

Human Computer Interaction: A tour of three paradigms

Week 6, Part 1

Humans + Computers

- The history of human computer interaction
- The characteristics of each stage of development
- Where we might go in the future

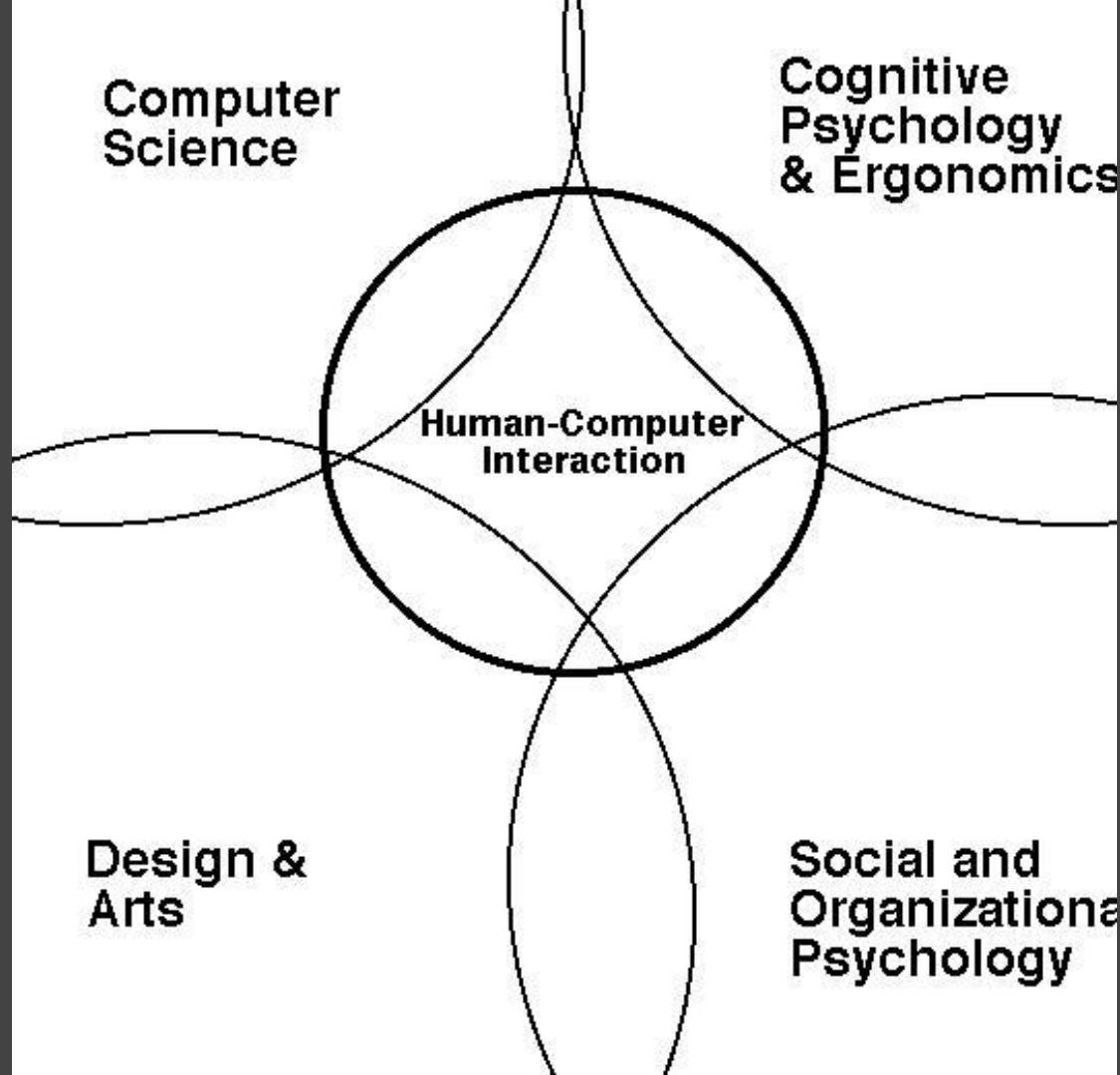
A

All Watched Over by Machines of Lo...

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MQ





Disclaimer:

There are many, many ways to understand how and why HCI has developed the way it has.

This is only one of them.

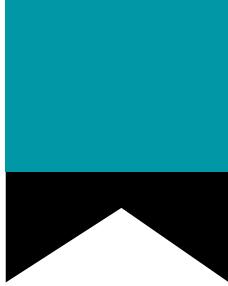
HCI as three “paradigms”

(Harrison, Tatar, Sengers 2007)

First wave (1940ish to sometime in the 90s)

Second wave (1970ish to sometime around now)

Third wave (1990s to who knows when)

