

# Human-Computer Interaction (HCI)

DEC02500/7250

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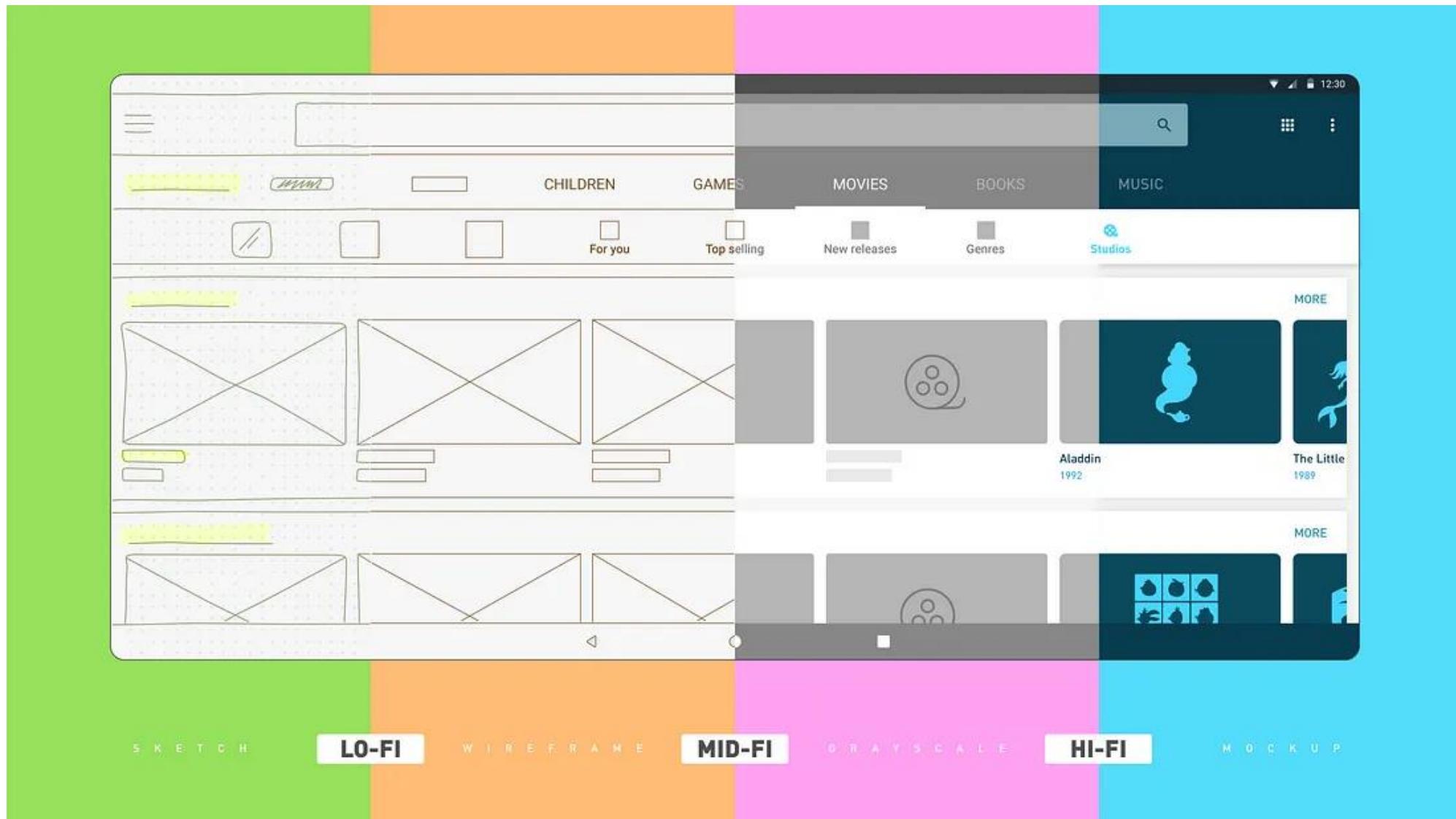
# 05

