Macintosh System 1.0. January 1984



## WIMP

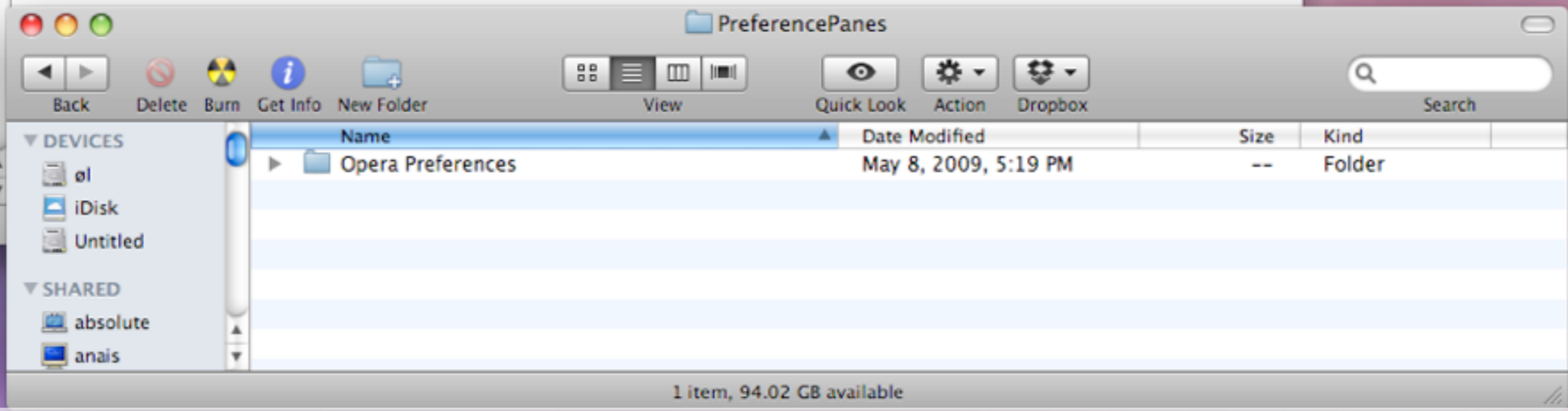
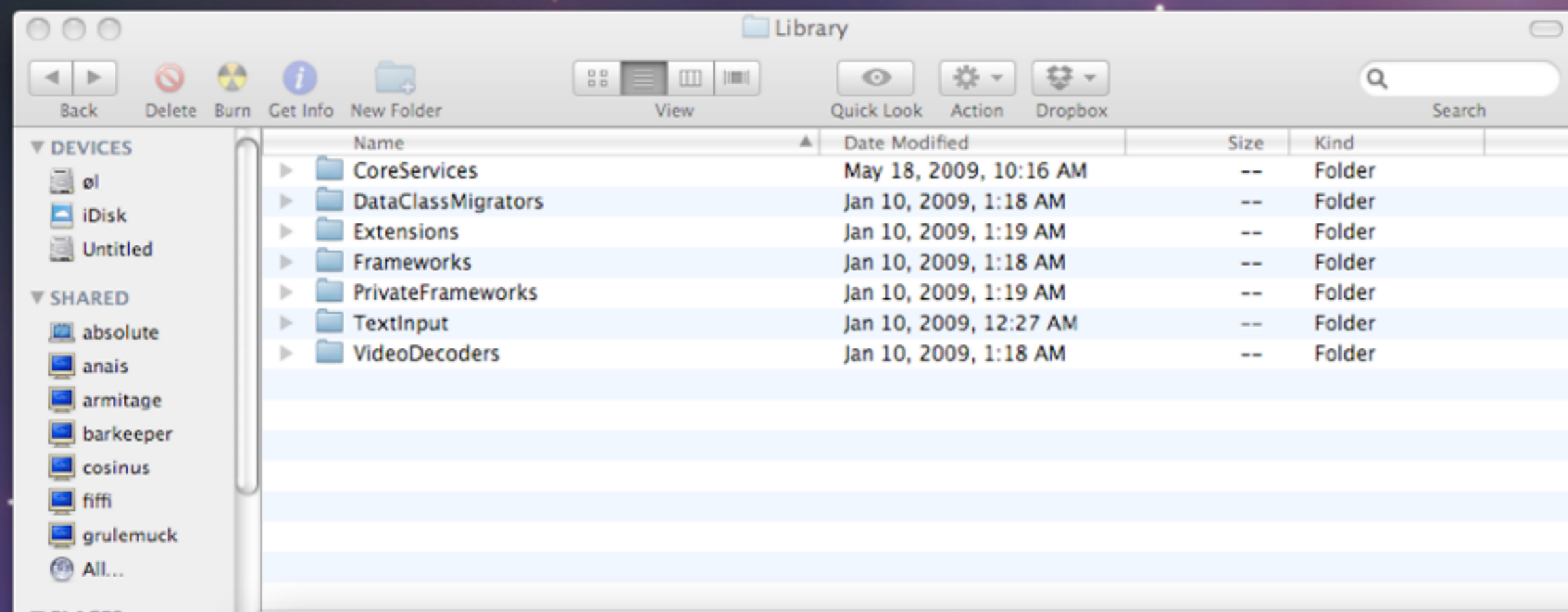
- stands for "window, icon, menu, pointing device"
- coined by Merzouga Wilberts in 1980
- is often incorrectly used as an approximate synonym of "GUI".