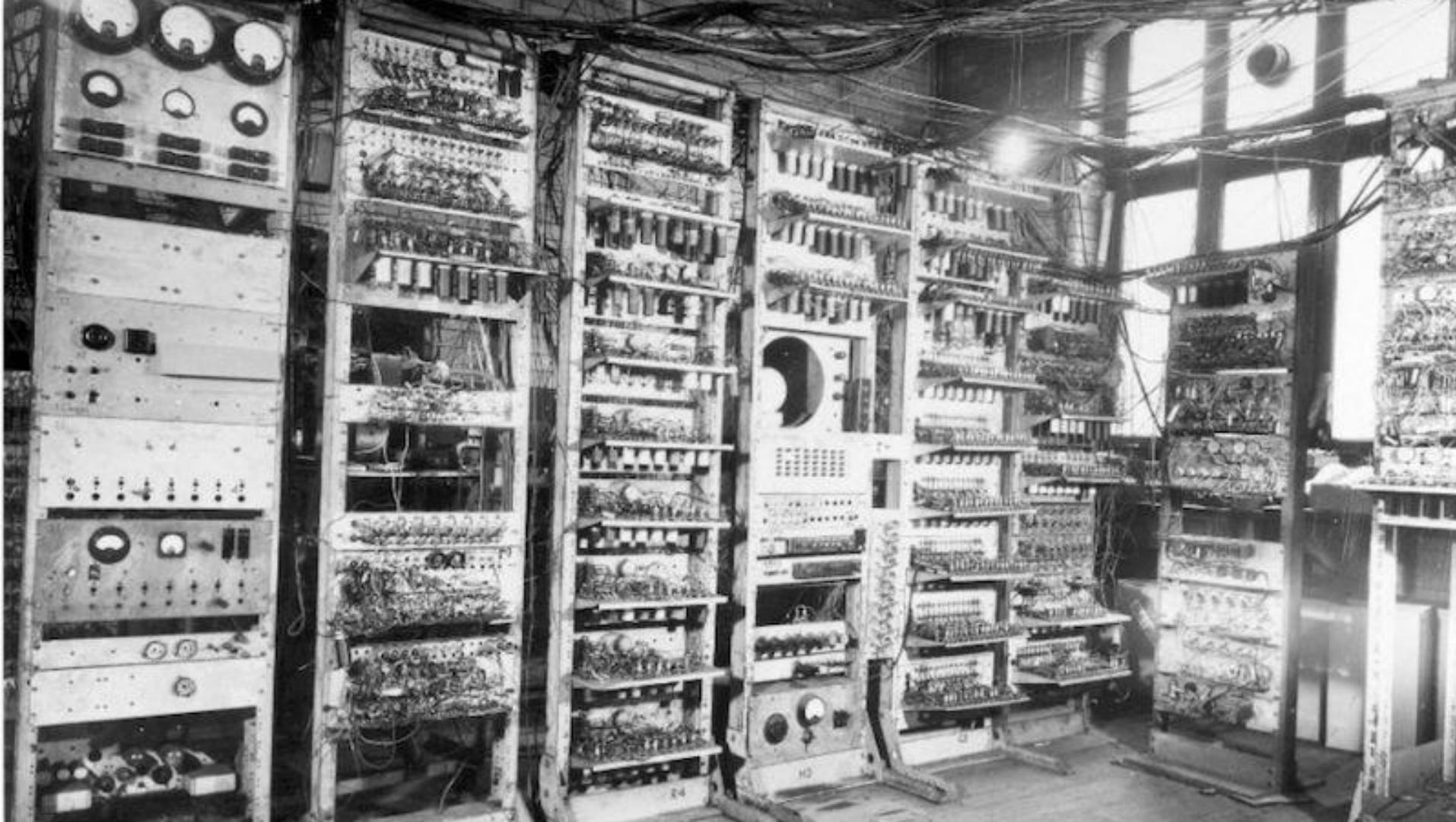


par • a • digm

(păr'ə-dīm)

A set of assumptions, concepts, values and practices that constitutes a way of viewing reality for the community that shares them, especially in an intellectual discipline.

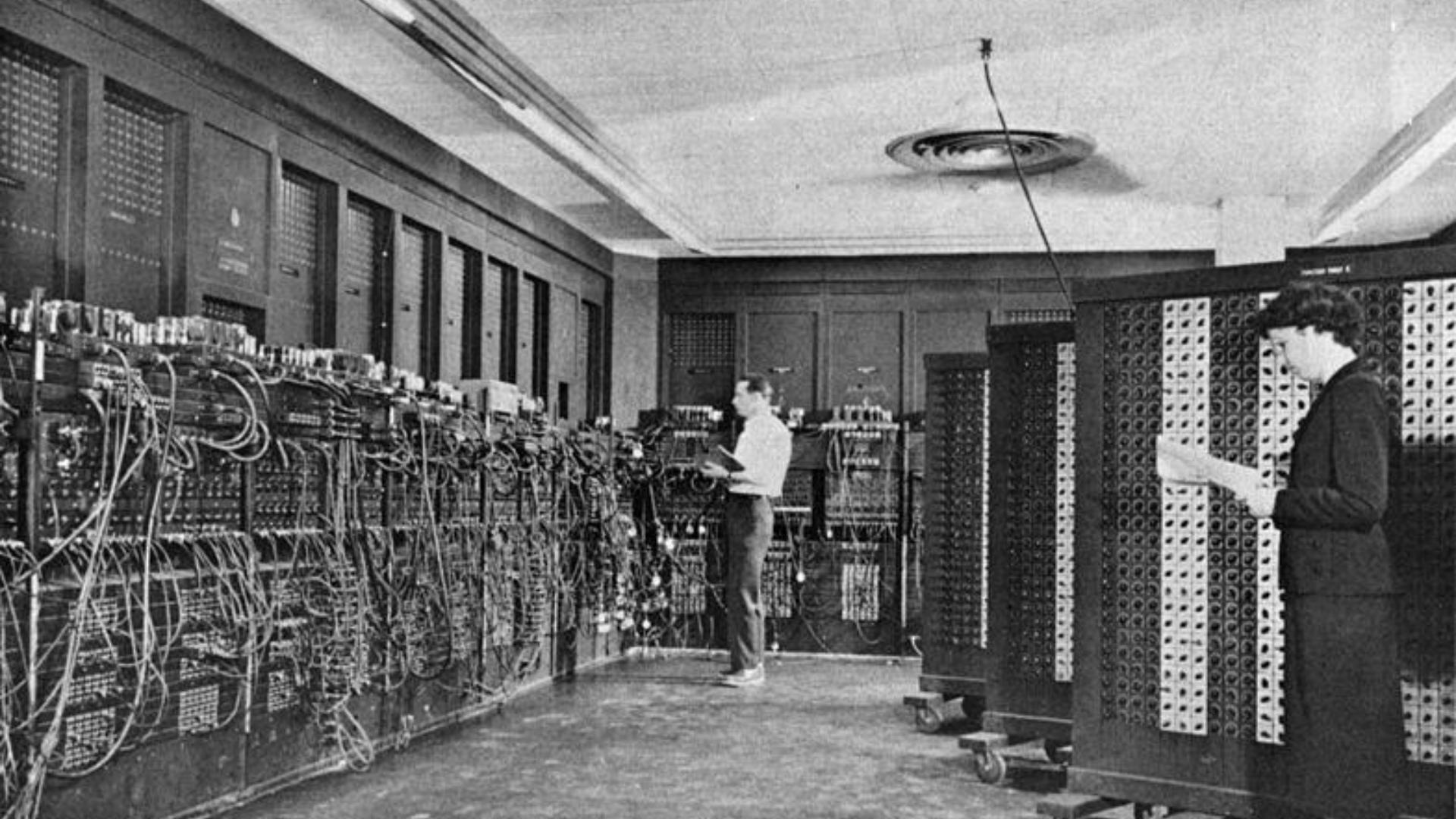
**THIS APPLIANCE
SHALL ONLY BE OPERATED
BY A TRAINED
COMPETENT PERSON**



H
3







What do they have in common?



There's no screens.



There's no keyboards.



Early HCI challenge: How can a person tell a machine what to do?

How can we give a machine commands?

How can we know what the machine is
doing, and respond?

How does data get in?

How does data get out?