## Cognition

# In this session...

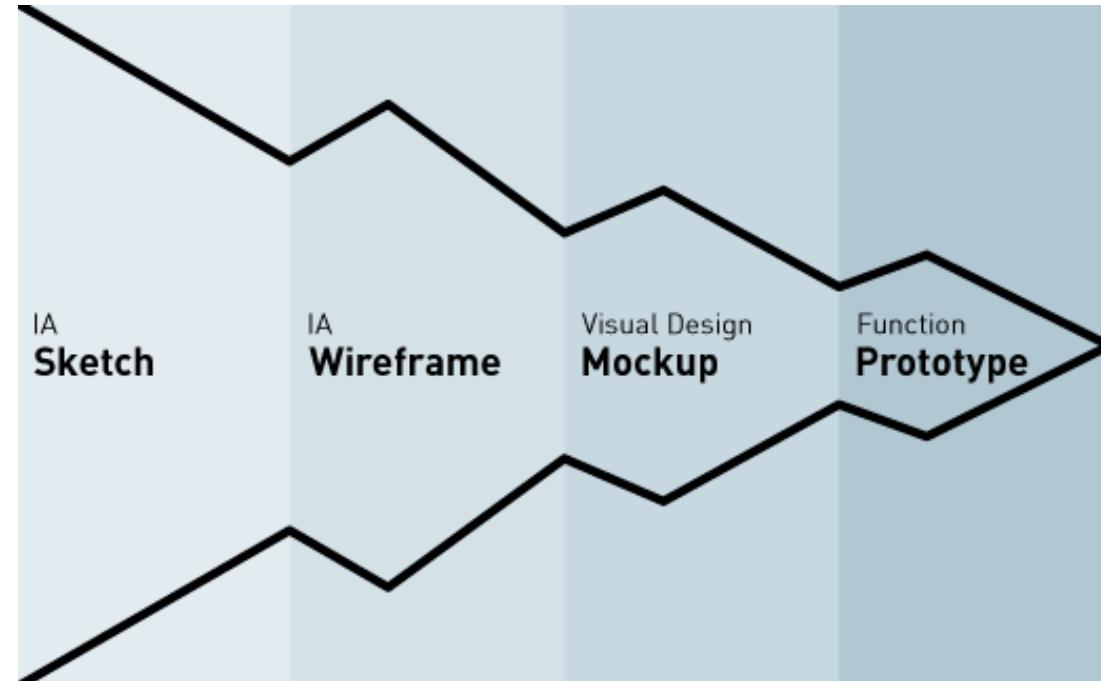
- Prototyping (part 2)
- Interaction Flow
- Cognition
- Distributed Cognition
- Persuasive Design
  - Nudging and Dark Patterns
- DECO7250 HCI Annotated Bibliography

# The Fidelity Continuum



# The Fidelity Continuum

- “Design methods are not mutually exclusive. Rather, each method exists on a continuum of fidelity,”  
[uxBooth](#)
- There’s a balance that needs to be established between time, resources and fidelity
- The optimal level of fidelity is the minimum amount of fidelity needed to get the job done

