

# Interaction Design

Chapter 1 (May 4, 2011, 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

- close to the lecture, rather theoretical (cf. Concept Development)
- no bonus!
- tutorial important preparation for exam
- Interaction Design required for Concept Development
- registration via UniWorx for tutorials starts: Today, 4th of May 13:00
- exam: Monday, 1st of August, 14:00-16:00
- no podcast

## Course Overview:

I History & Fundamentals

May

June

July

## Course Overview:

II Applying Interaction Design

May

June

July

## Course Overview:

III Beyond the Desktop

May

June

July

# History

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

## 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...

- shaping our lives through digital artifacts...
- 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

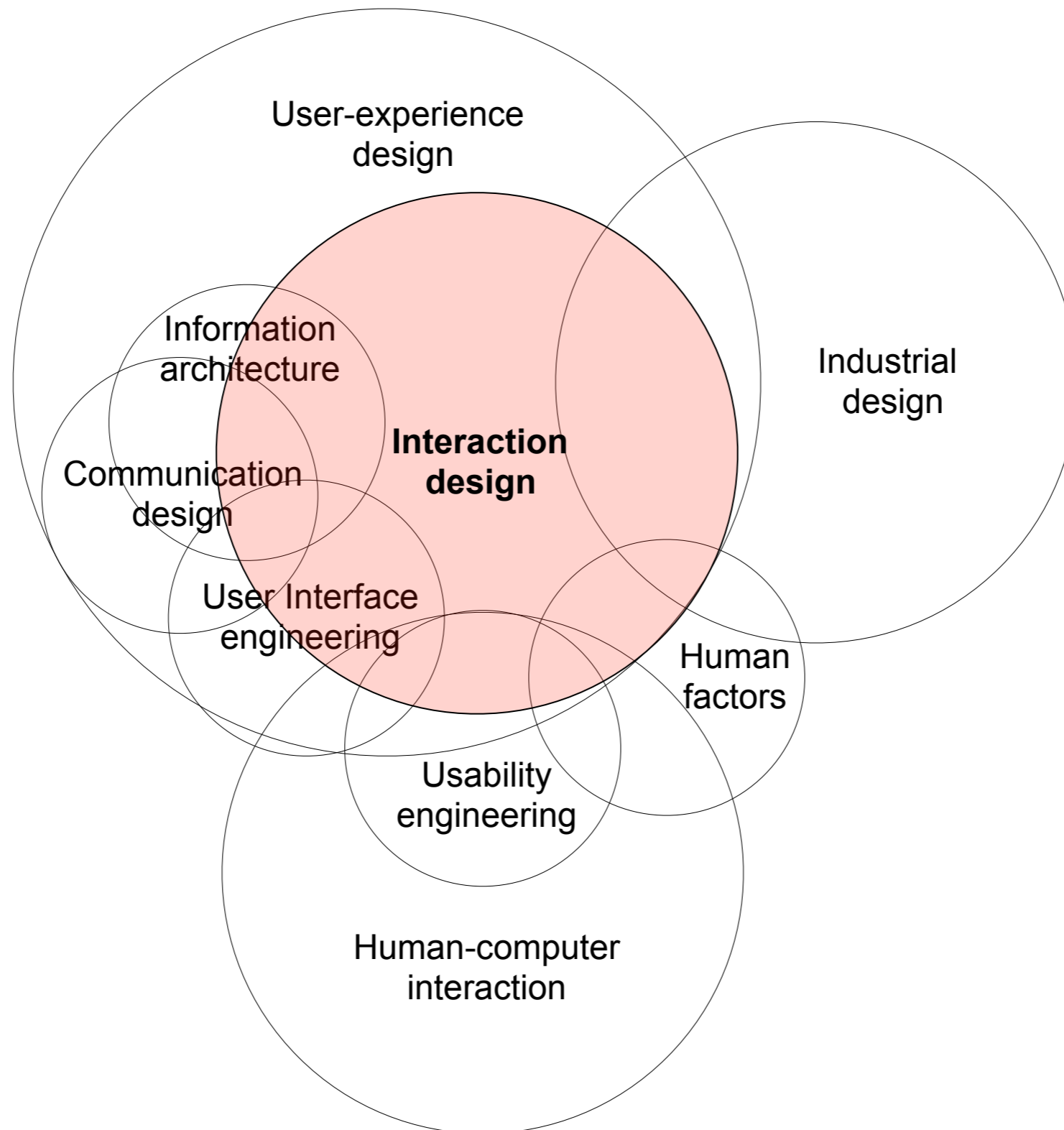
**(1)** Larger user groups  
(e.g. Kids/Parents/  
Grandparents)

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



**25 years ago**

**today**



source: [3]

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

**Bill Buxton**

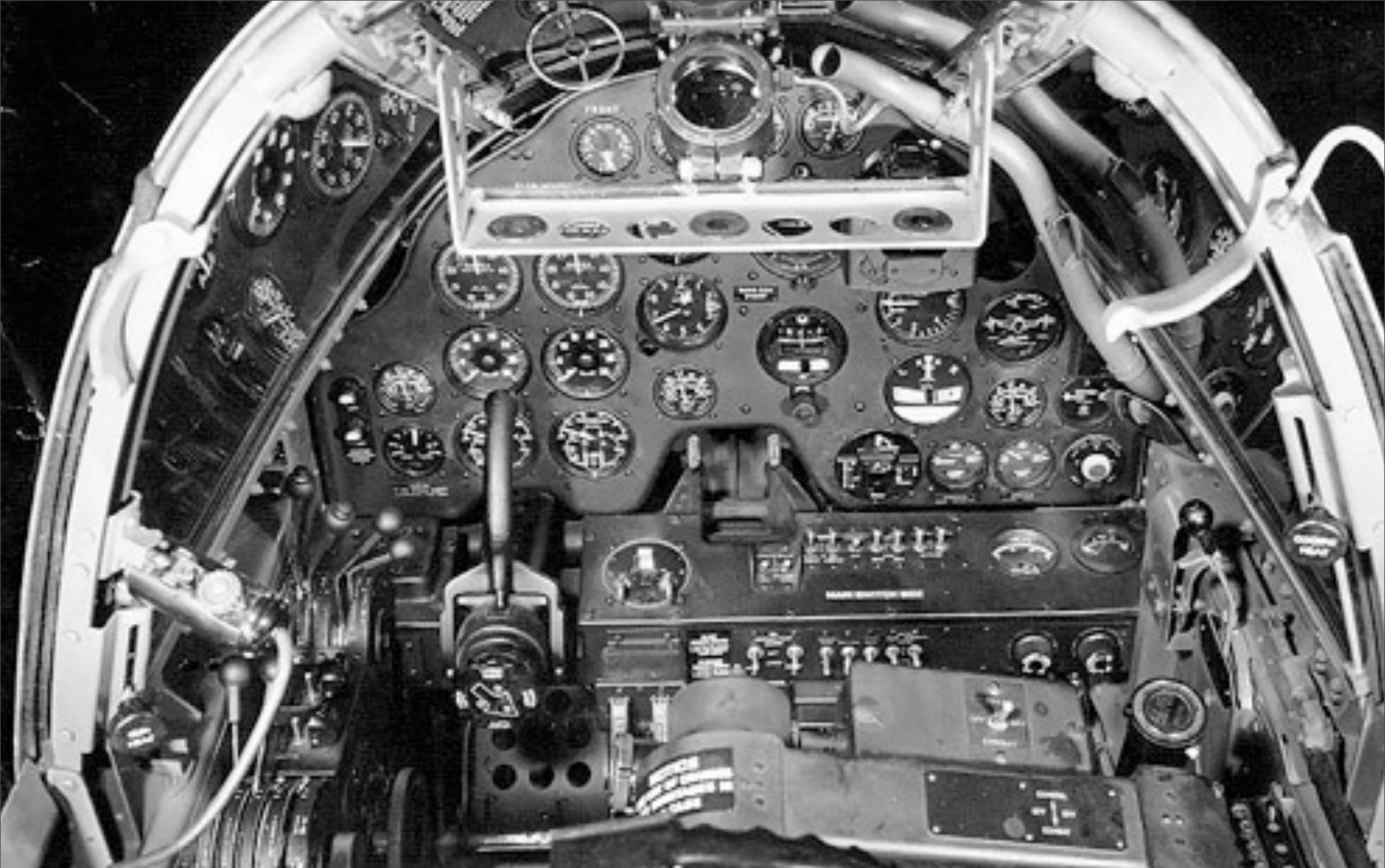
source: [6]