Getting data in
and getting
data out

1st Wave of HCI: Human/Machine fit

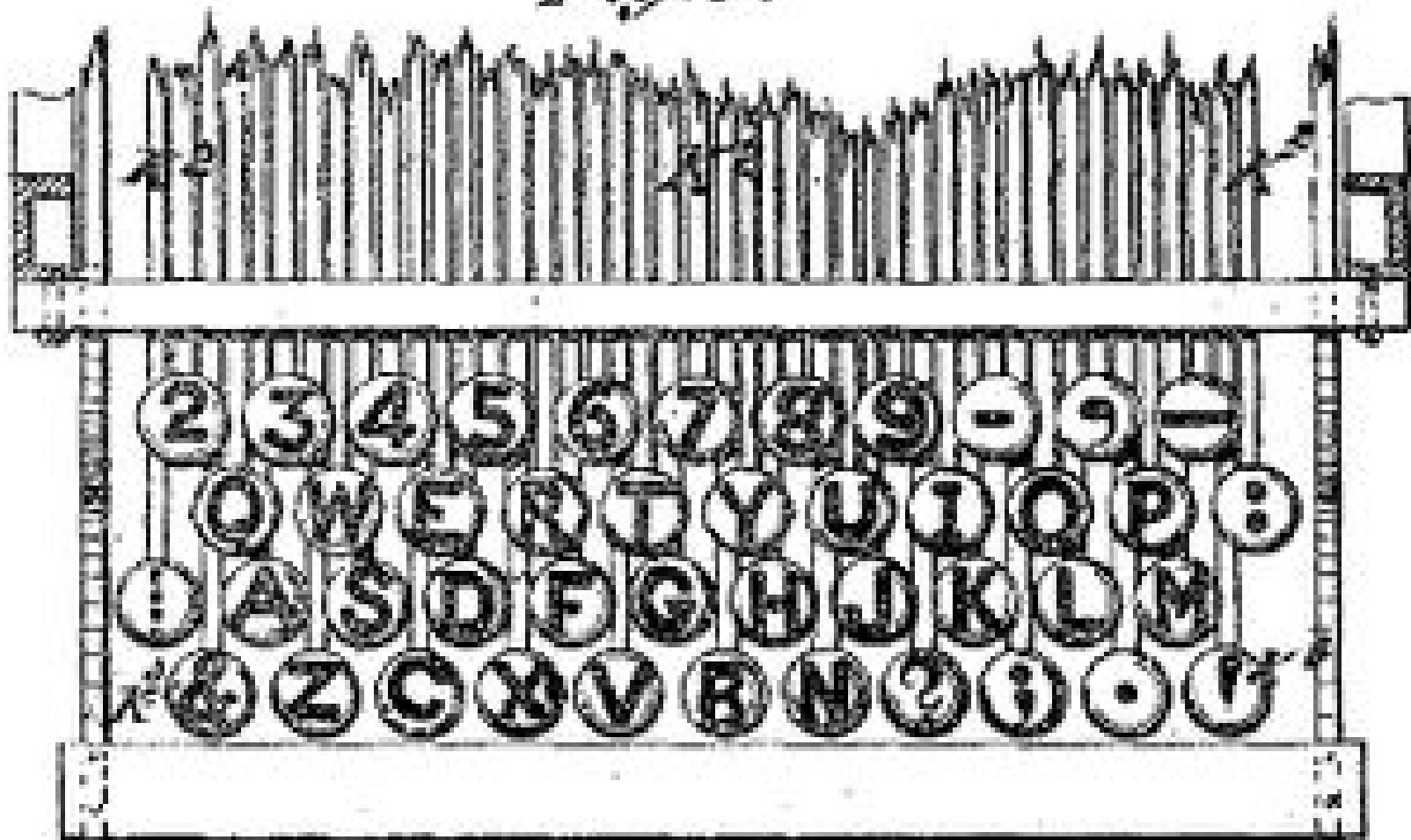
1956: Direct Input



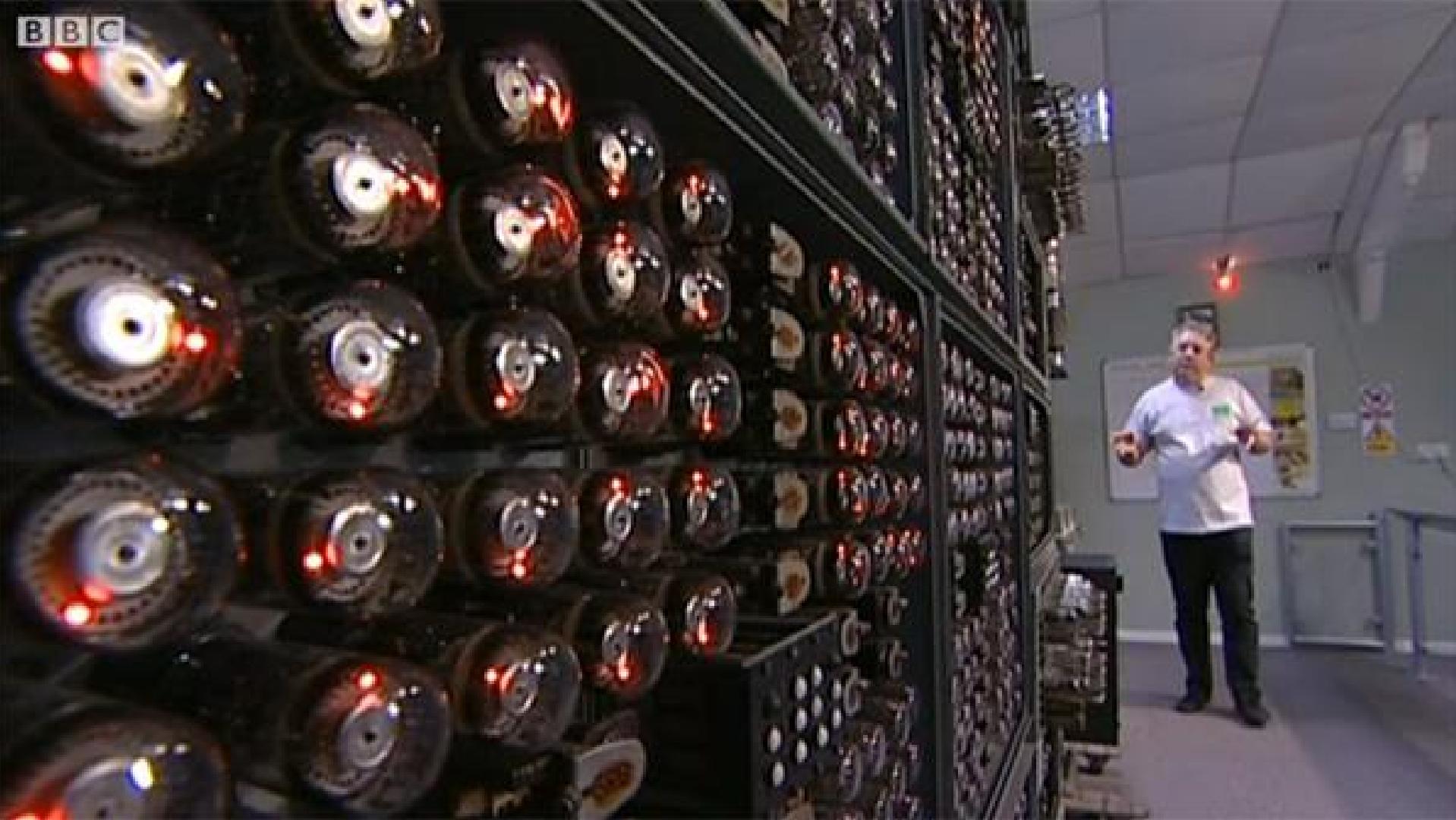




Fig. 3.