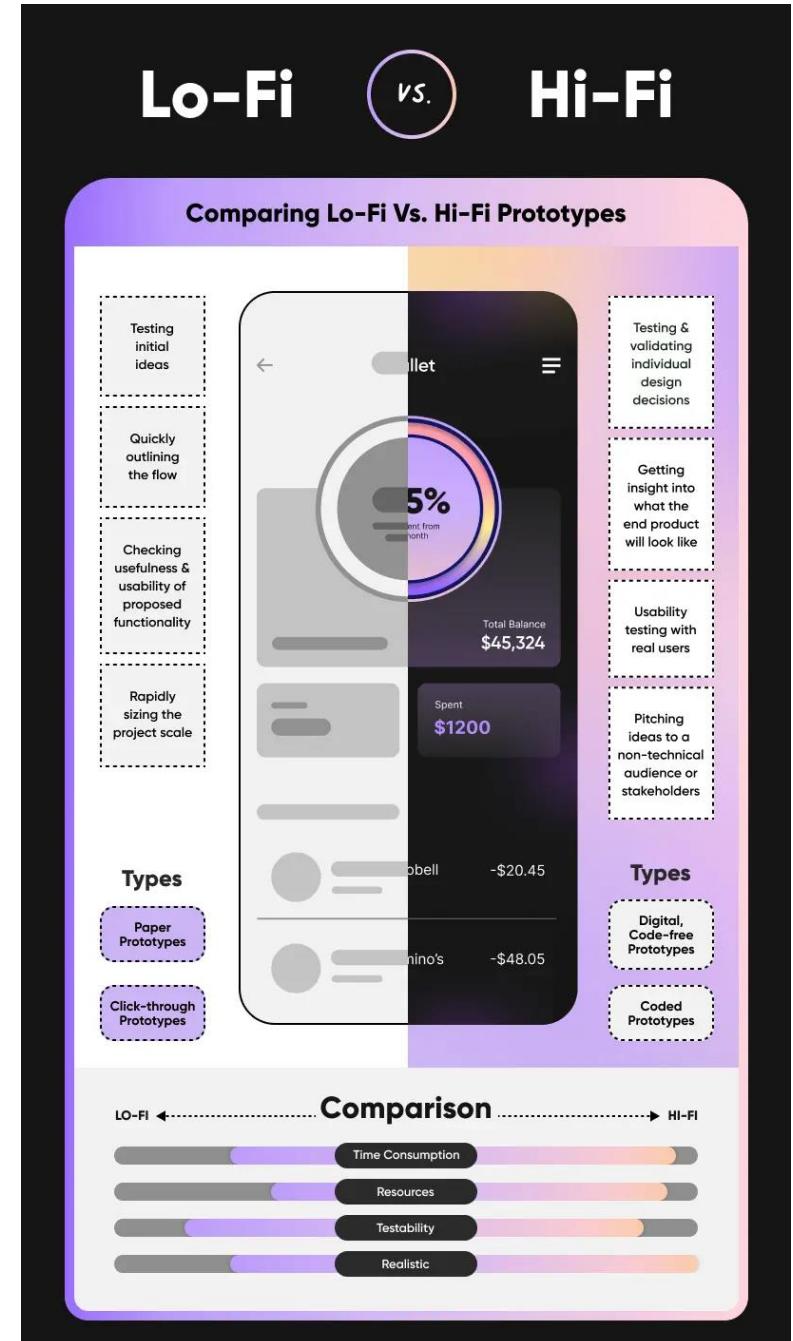


# Prototyping

	<b>Sketches</b>	<b>Higher Fidelity</b>
Format	Paper	Digital (no-code)
Purpose	Clarify initial mental model, as well as quality and suitability of envisaged solution	Identifying usability issues, requirements, and interactivity
Interfaces	Rough representation of interfaces.	Clear representation of UI layout and features (closer to the final solution)
UI colour	<u>No colour</u> unless strong contextual need.	More realistic to the final solution
Interactions	Rough representation of how system might work through moving paper around.	Supports natural/ close-to-real interaction throughout system, and key features.

# Prototyping

- **Low-fidelity:** quick and simple way of evolving an initial idea
  - Goal is to outline the flow and to check the usefulness and usability of your proposed functionality
    - Paper prototypes
    - Click-through prototypes
- **High-fidelity:** More advanced, with their aesthetics and functions and far closer to that of the final product
  - Created further along in the process once a team has a firm grasp of what they want the finished product to embody, using prototyping software
  - Generally used for usability testing with real users or to get final design approval from stakeholders
    - Digital, code-free prototypes
    - Coded prototypes

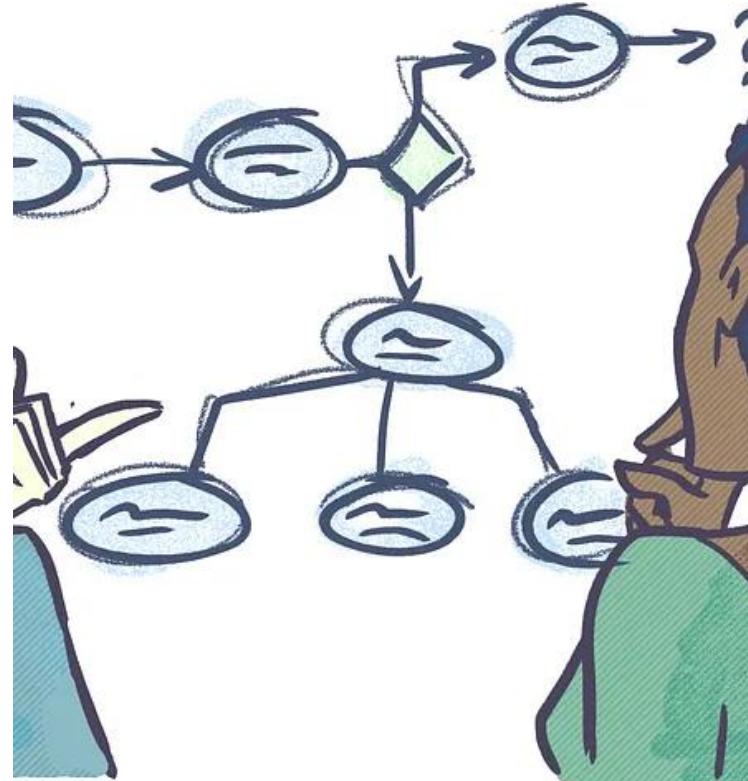


# Prototyping Software Tools

- Software Tools such as (Adobe XD, Figma, InVision ...etc. )
- Common Features:
  - Create Interfaces
    - Vector drawing/graphic design tools
    - A way to manage ‘screens’
  - Create Interactions
    - A way to connect buttons and UI elements with other screens
  - Support Feedback
    - One or more ways to share or test the created prototype.