# History

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

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





## P 38 Lightning Cockpit (1943)

<http://www.world-war-2-planes.com/lockheed-p-38.html>

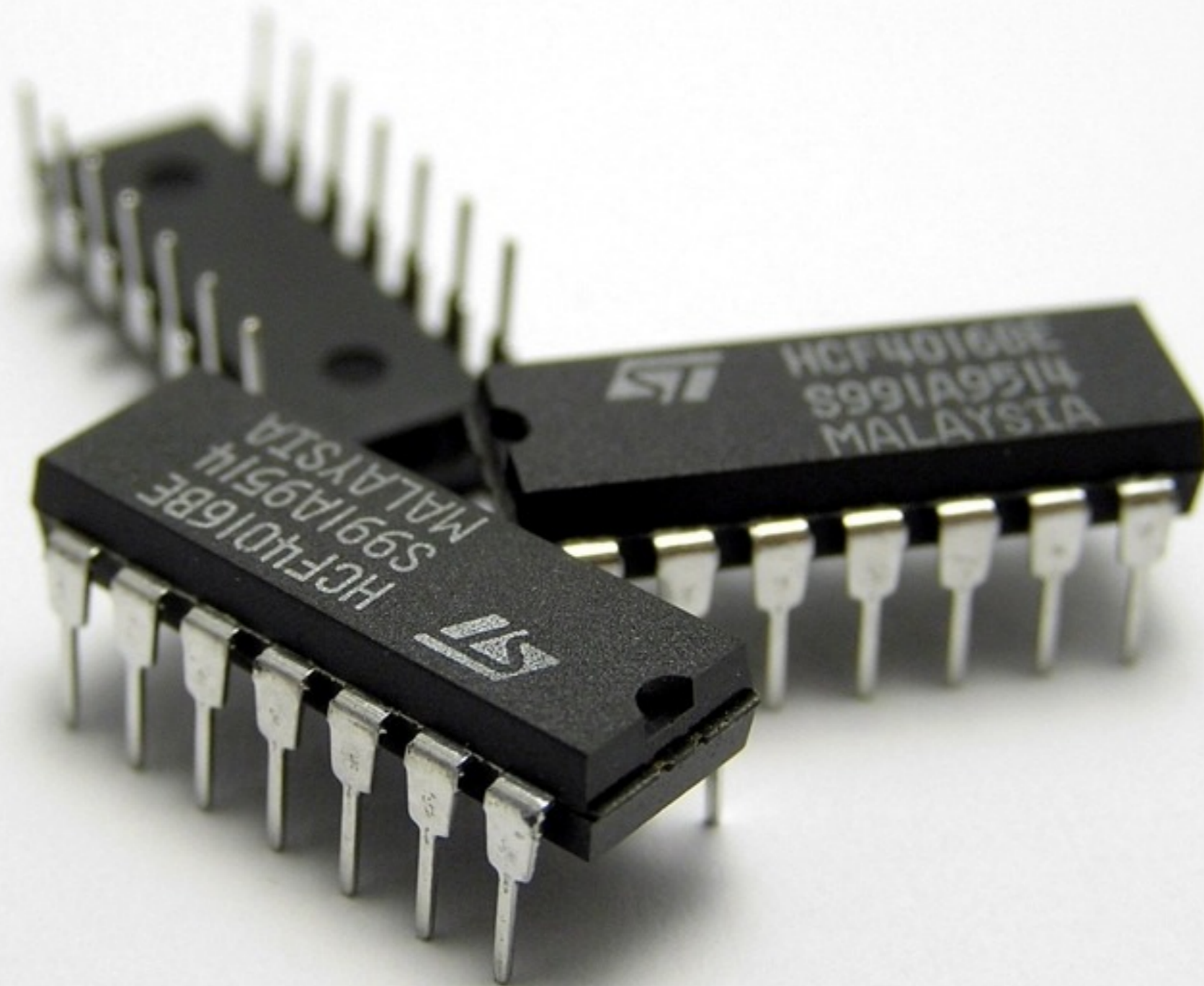


## EDSAC computer (1949)

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

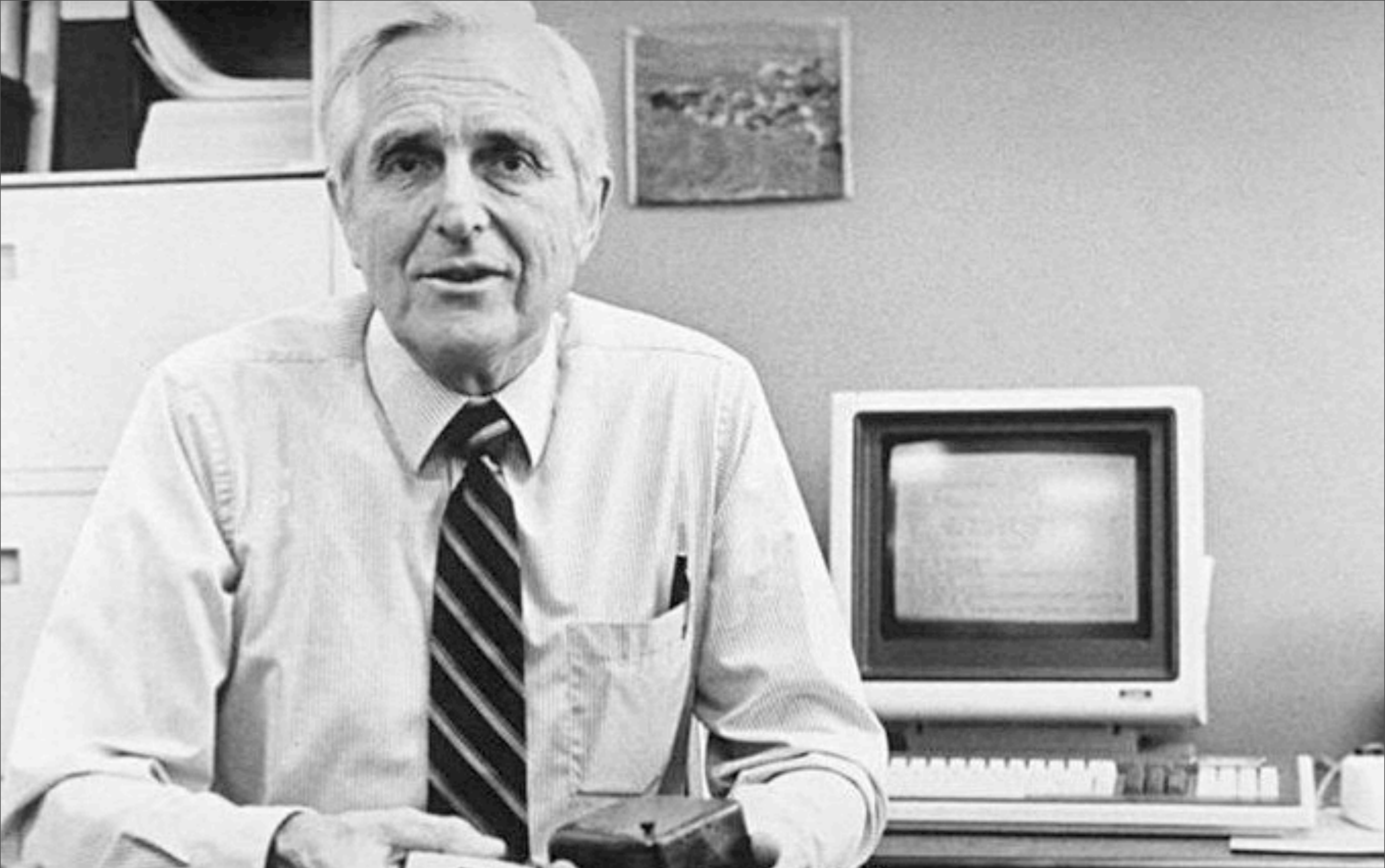
"I think there is a world market for maybe five computers."

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



## Mid sized ICs

[http://upload.wikimedia.org/wikipedia/commons/8/80/Three\\_IC\\_circuit\\_chips.JPG](http://upload.wikimedia.org/wikipedia/commons/8/80/Three_IC_circuit_chips.JPG)



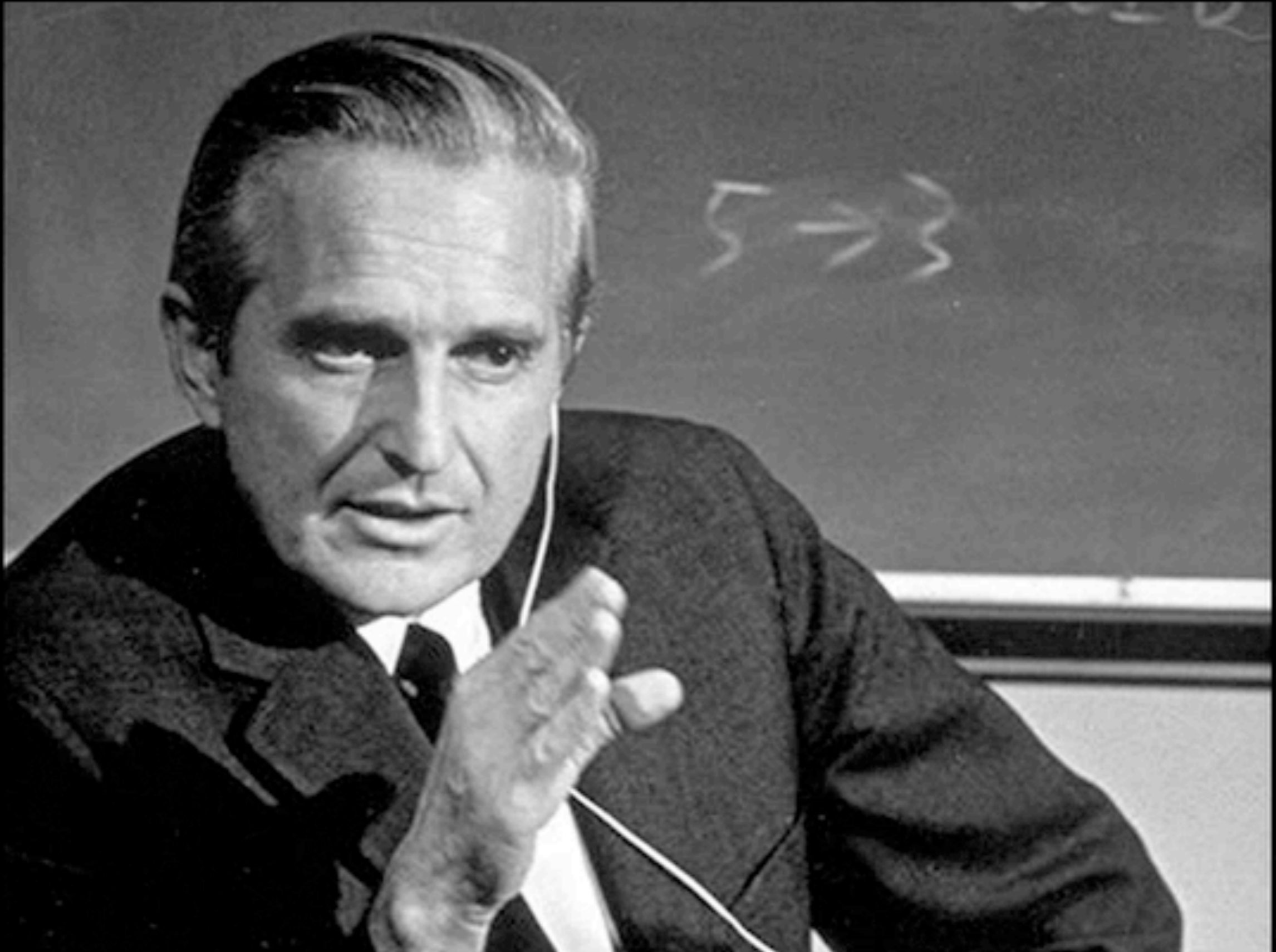
# Douglas Engelbart

<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.”