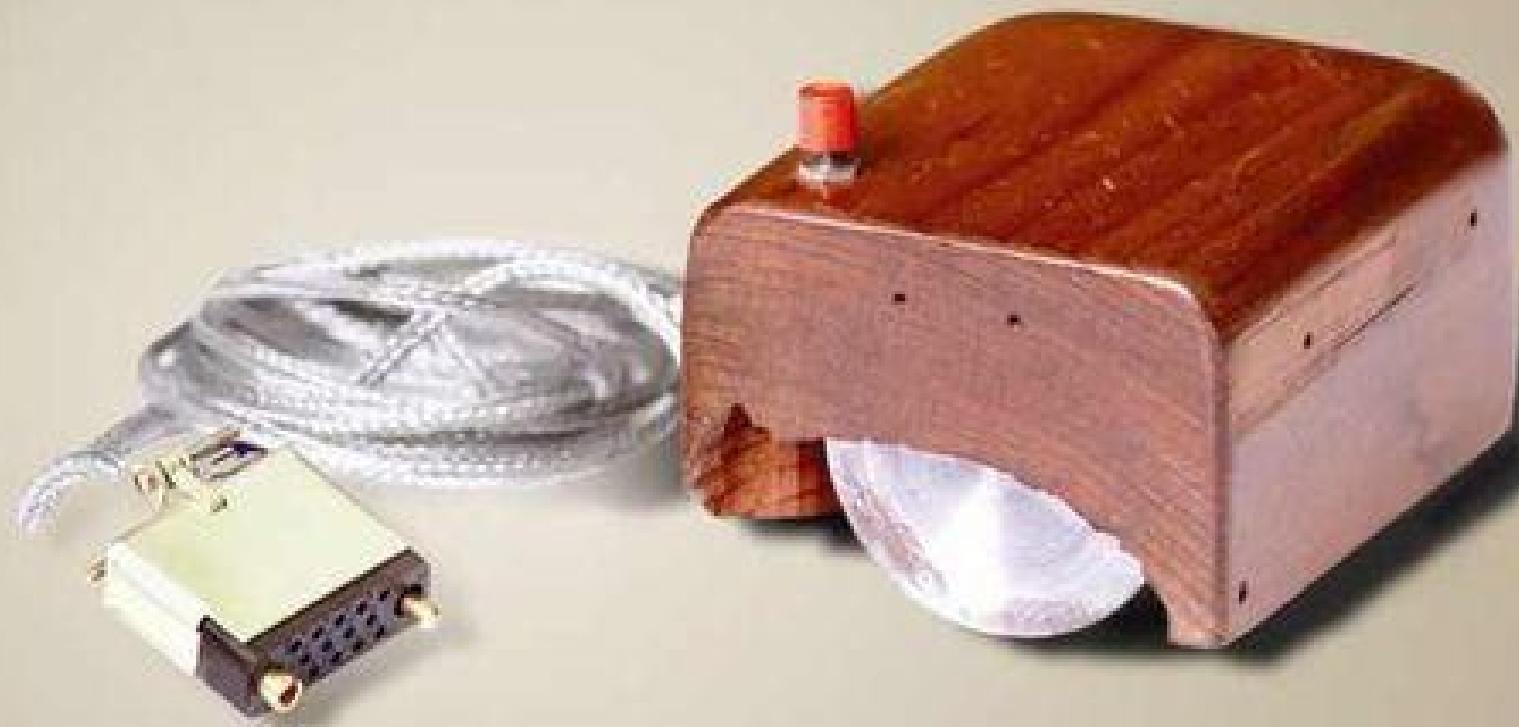
1960s: Monitors

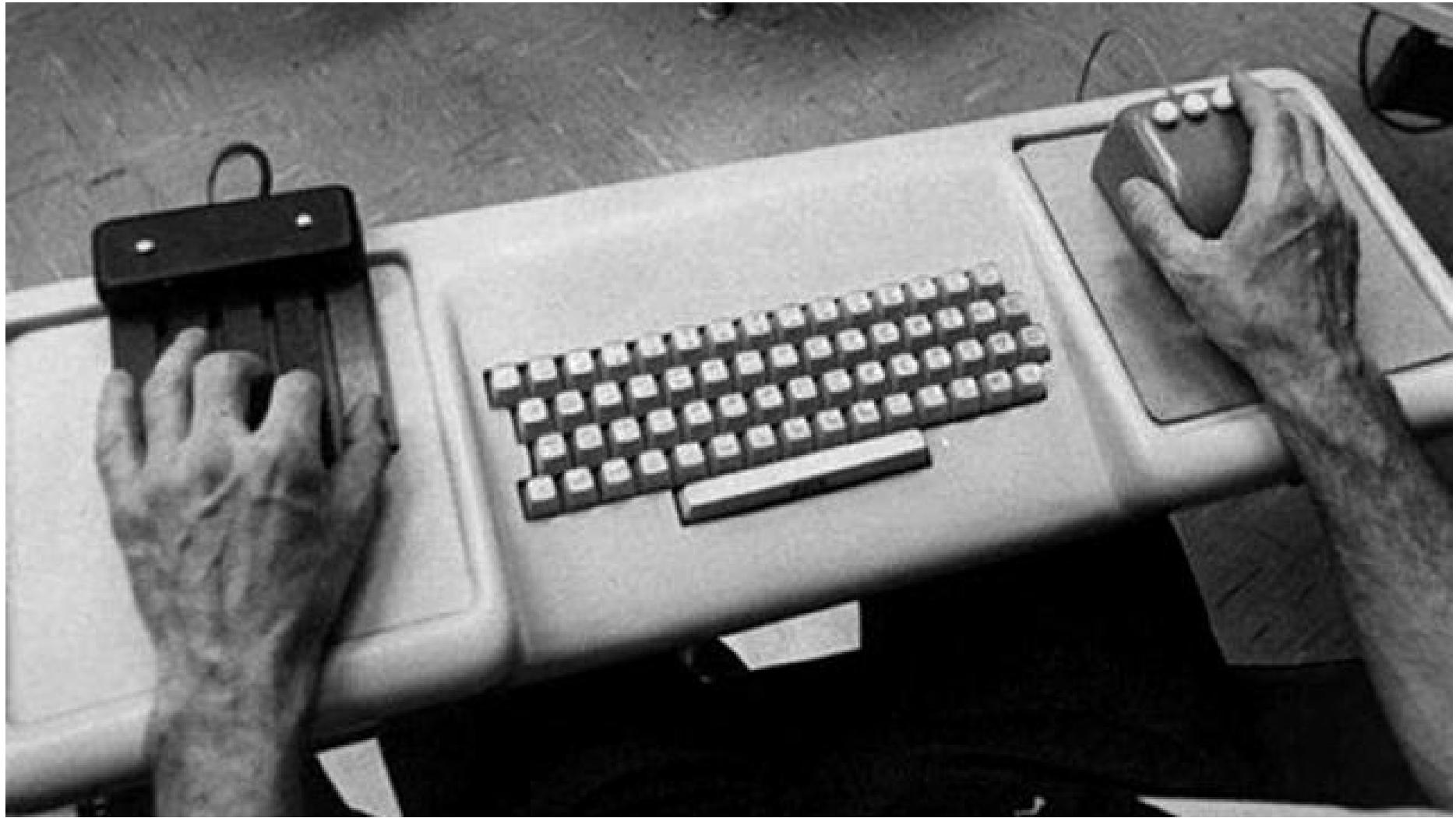






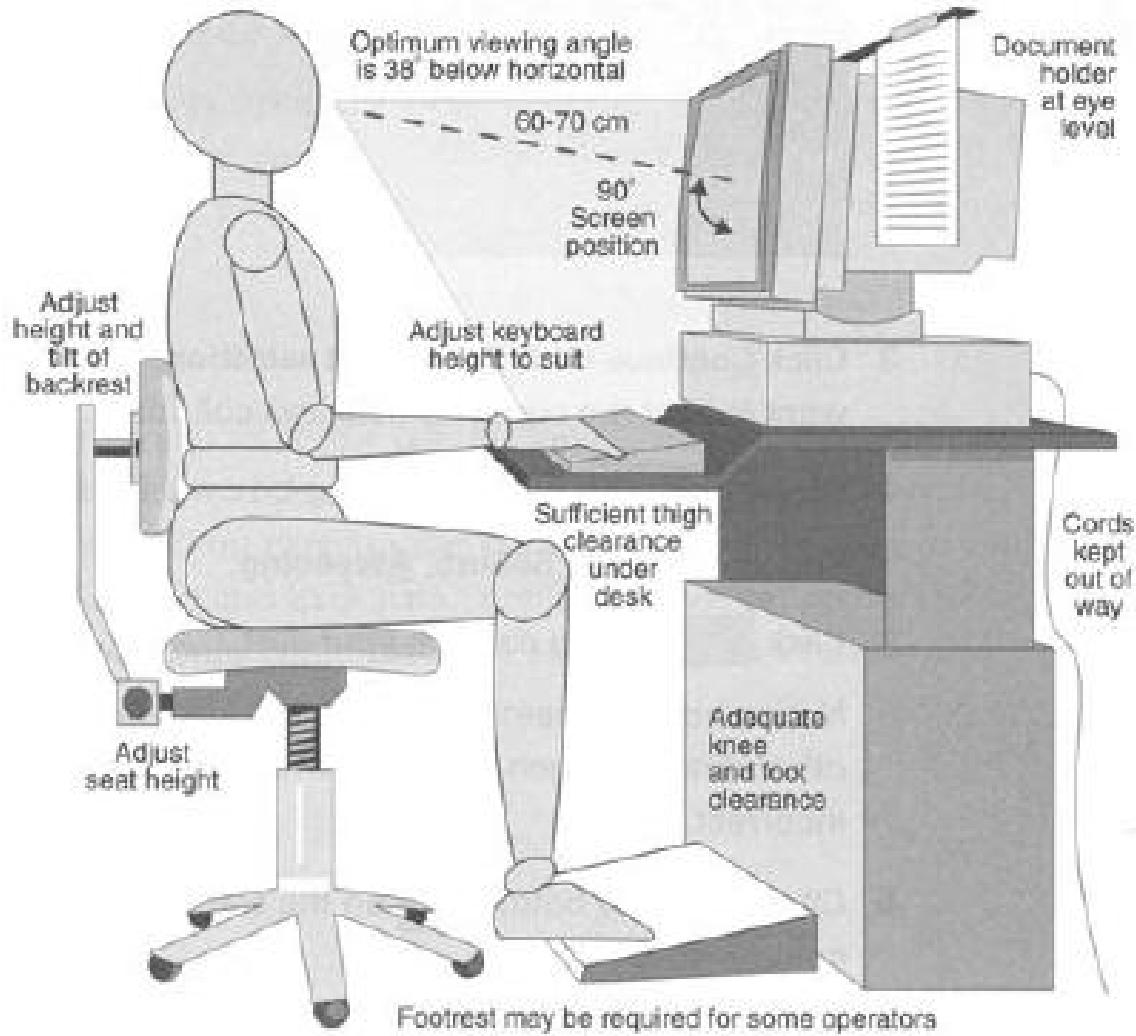








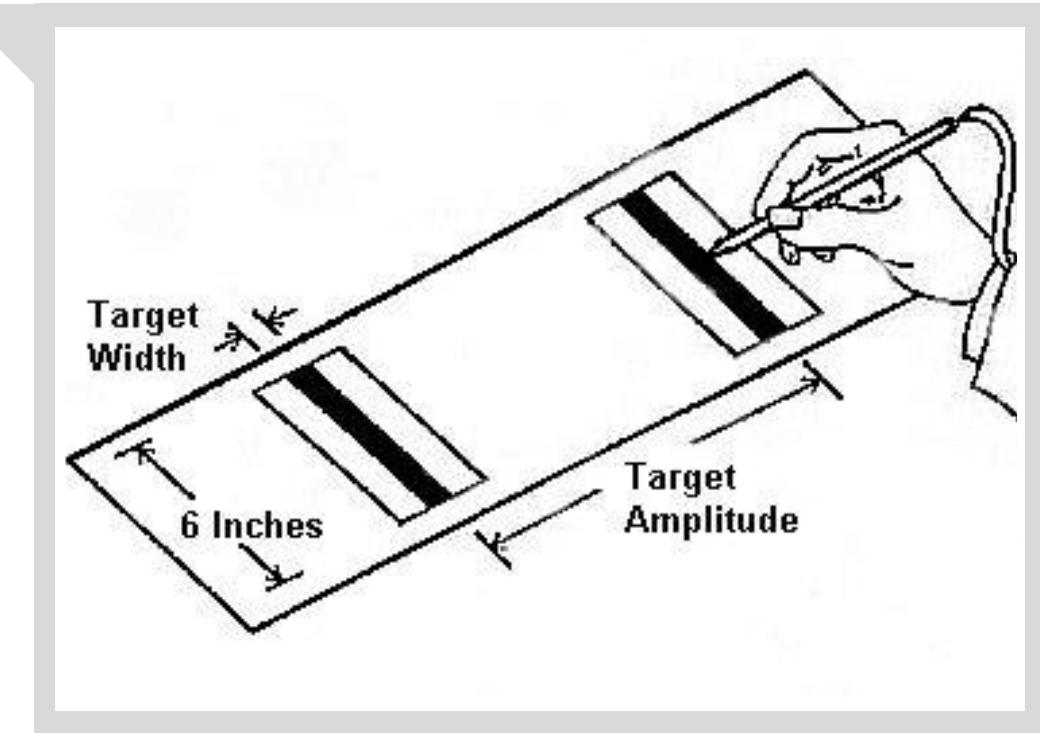
Ergonomics



**Nothing is ever
designed by chance
or accident.**

1954: Fitts' Law - A measure of human performance

A metric for understanding how fast a person can point at something on a display.



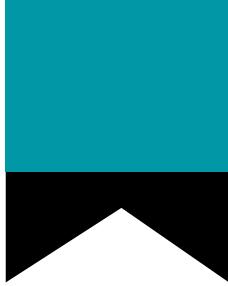
**The classics never really
go out of style:**





What's The Best Way To Arrange Your Apple Watch Apps? Redditor Frendargolargo Used Fitts' Law To Do It The Scientific Way





Why a paradigm shift?