# Interaction Flow Diagrams

- Interaction (IX) Flow Diagrams provide a visualization that is made up of all the screens of your system that are connected with lines and arrows to illustrate how the user interacts with the system
- Like the lines of a flowchart, the direction of the arrow following the function of the shape indicates the flow of interaction
- If there are decisions in the system, a diamond symbol can be added
- Each flow change from one task to another is explained through separate text outside the frame
- The thoroughness of the IX Flow can be intimidating, but communicating these interactions has many benefits:
  - Centralizes the flow, visual design, and interactions in one document
  - Can be exported as a PDF, JPEG, etc. so this document can be viewed on any desktop
  - Reduces guesswork and ambiguity on the developer's part
  - Reduces mistakes during development



# Micro-Interactions

- “Contained product moments that revolve around a single use case” Dan Saffer, *Microinteractions: Designing with Details*
- Invisible microinteractions can enhance our user experience
- When microinteractions are well designed, they help us navigate, instructs us on how to use technology, prevents us from making errors, and ultimately engages us and keeps us engaged
- Design isn’t just aesthetics. It’s a marriage of form and function.



# Micro-Interactions



**TRIGGER**



**RULES**



**FEEDBACK**



**LOOPS & MODELS**

User-initiated or system-initiated action that starts the microinteraction

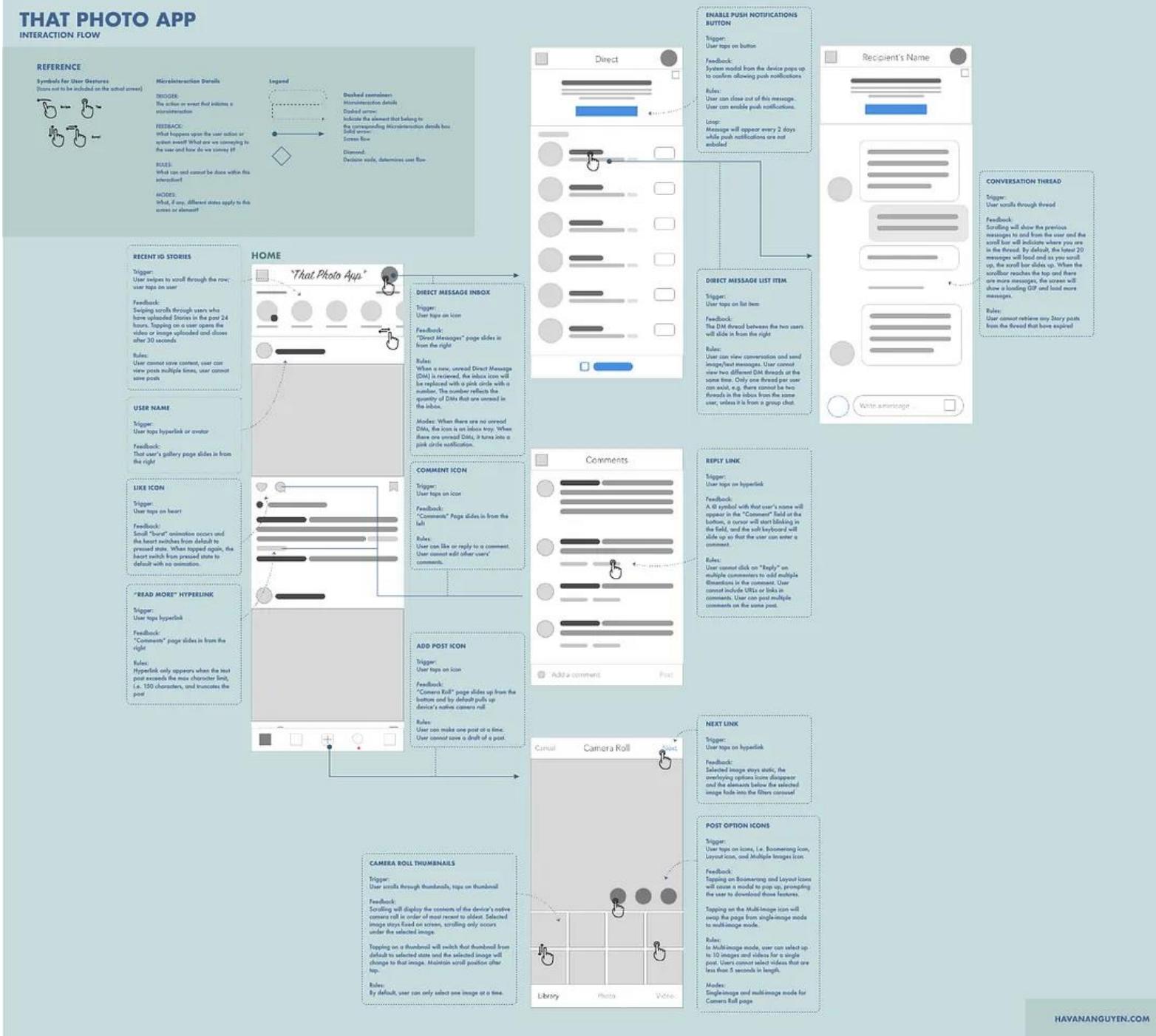
Capabilities and constraints in the microinteraction; what can and cannot be done