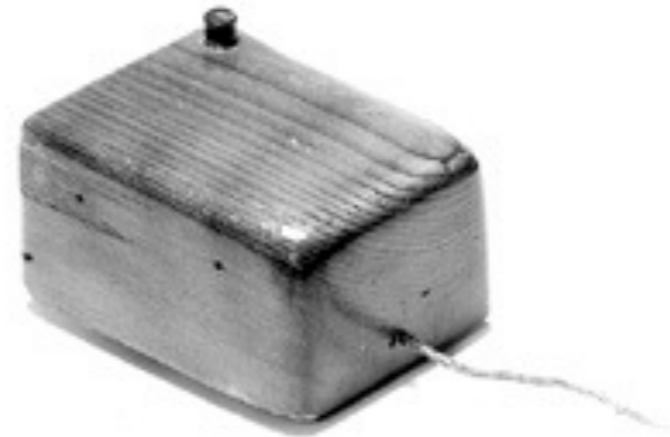
**Douglas C. Engelbart, 2003, referring to 1964**







## Looking back... (Discussion)



## Looking back... (Discussion)

-reflection of the process (concept generation)



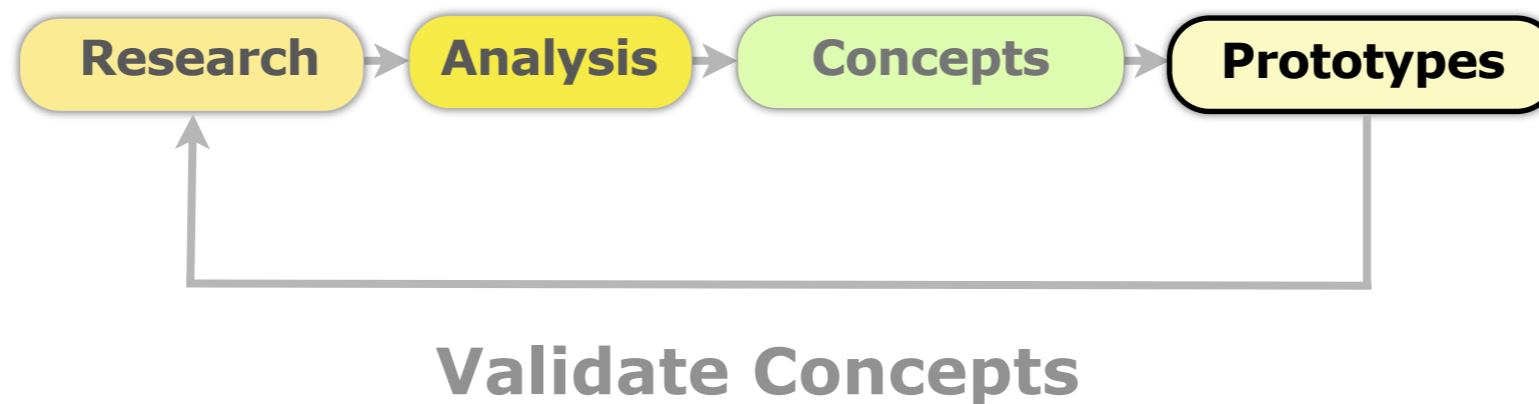
## Looking back... (Discussion)

- reflection of the process (concept generation)
- construction of different prototypes (alternative design)



## Looking back... (Discussion)

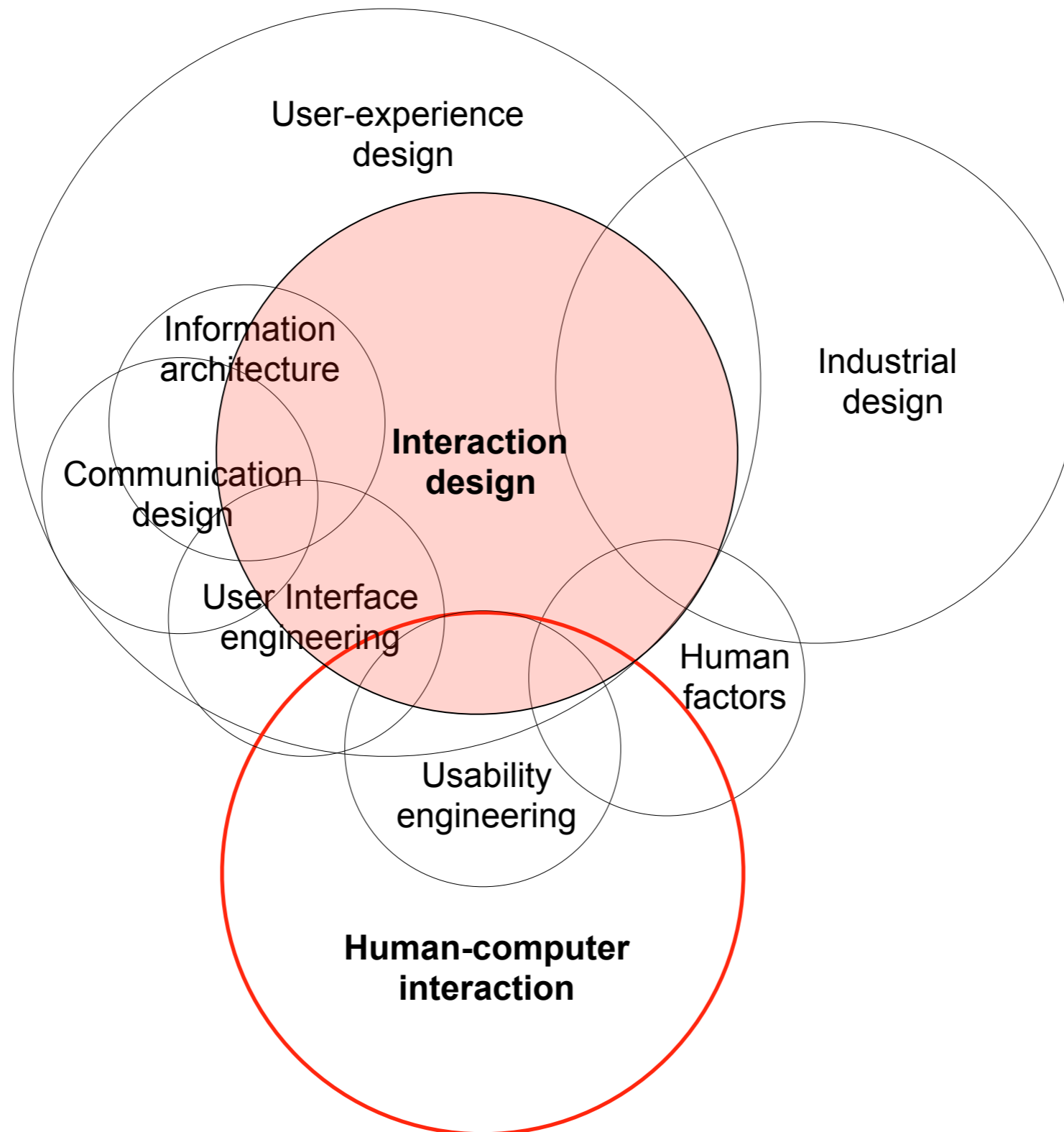
- reflection of the process (concept generation)
- construction of different prototypes (alternative design)
- iterative development of prototypes (prototyping and testing)



## Looking back... (Discussion)

- 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)





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

**1. Artifacts**—physical objects designed to provide for human comfort, the manipulation of things or materials, and the manipulation of symbols.

**2. Language**—the way in which the individual classifies the picture of his world into the concepts that his mind uses to model that world, and the symbols that he attaches to those concepts and uses in consciously manipulating the concepts (“thinking”).

**3. Methodology**—the methods, procedures, and strategies with which an individual organizes his goal-centered (problem-solving) activity.

**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 visualized as comprising a trained human being, together with his artifacts, language, and methodology.**

**1. Artifacts**—physical objects designed to provide for human comfort, the manipulation of things or materials, and the manipulation of symbols.

**2. Language**—the way in which the individual classifies the picture of his world into the concepts that his mind uses to model that world, and the symbols that he attaches to those concepts and uses in consciously manipulating the concepts (“thinking”).

**3. Methodology**—the methods, procedures, and strategies with which an individual organizes his goal-centered (problem-solving) activity.

**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.

# History

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



founded 1970 by Xerox



founded 1970 by Xerox

<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...

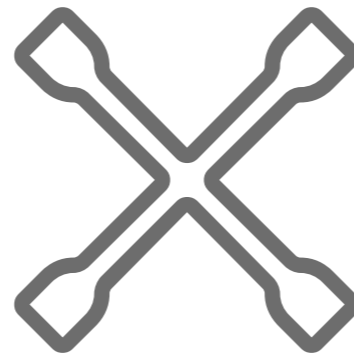
-exploration of the design space through the integration of industrial design





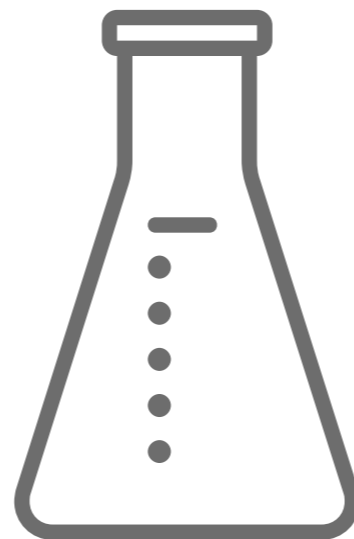
## Looking back...