- Hardware gets smaller/cheaper
- Use of computers extends beyond just number crunching
- People who use computers have different specialisations/needs
- Increased networking
- Innovation makes new interactions possible

2nd Wave of HCI:

Cognitive science & the mind of the user

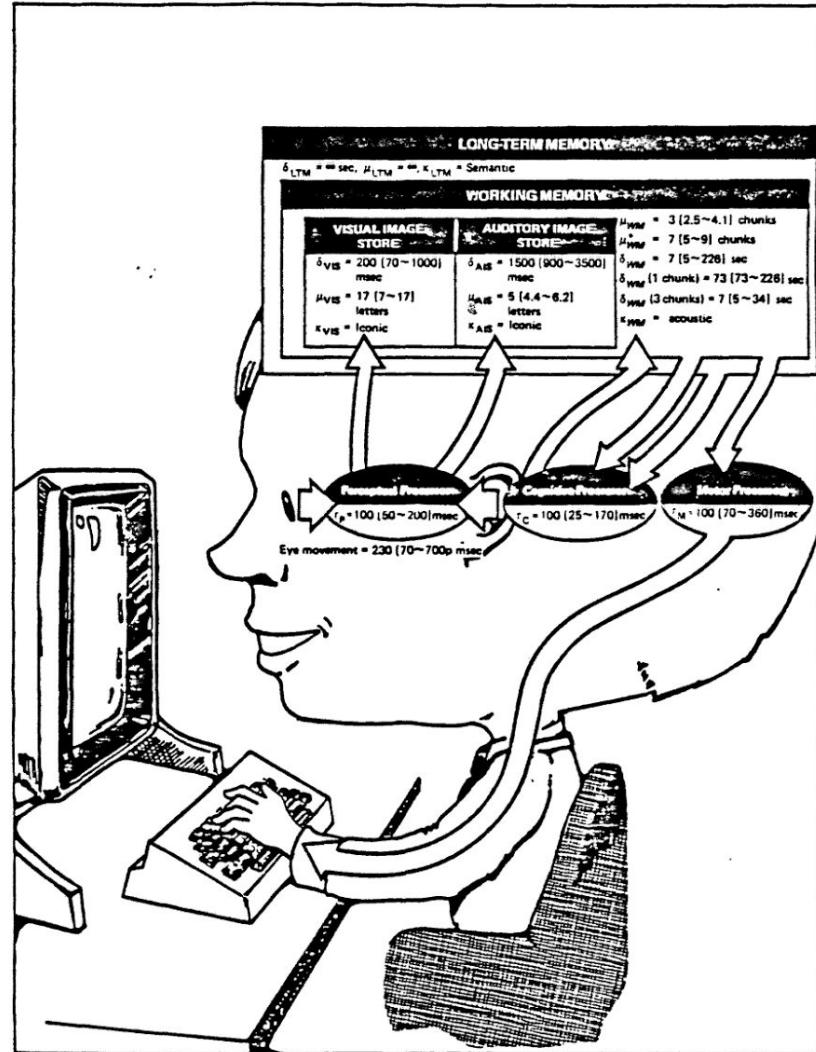
2nd Wave highlights:

- Considering the human mind and the computer as parallel, related systems
- Focus on the **context** of the interaction (particularly the workplace)

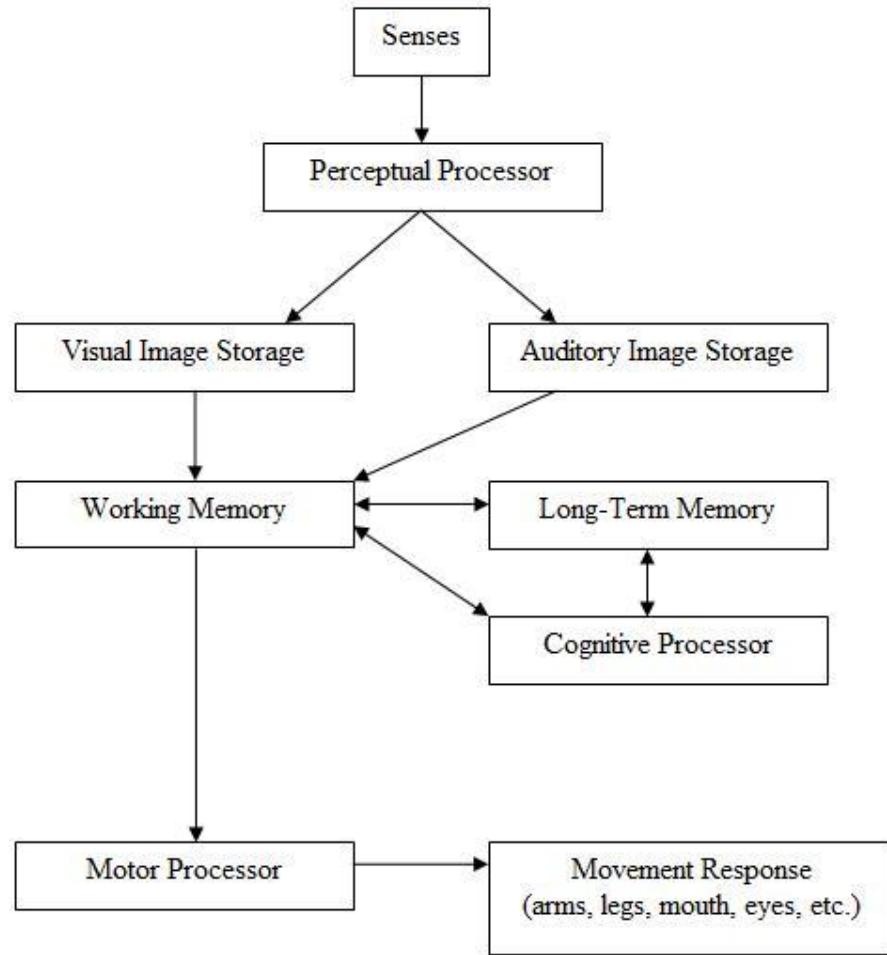
The Model Human Processor

Pioneered by Card, Moran & Newell (1986)

Came out of Xerox at Palo Alto
(around the time of the Xerox
Star)