The visual cues that tell the user what is happening

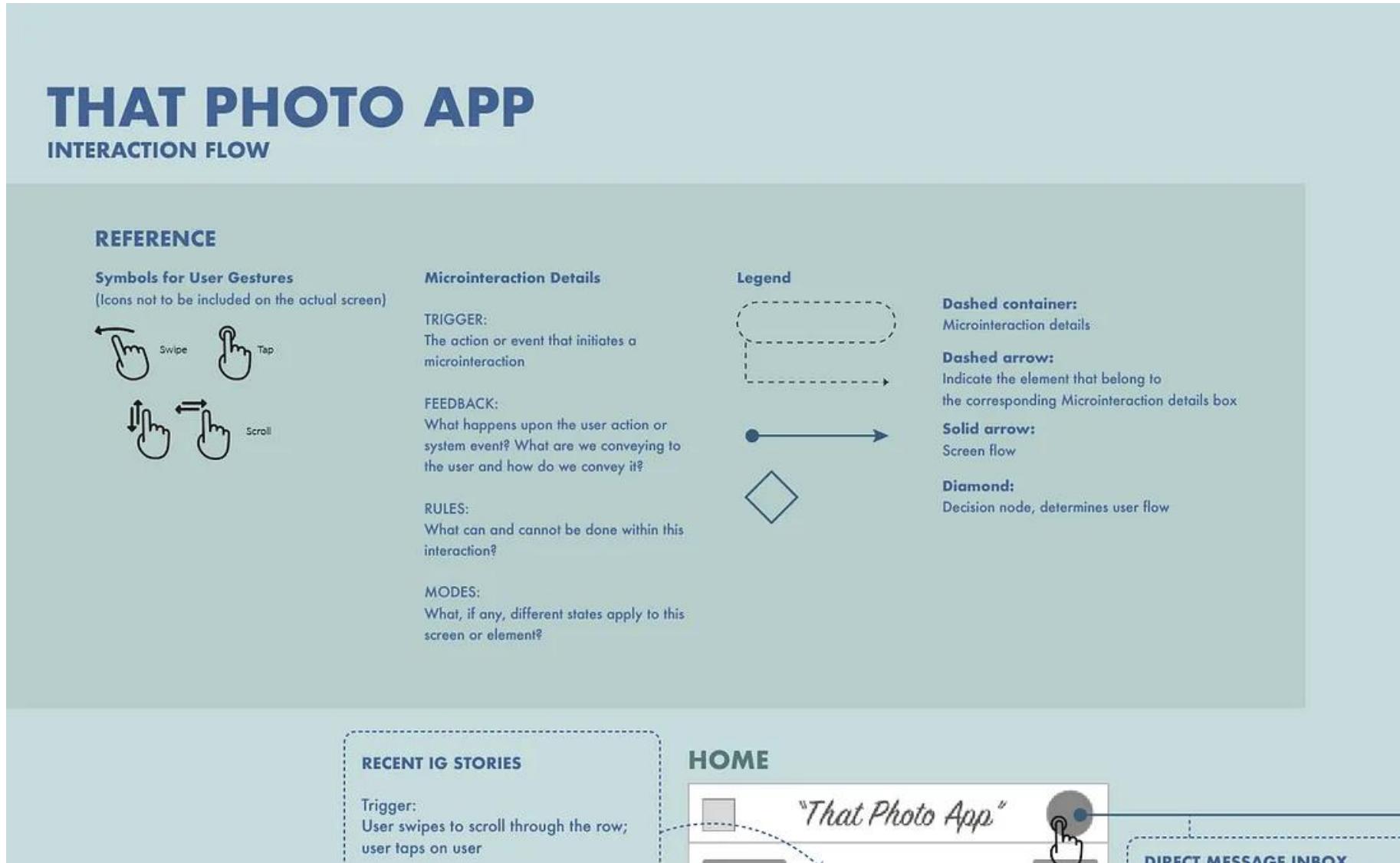
The repeatability and lifecycle of a microinteraction