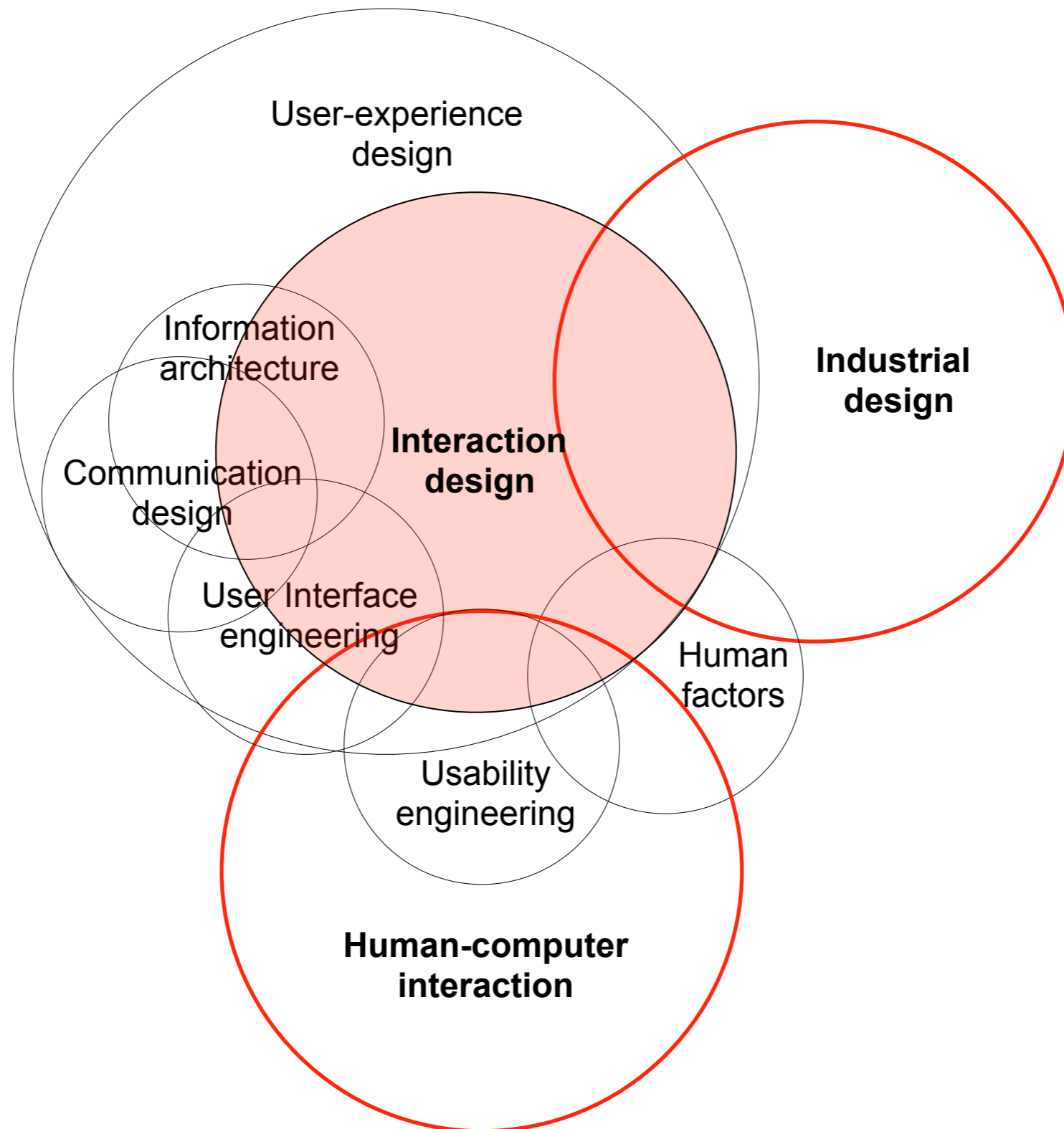
- exploration of the design space through the integration of industrial design
- designers and engineers had to work together (interdisciplinary approach)



## Looking back...

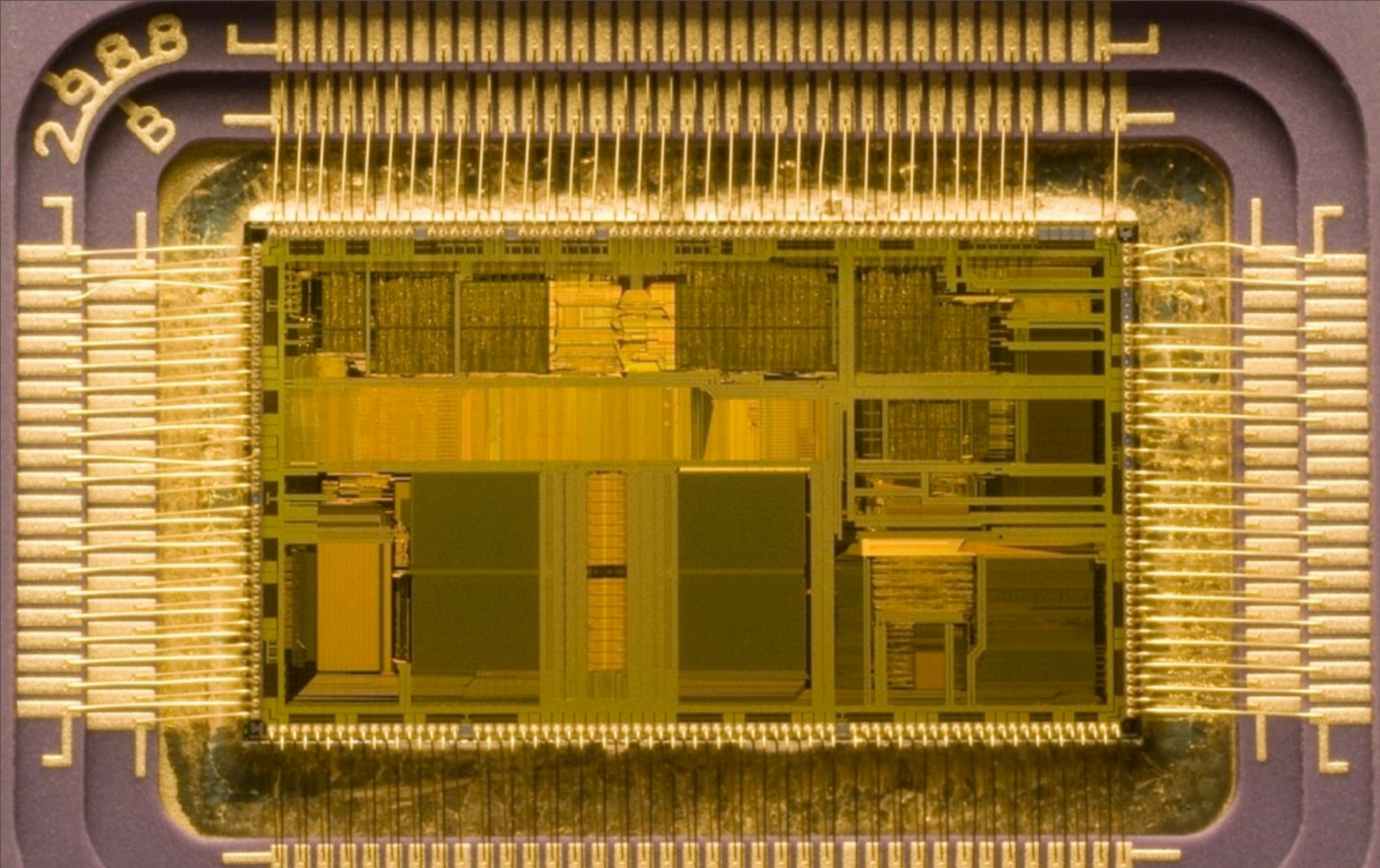
- exploration of the design space through the integration of industrial design
- designers and engineers had to work together (interdisciplinary approach)
- science served to constrain the design space





# History

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



## 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 centered 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.

The driver of the southbound vehicle

Transpose (letters, words)

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

majoring 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

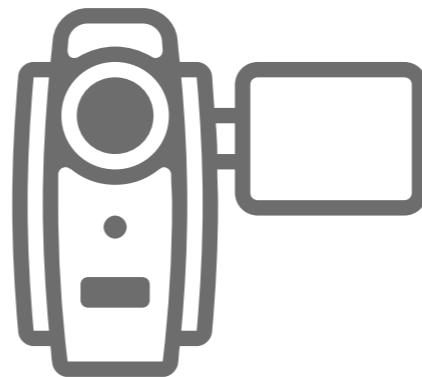
the very exciting climax of the film

Insert word

the exciting climax of the film

## Looking back...

-spending time to understand users (design research)





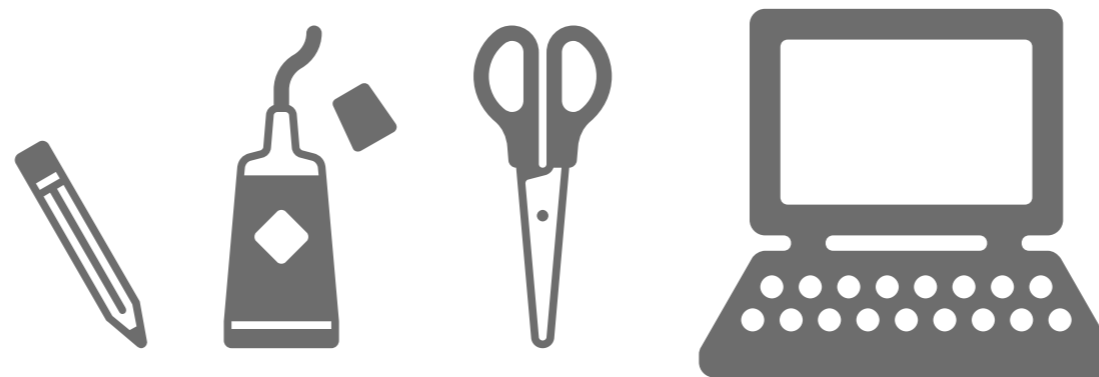
## Looking back...

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



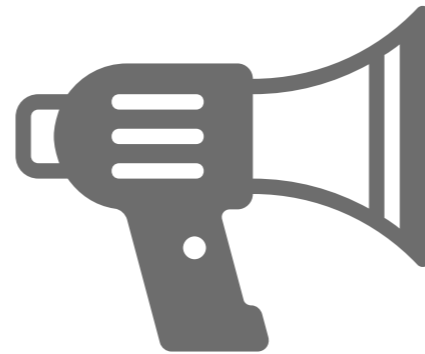
## Looking back...