The human processor model

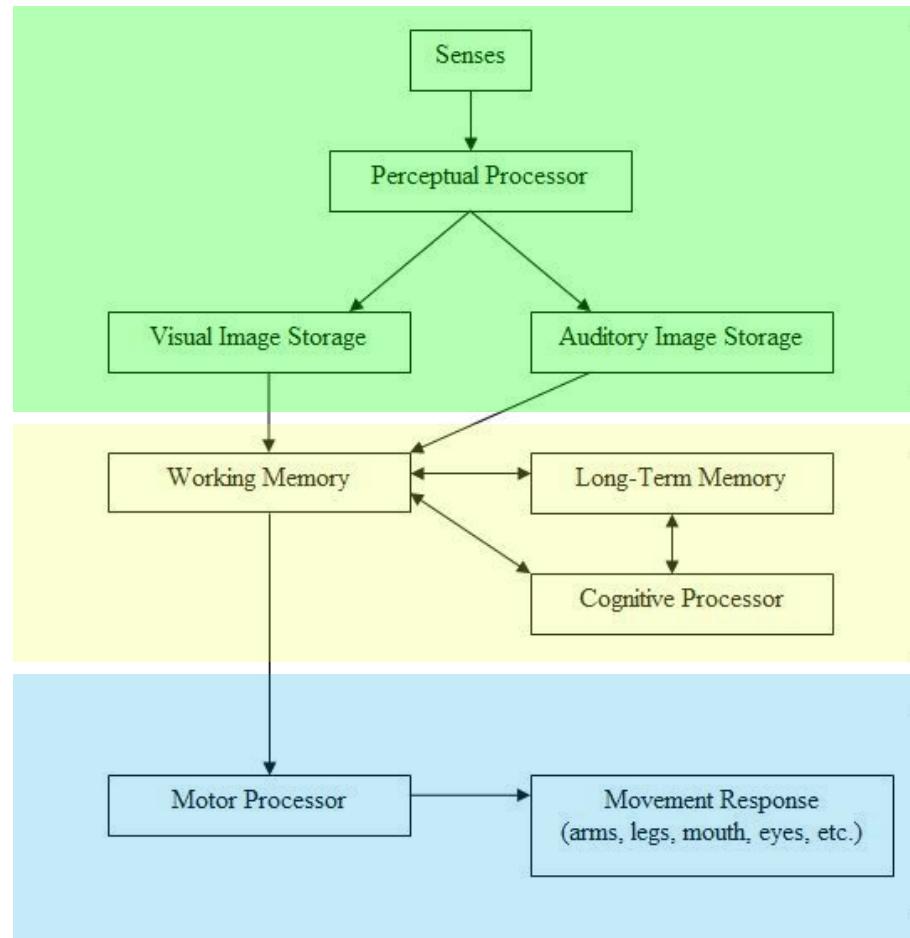


Three Subsystems:

Perceptual
(data goes in)

Cognitive
(data processed)

Motor
(data comes out)



Personal computing

Terminals, not mainframes

“Work” increasingly about manipulating digital data



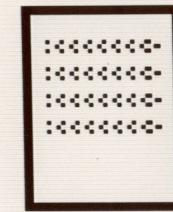
WIMP and the GUI bring archetypes:

A shared
language

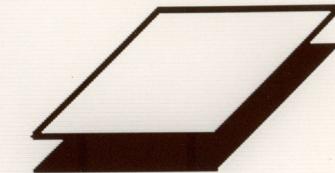
Evolution of “Document” Icon Shape



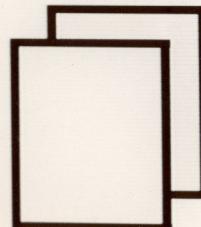
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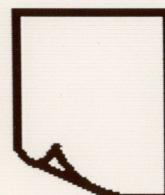
2.



3.



4.



5.



6.



7.

Soft Systems Methodology

A methodology for understanding problems that are:

- really big
- really complex
- might have lots and lots of solutions, all arguably correct.

**(Sounds pretty
user-centred to me.)**

Example:

**How should an input
device for surgery
nurses be designed?**

**What do you think it
should do?**

What should it look like?





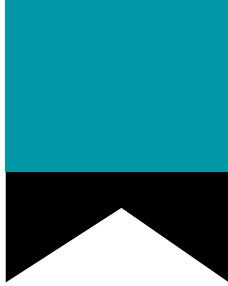


Understand the
context
and you will understand the
interaction



How ...

participatory.



Then what happened?

3rd Wave of HCl: The experience



2007:

The first smart
phone.



Isn't it just a
phone?

Yes.

But it had huge computing power, an array of sensors, and created demand for all the internet, all of the time.





Ubiquitous computing

Computing that can occur on any device, in any location, any setting, in any format, for any purpose.

Good Afternoon



Have a nice
DAY
-ALEX

LEARN SOMETHING
NEW TODAY

67°
a ghost that manifests itself
by noises and disorder

Events Tasks

2PM - 3PM CHESS CLASS

In 40 Min

2PM - 3PM DO LAUNDRY

In 40 Min



Friday, April 17th 2009 4:38 PM



INTERNET NAVIGATION CAR BACKUP PHONE

POWER	RADIO	MEDIA	STREAMING
4	Fake Plastic Tr...	RADIOHEADPLANET TELEX	RADIOHEADSTOP WHISPERING
5	Radiohead	RADIOHEADTHE BENDS	RADIOHEADROCKERS
6	The Bends	RADIOHEADNINH AND DRY	RADIOHEADI MIGHT BE WRONG
7		RADIOHEADI WOULDNT PART	
8			

1:18 3:31

mute << Play >> shuttle

Playlists Artists Songs

Outside Temp: 82°

74 off	75 3	76	70 71 72 off
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Buy tick

Singles &
returns by
destination

Day
Travelcards

Multiple
tickets
& children

Extensions
&
Other Tickets

Quick tickets

Single to
Zone 1

Return to
Zone 1

Day Travelcard
Zones 1-6

Buy Oyster

Buy new card

Touch card on yellow reader



Self checkout

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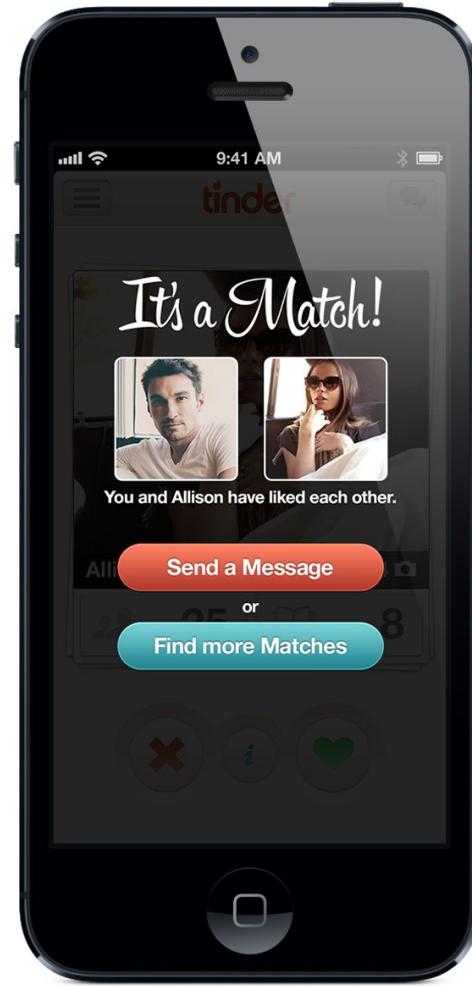
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**Computers aren't
just for work, or
tasks.**



Kayne the Argentum Warbreaker <Obsius Ordo>



WAR



**Computers are
becoming the place
where our social,
leisure, political, and
emotional lives happen.**

**What does this
mean?**

Bill Gaver (Goldsmiths)









Learn in Afshani



**How do computers
act as a mediator to
all this human stuff?**

Lifestyle > Tech > News

Facebook will have more dead people than living ones by the end of the century, researcher claims

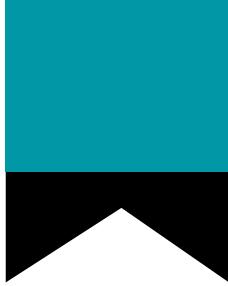
When you die, Facebook turns your page into a 'memorial' — leaving a kind of digital graveyard as more and more people pass away

Andrew Griffin | @_andrew_griffin | Monday 7 March 2016 |  1 comment



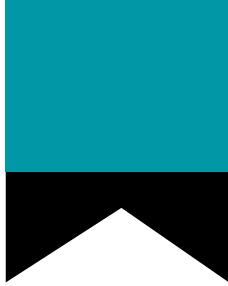
What do you think?