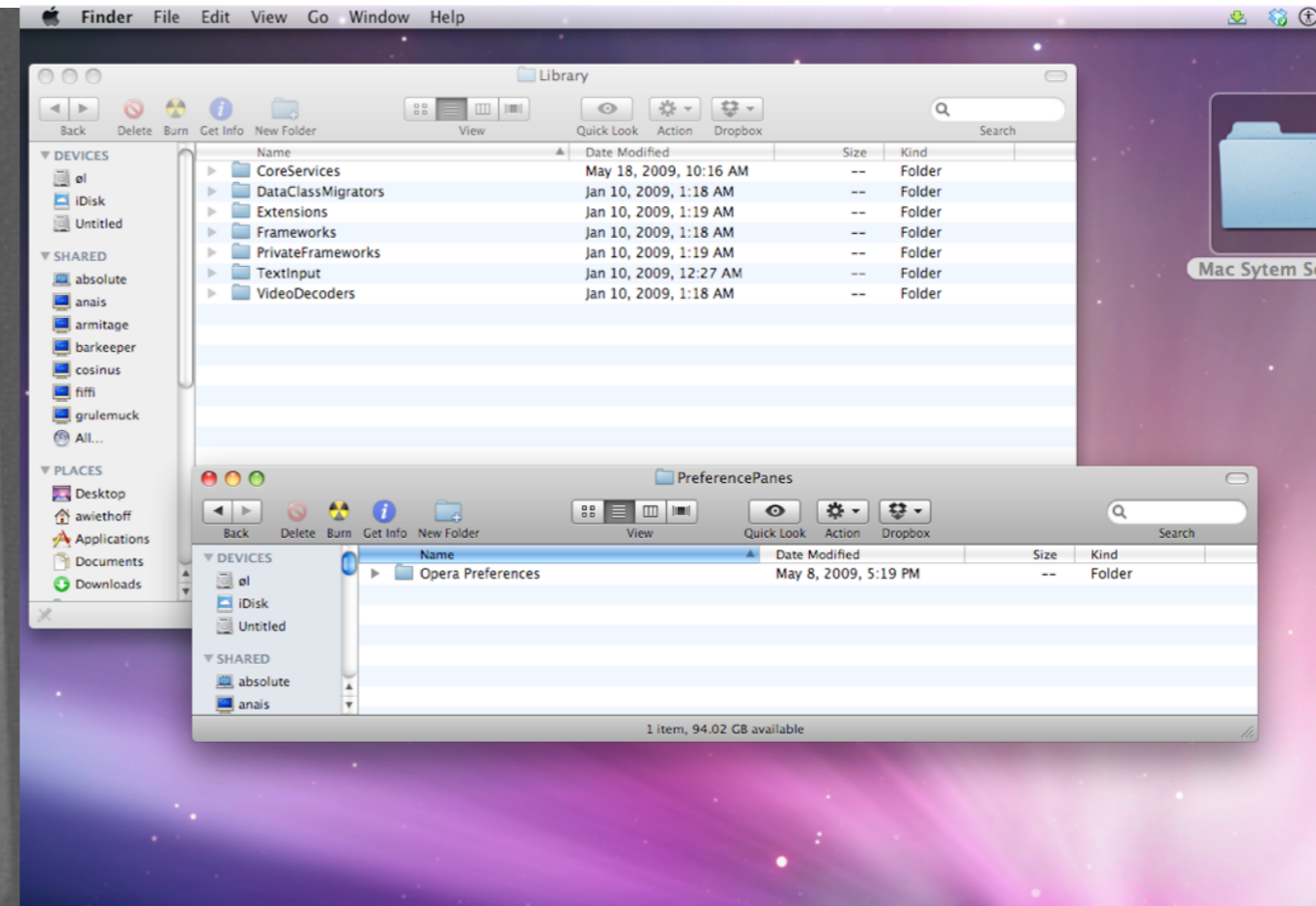
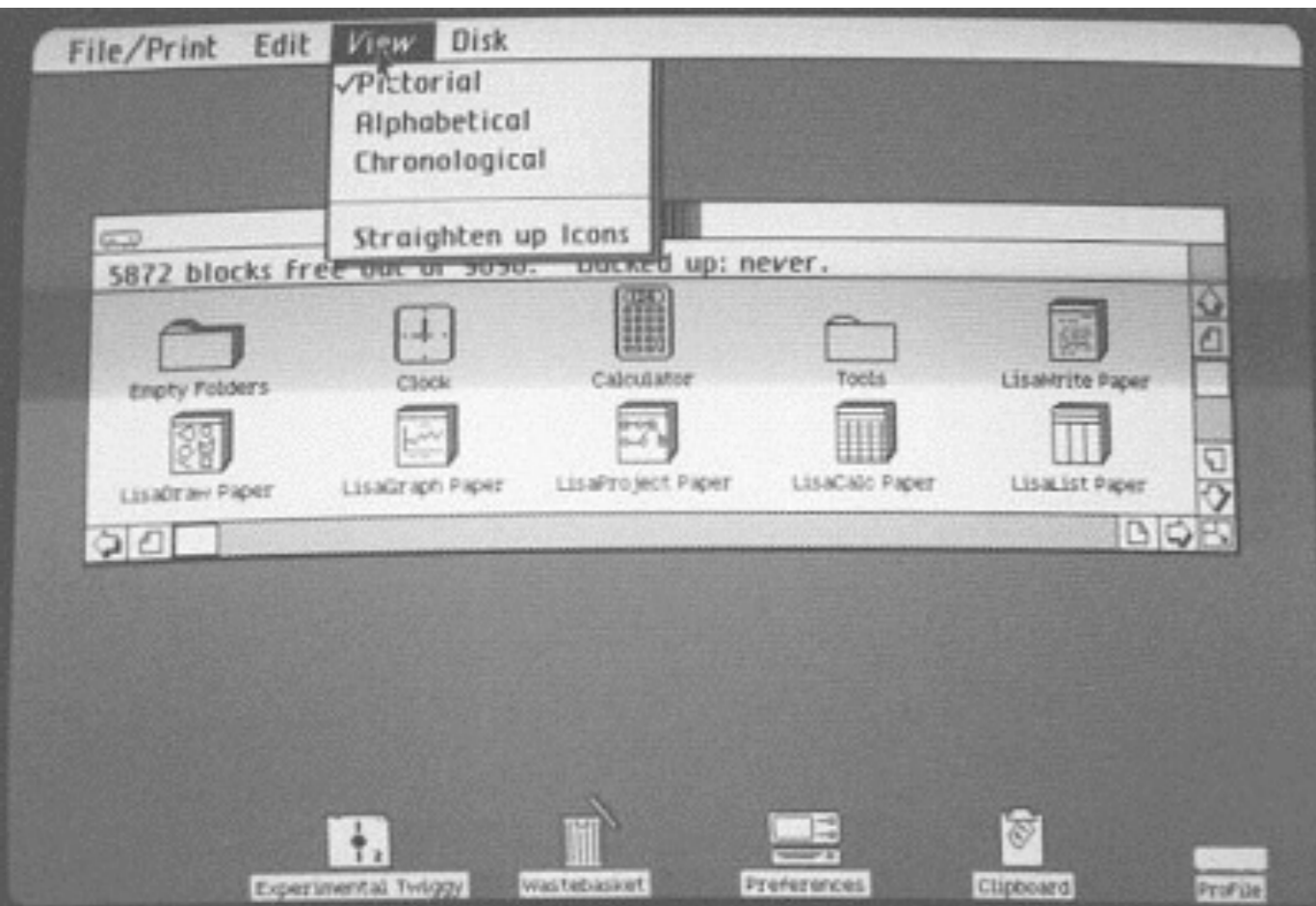


## WYSIWYG

- user interface that allows the user to view something very similar to the end result
- implies the ability to directly manipulate the layout of a document/presentation/3D model without having to type or remember names of layout commands.



# October 2007: Mac OS X 10.5



over 25 years in between....

# INTERACTION DESIGN



“There is an objectivity in the process of letting the user decide, the value of which is a recurring theme in this story of designing the desktop and the mouse. **Come up with an idea, build a prototype, and try it on the intended users.** That has proved, time and time again, to be the best way to create innovative solutions.”

**Bill Moggridge - Designing Interactions**

## References (Books):

- [1] Buxton, W. Sketching User Experiences, *Morgan Kaufmann 2007.*
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- [3] Saffer, D. Designing for Interaction, *New Riders 2009.*

## References (Papers):

- [4] Sanders, E. An Evolving Map of Design Practice and Design Research. *In ACM Interactions 15,6 2008*
- [5] Sanders, E. Stepping Stones Across the Gap. Essay in DAIM – Rehearsing the Future, *DKDS Press 2010.*

## Articles:

- [6] [http://www.businessweek.com/innovate/next/archives/2008/12/what\\_apple\\_lear.html](http://www.businessweek.com/innovate/next/archives/2008/12/what_apple_lear.html)