- spending time to understand users (design research)
- designing by involving the users of the system (participatory design techniques)
- prototyping parts of the system with non functional elements (wizard-of-oz prototyping)



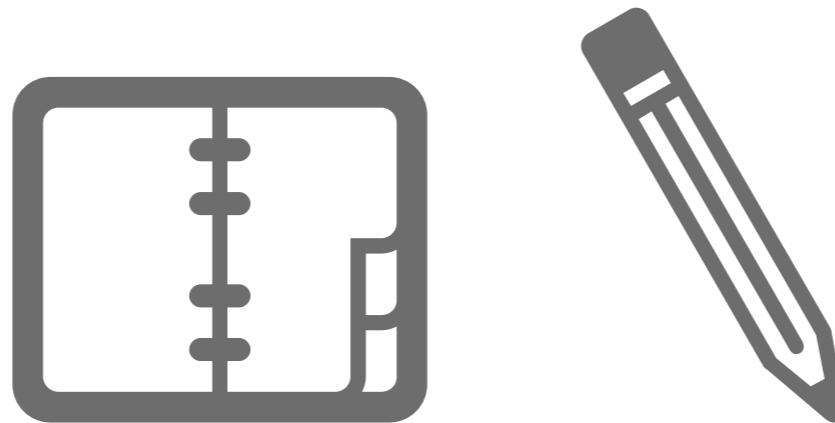
## Looking back...

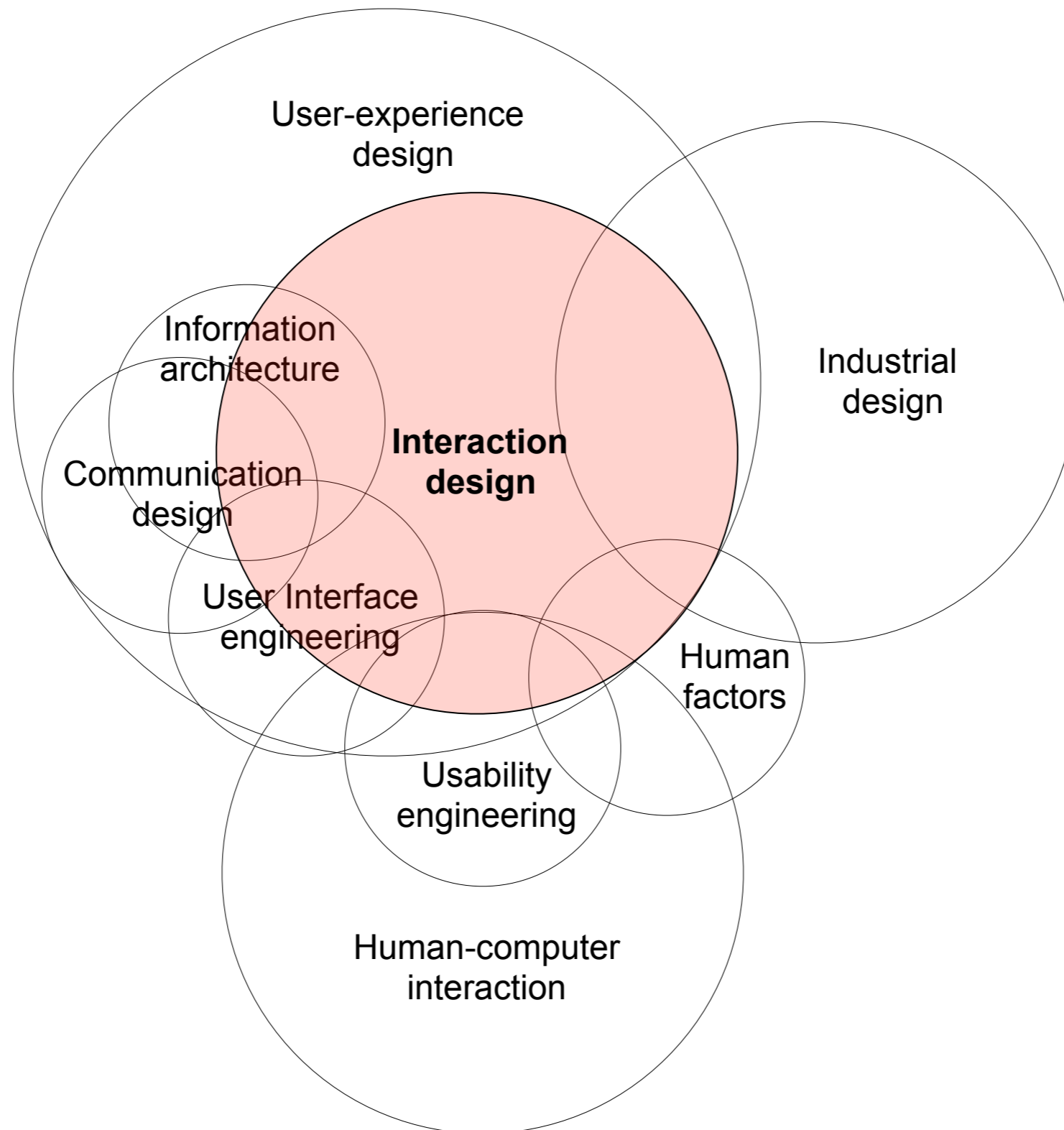
- spending time to understand users (design research)
- designing by involving the users of the system (participatory design techniques)
- prototyping parts of the system with non functional elements (wizard-of-oz prototyping)
- asking users to “walk” them through the system (think aloud method)

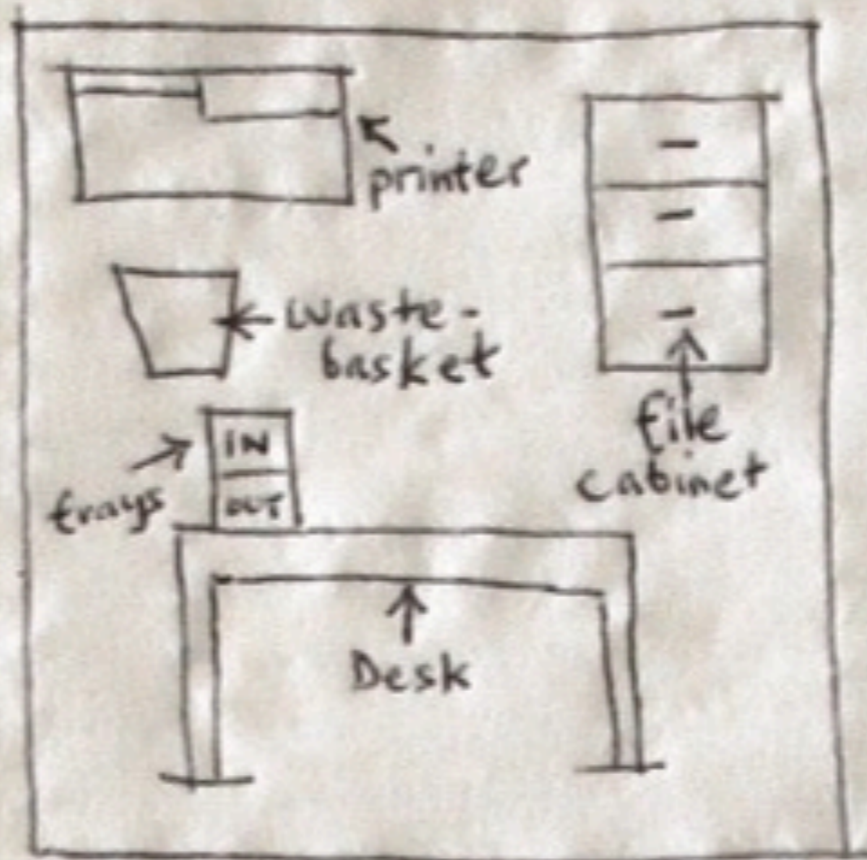


## Looking back...

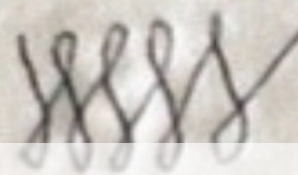
- spending time to understand users (design research)
- designing by involving the users of the system (participatory design techniques)
- prototyping parts of the system with non functional elements (wizard-of-oz prototyping)
- asking users to “walk” them through the system (think aloud method)
- designing the system using mental models user could refer to (metaphors+scenarios)







Office Schematic



PRINT FILE DELETE MAIL

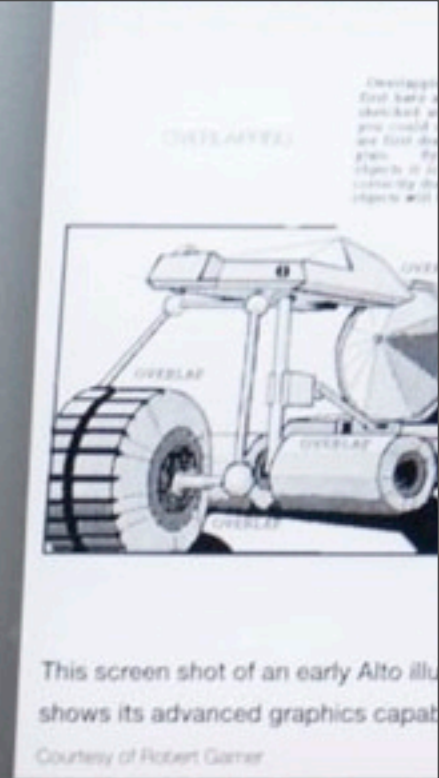


all are inter-doc

# Office Schematic / Desktop Metaphor

# Xerox Alto 1973

[http://dl.maximumpc.com/galleries/25oldpcs/xerox\\_alto\\_front\\_full.jpg](http://dl.maximumpc.com/galleries/25oldpcs/xerox_alto_front_full.jpg)



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 menus became the model for the Microsoft® Windows and Apple® Macintosh® interfaces of today.  
From the collection of The Computer Museum History Center