In summary ...

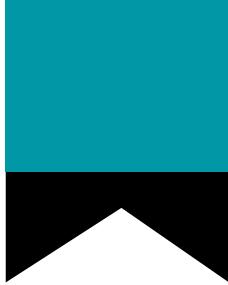
We can look at the history of HCI
as three **overlapping,**
intersecting paradigms.



1st Wave

Concerned with human/machine fit, ergonomics.

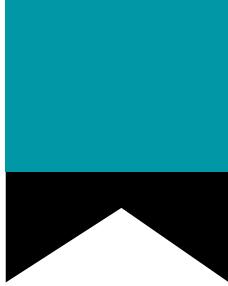
Brought about by computers existing!



2nd Wave

Concerned with cognitive science and the mind of the user.

Brought about by technology that made personal computing possible, and an effort to understand **context** of the user.



3rd Wave

Concerned with the experience of
the user.

Brought about by ubiquitous
computing.

Week 6, Part 2:
**Assignment 1
feedback**





Many things
were done
really well.

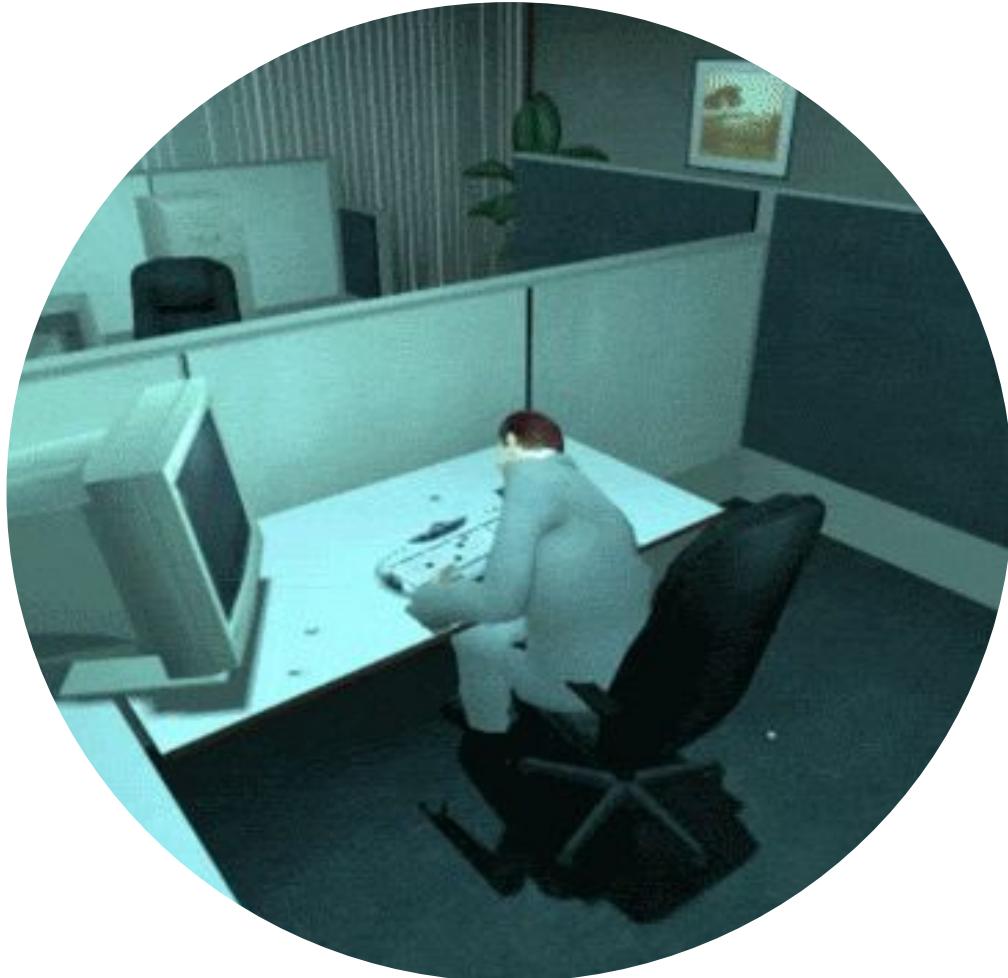
1. Good stakeholder selections
2. Thought applied to data gathering
3. Reports well written
4. Generally good designs





**Some things ...
not so much**

1. Data credibility
2. Data gathering
3. Assumptions and generalisations
4. Sloppiness with ethics
5. Missing parts of the assignment



1. Credibility of data



Credibility of research is important.

- How many people filled out your survey?
- Where did you find them?
- How do you know what they're telling you is useful?
- If you use it, CITE IT!

2. Data gathering



Choosing your data gathering methods

The point is to gather good data.

It does not matter at all if your approach is easy, cheap or saves paper if it doesn't gather good data.



Poor questions result in poor data.

You want to know about
BEHAVIOURS.

“Do you like this” is useless.



Design and data are not mutually exclusive.

Design and data are not mutually
exclusive.



3. Assumptions and generalisation



Be really careful with generalisations.

“Old people are scared of technology.”

“Students are all geniuses who love data.”

“Girls are only interested in clothes.”



4. This work needs
to be done
carefully



(seriously)



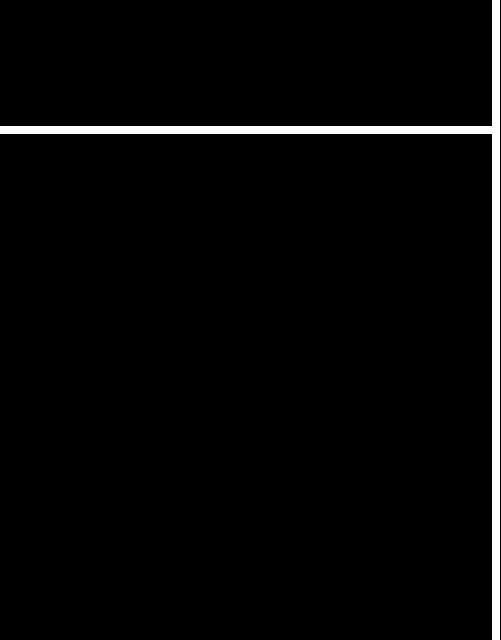
Ethics matters.

Be careful gathering data on children, the elderly, those with learning difficulties, or any other vulnerable group.



Privacy matters.

Do not publish phone numbers in your results.



5. Read the requirements of the assignment.



Make sure you do all of the assignment.

We can't give you marks for what's not there!

The TAs
have
provided
really good
feedback.

Read it and look at what you could improve at the implementation stage.

This is the time to change things that need to be changed!

This is a **learning experience** - reflect on what you've learned

Do not freak out - this is 10% of your mark.



Now implement!