# THAT PHOTO APP

INTERACTION FLOW



# The Reference Panel



# Wireframes/Prototype Screens

**RECENT IG STORIES**

**Trigger:** User swipes to scroll through the row; user taps on user

**Feedback:** Swiping scrolls through users who have uploaded Stories in the past 24 hours. Tapping on a user opens the video or image uploaded and closes after 30 seconds

**Rules:** User cannot save content, user can view posts multiple times, user cannot save posts

**USER NAME**

**Trigger:** User taps hyperlink or avatar

**Feedback:** That user's gallery page slides in from the right

**LIKE ICON**

**Trigger:** User taps on heart

**Feedback:** Small "burst" animation occurs and the heart switches from default to pressed state. When tapped again, the

**HOME**

"That Photo App"

**DIRECT MESSAGE INBOX**

**Trigger:** User taps on icon

**Feedback:** "Direct Messages" page slides in from the right

**Rules:** When a new, unread Direct Message (DM) is received, the inbox icon will be replaced with a pink circle with a number. The number reflects the quantity of DMs that are unread in the inbox.

**Modes:** When there are no unread DMs, the icon is an inbox tray. When there are unread DMs, it turns into a pink circle notification.

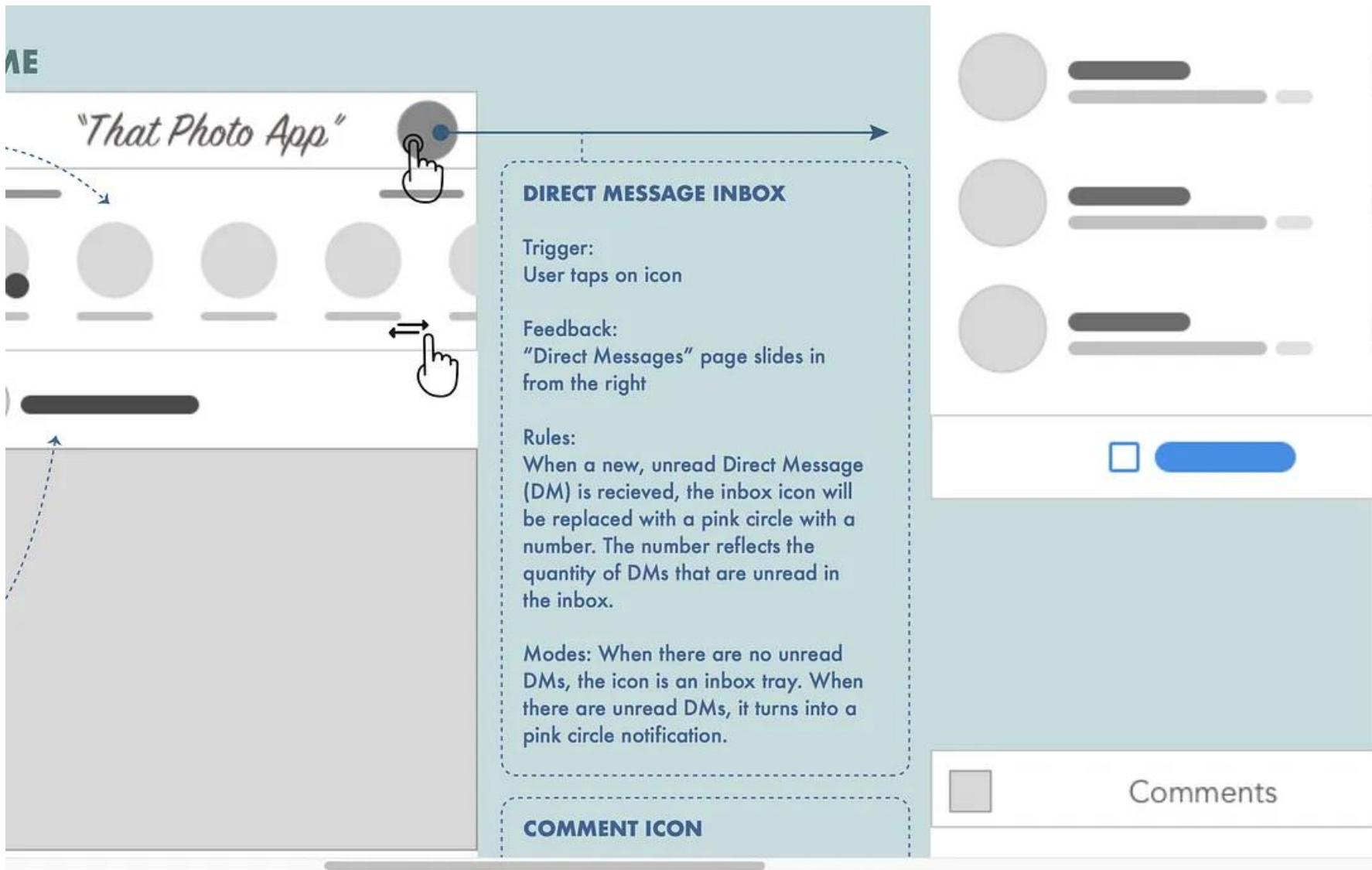
**COMMENT ICON**

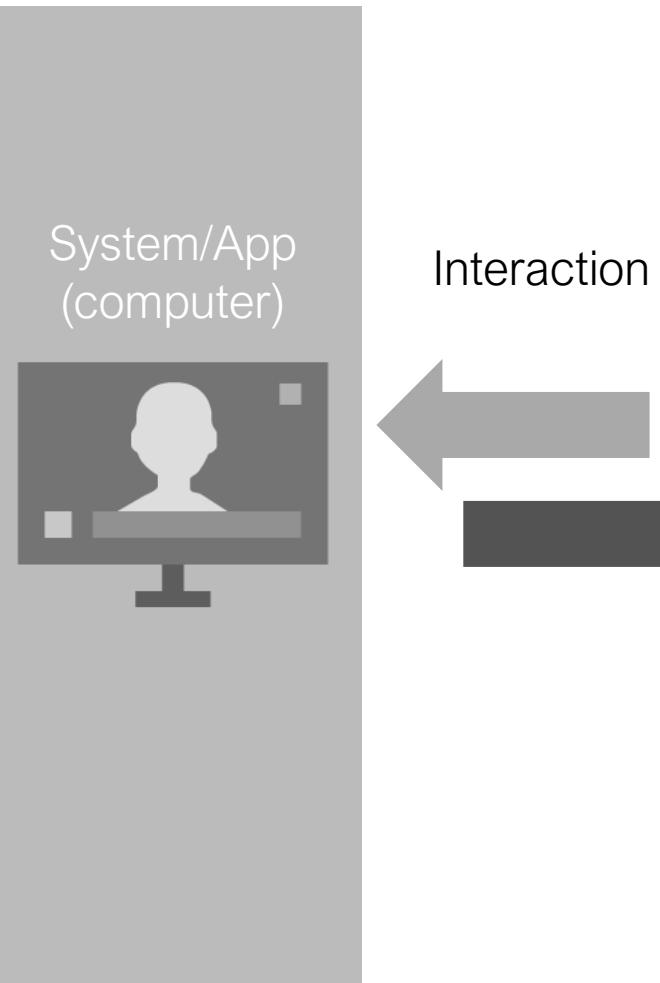
**Trigger:** User taps on icon

**Feedback:** "Comments" Page slides in from the left

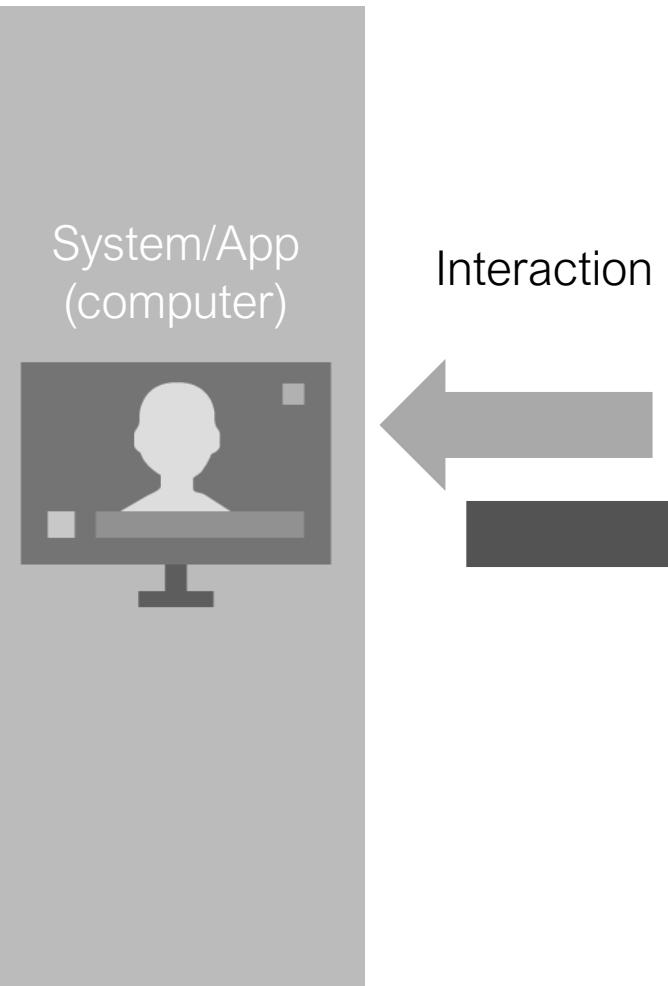
**Rules:** User can like or reply to a comment.