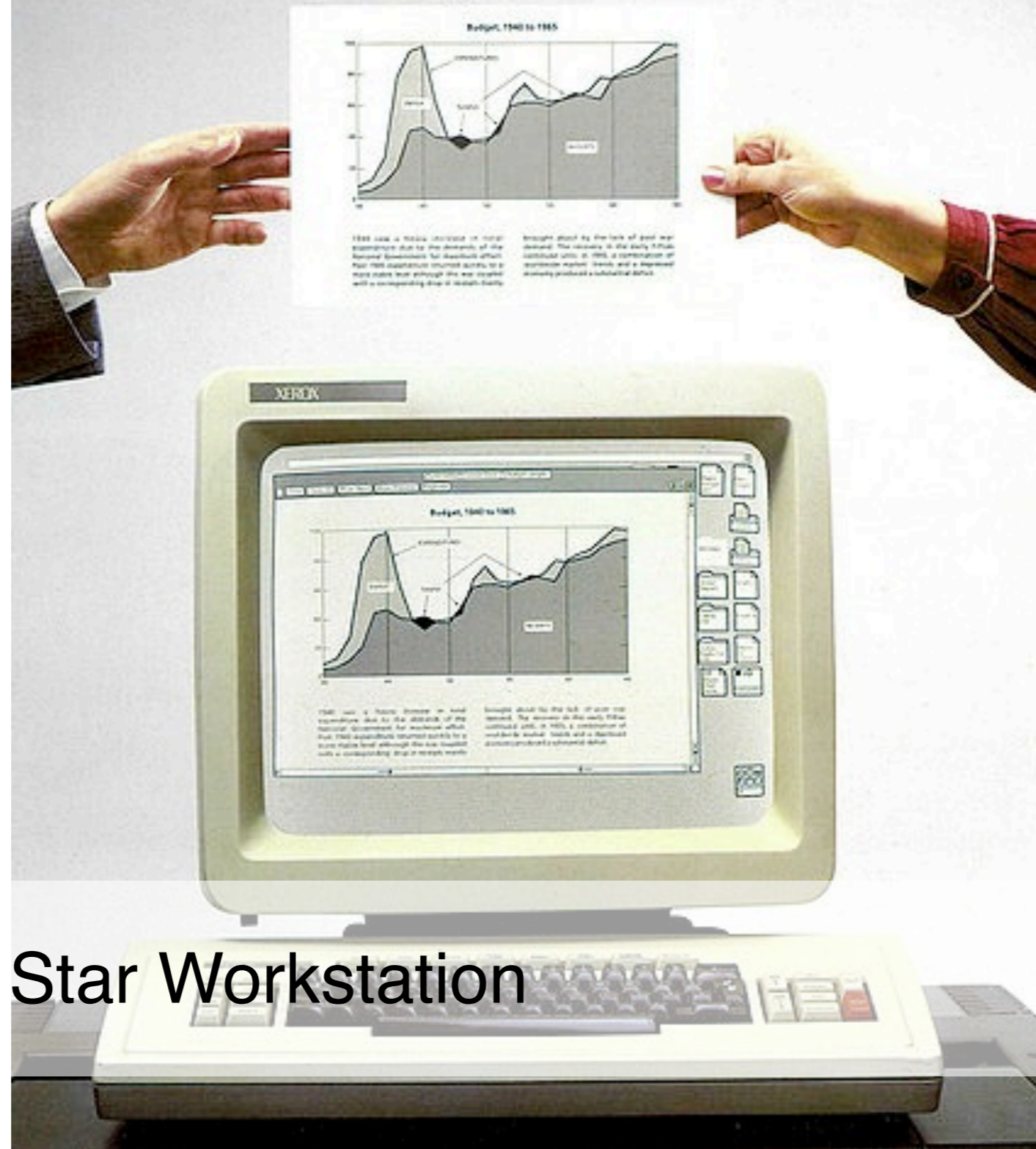
"There is no reason anyone would want a computer in their home."

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





Now you can create  
documents with words  
*and* pictures



1981 Xerox Star Workstation



YEAR	Non-MS-DOS	MS-DOS
1978	95.2	15.8
1980	41.1	38.3
1983	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

NAME	EXTENSION	SIZE	DATE
COMMAND	COM	22677	15-8
AND	SYS	2498	18-8
ASSIGN	COM	964	20-8
ATTRIB	EXE	15091	14-8
BACKUP	COM	17024	20-4
CHKDSK	COM	2435	24-8
CHMOD	COM	6528	27-4
COMP	COM	3018	10-8
DEBUG	EXE	15364	15-8

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

### Text and Graphics

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

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

## 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 selecting them with the mouse and touching the MOVE, COPY, DELETE or PROPERTIES command keys. Text and graphics are edited with the **same** keys.



### Shorter Production Times

Experiences 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:

# History

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

## 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



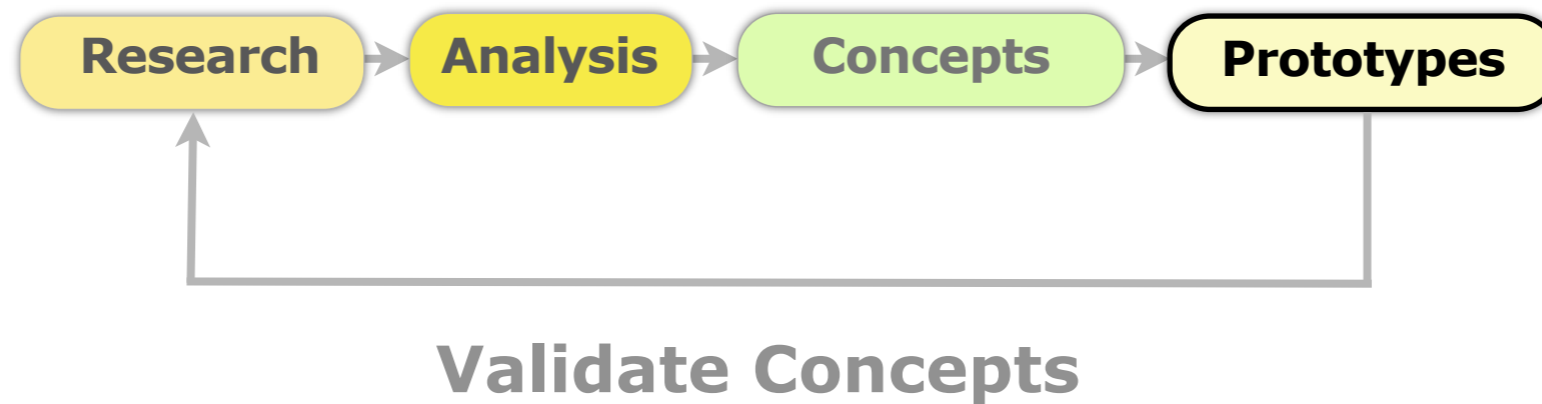
## Text Selection

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

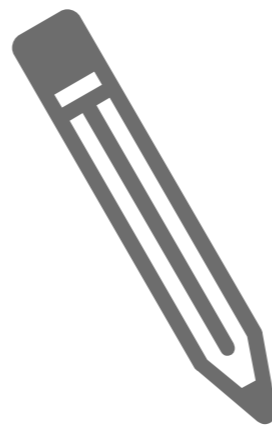
## Looking back...

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



## Looking back...

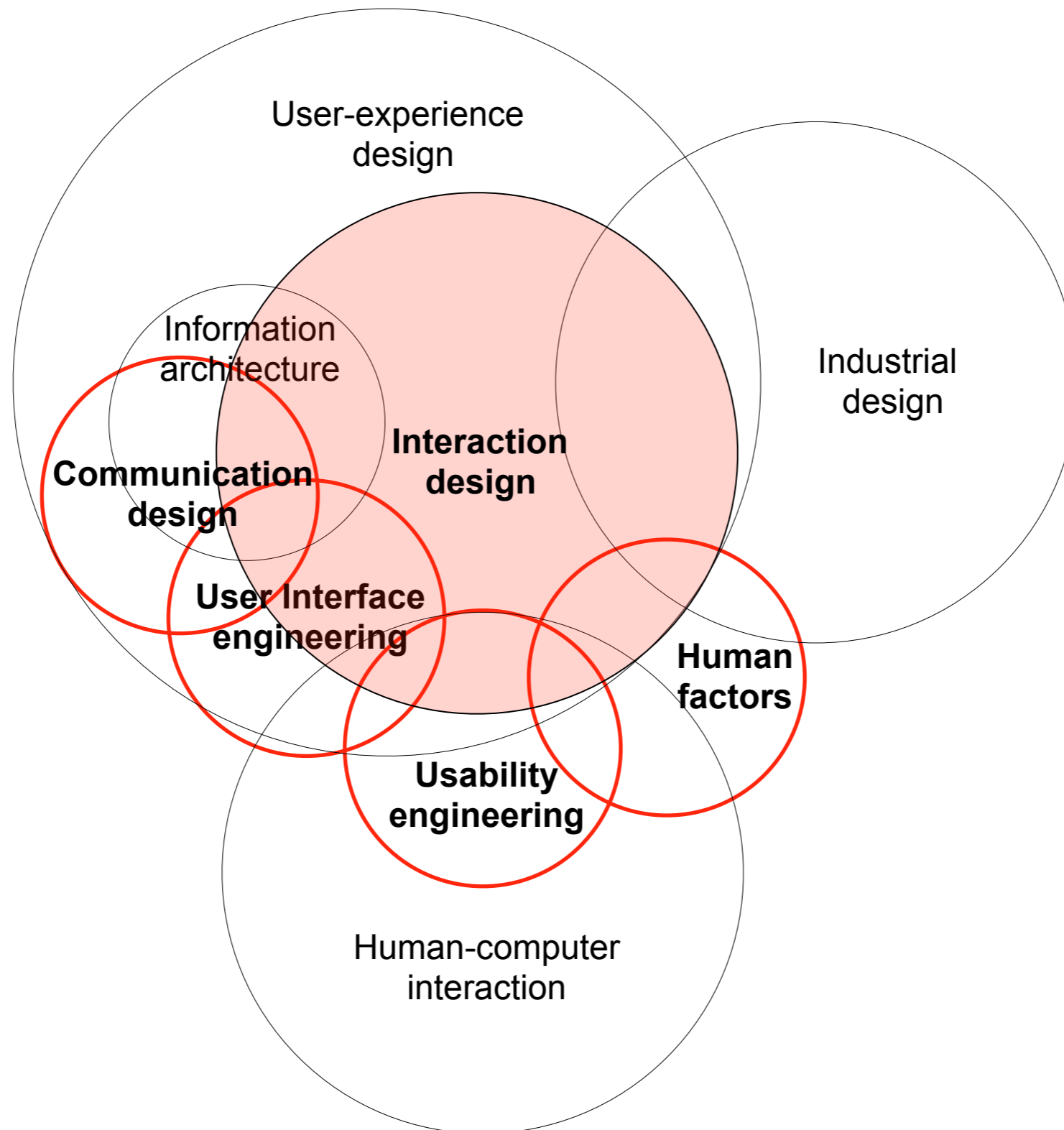
- brainstorming and iterative trying and testing (iterative design process)
- constant, quick and efficient tests with users to improve the system (experience prototyping)





## Looking back...

- 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 centered 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)
- proposal of a participatory design approach, creating better UIs



# Apple Lisa 1983

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

### Mac System Software

3 items 227K in disk 173K available

System Folder

Empty Folder

Mac System Softwa

SysVersion

### System Folder

5 items 211K in folder 173K available

Finder

System

Imagewriter

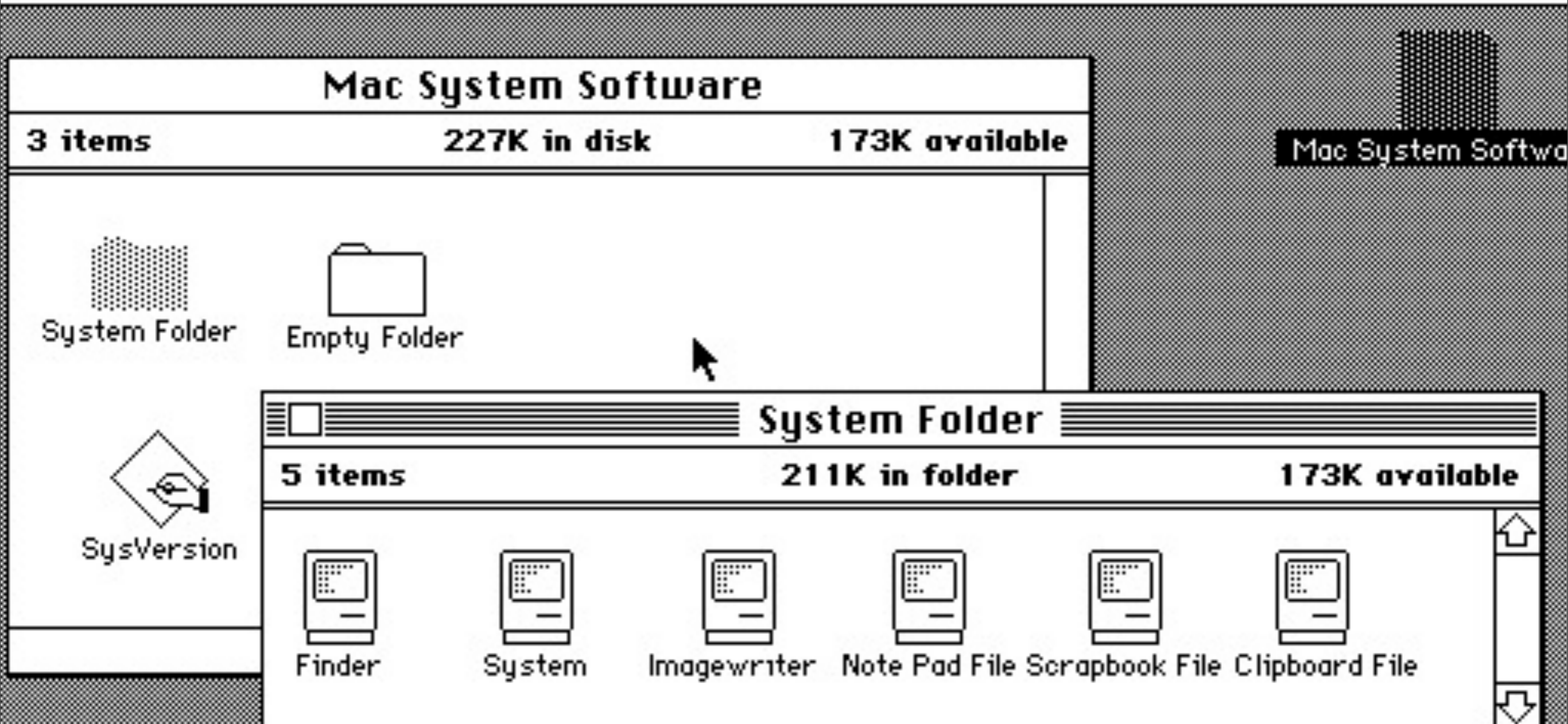
Note Pad File

Scrapbook File

Clipboard File

# Macintosh System 1.0. January 1984

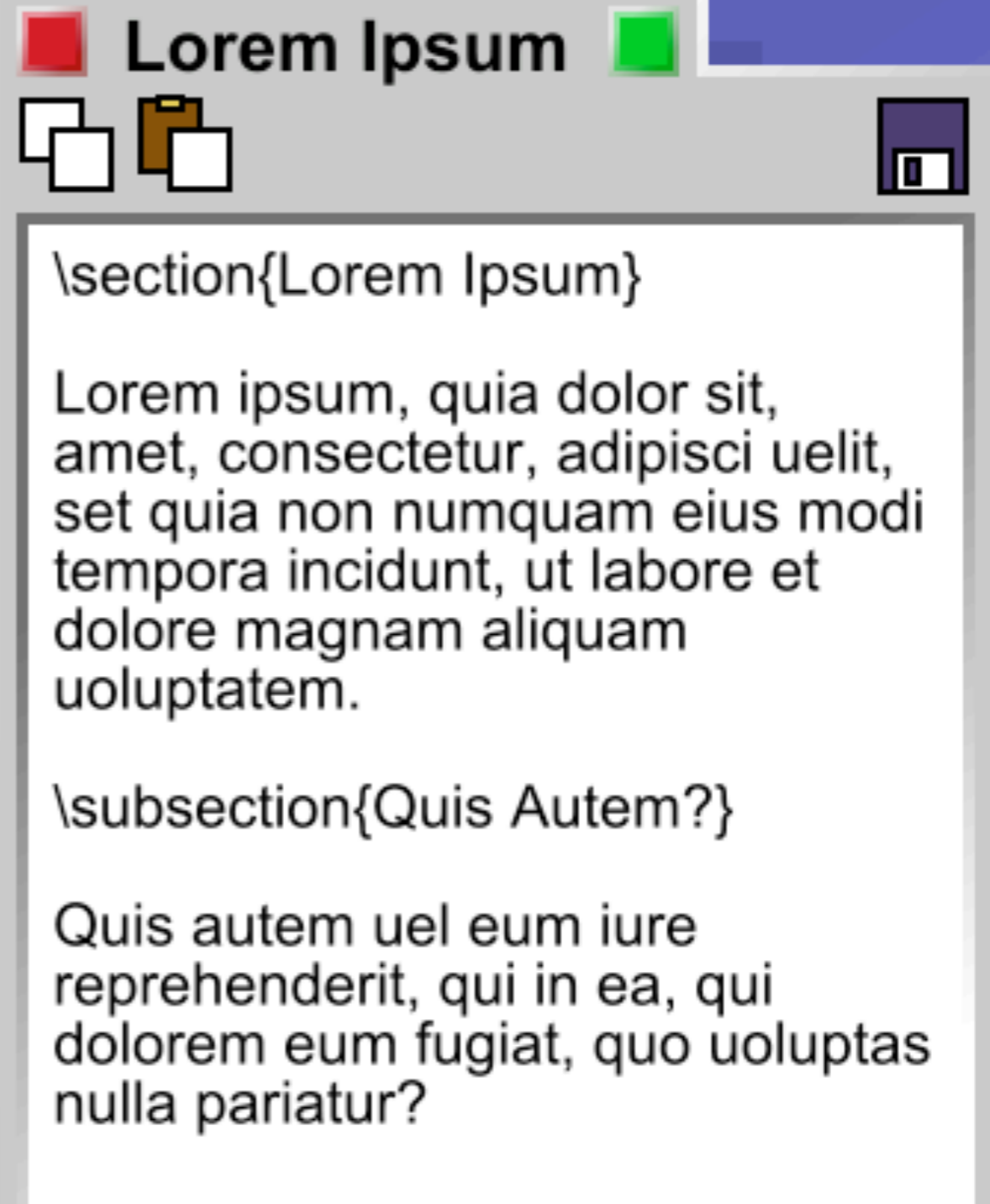
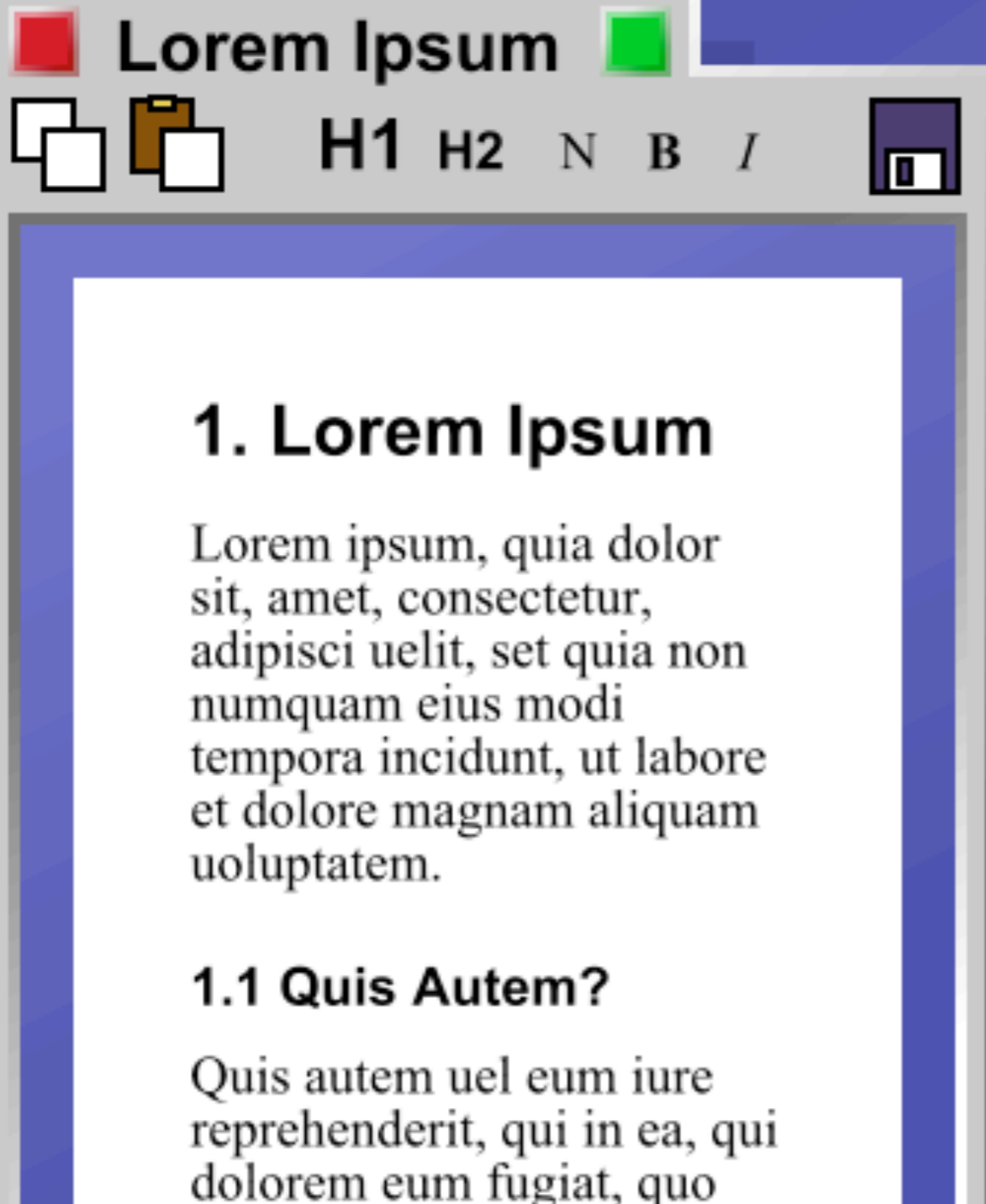




## WIMP

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





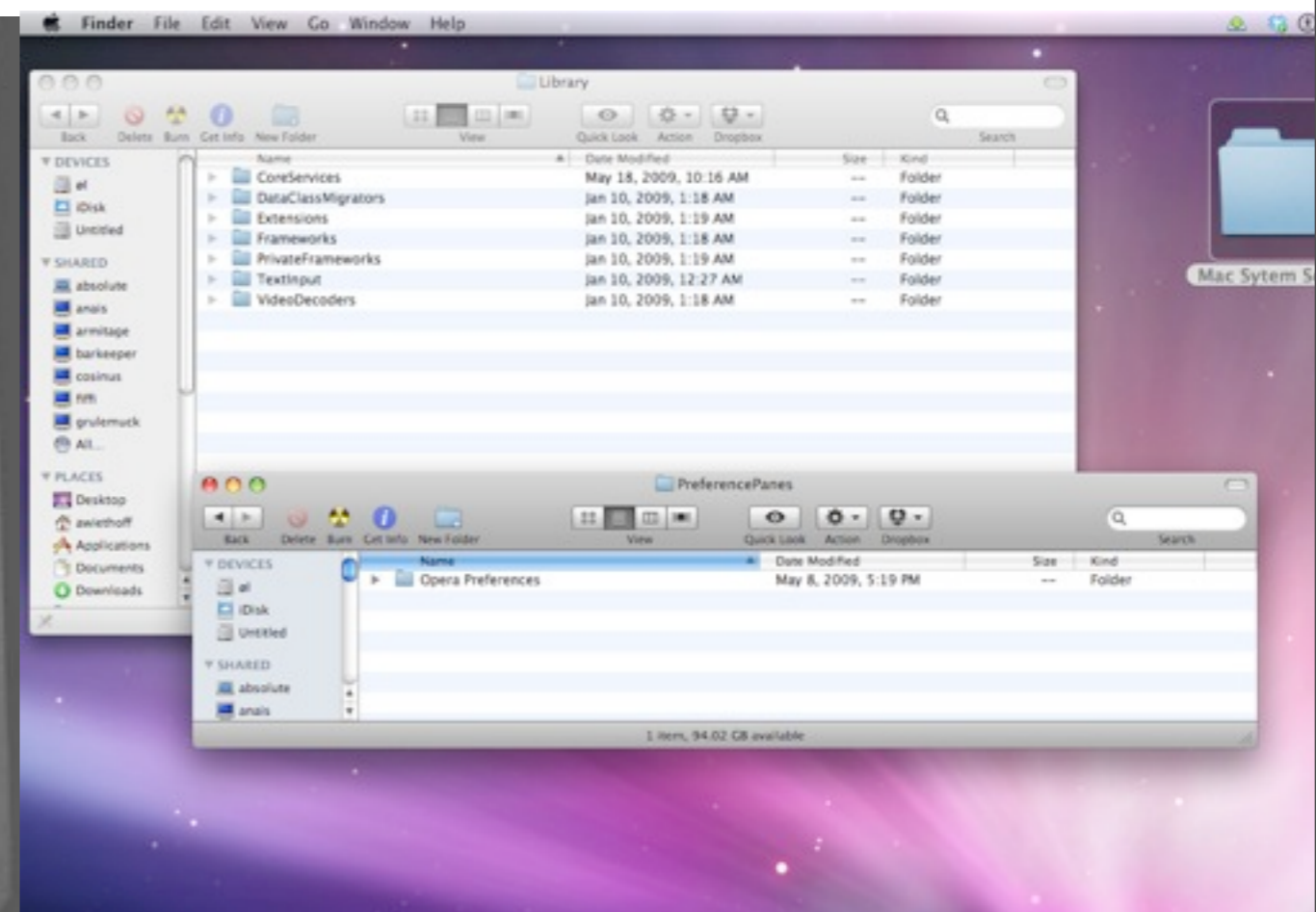
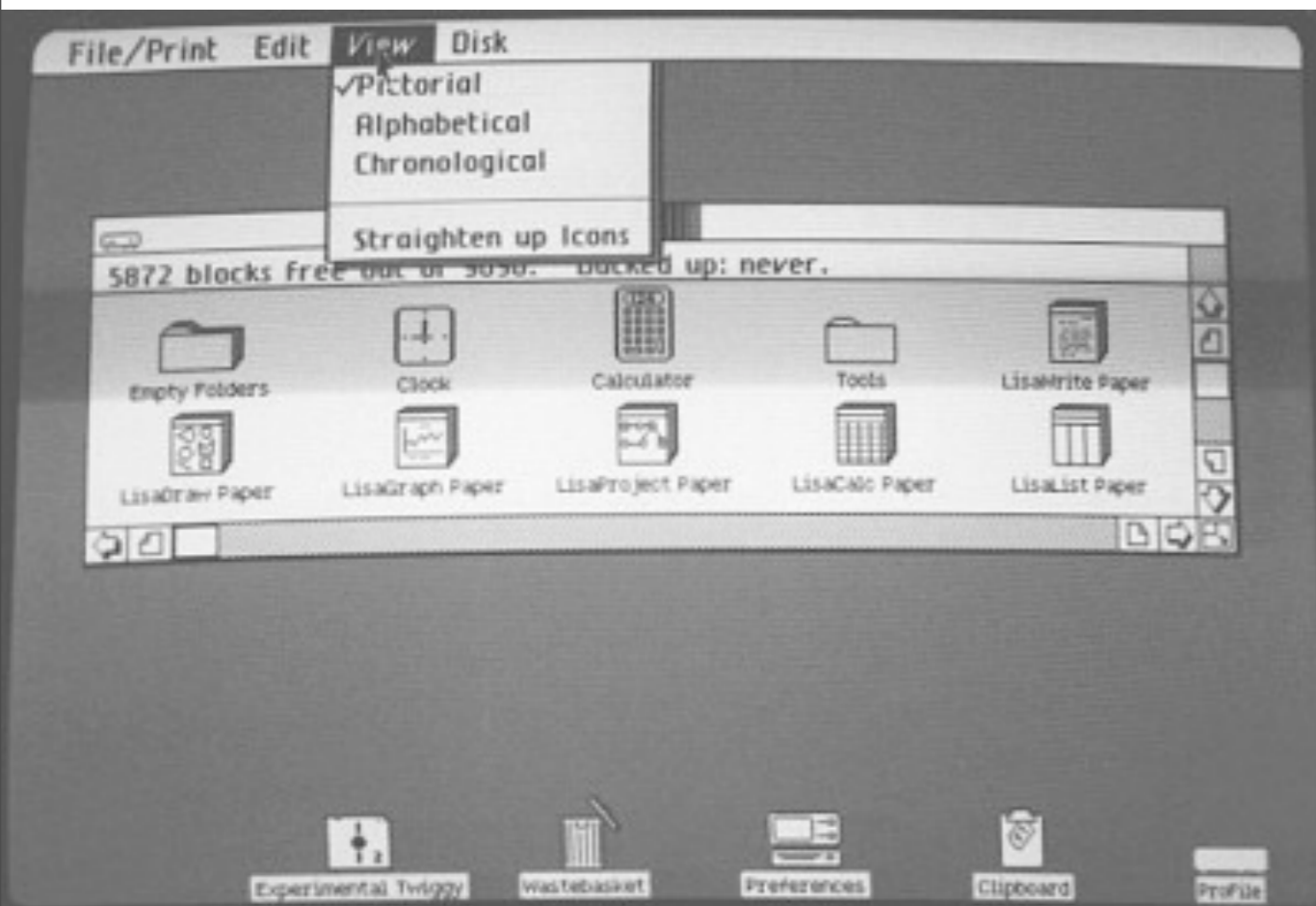
## WYSIWYG

- 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.

Name	Date Modified	Size	Kind
CoreServices	May 18, 2009, 10:16 AM	--	Folder
DataClassMigrators	Jan 10, 2009, 1:18 AM	--	Folder
Extensions	Jan 10, 2009, 1:19 AM	--	Folder
Frameworks	Jan 10, 2009, 1:18 AM	--	Folder
PrivateFrameworks	Jan 10, 2009, 1:19 AM	--	Folder
TextInput	Jan 10, 2009, 12:27 AM	--	Folder
VideoDecoders	Jan 10, 2009, 1:18 AM	--	Folder

Name	Date Modified	Size	Kind
Opera Preferences	May 8, 2009, 5:19 PM	--	Folder

# 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.*
- [2] Moggridge, B. Designing Interactions, *MIT Press, 2006.*
- [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)