# Arrows, Lines, and Containers





Continuing to investigate the human side of our interaction 'equation' focusing on how cognition influences that interaction



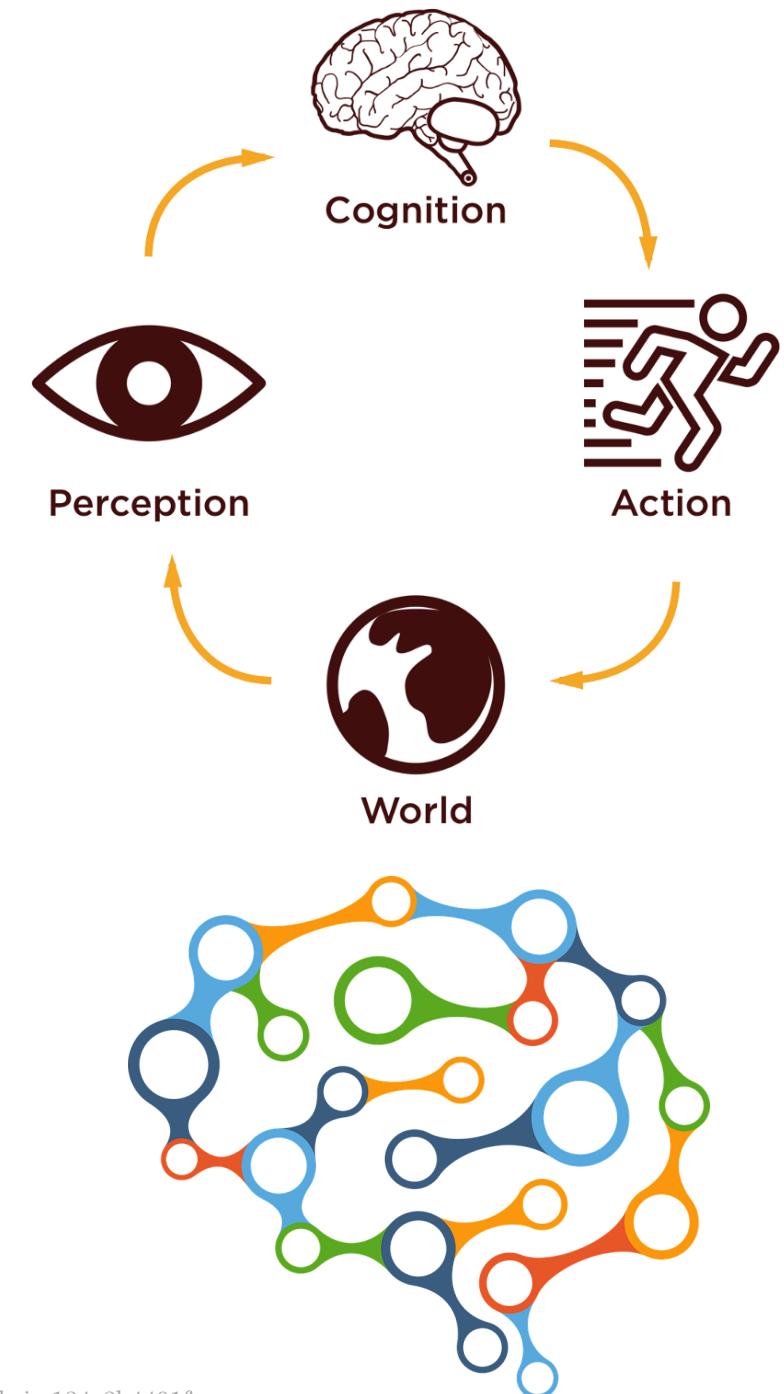
## Cognition

### Specific processes:

- Attention
- Perception & Recognition
- Memory
- Learning
- Reading, speaking & listening
- Problem solving, planning, reasoning & decision making

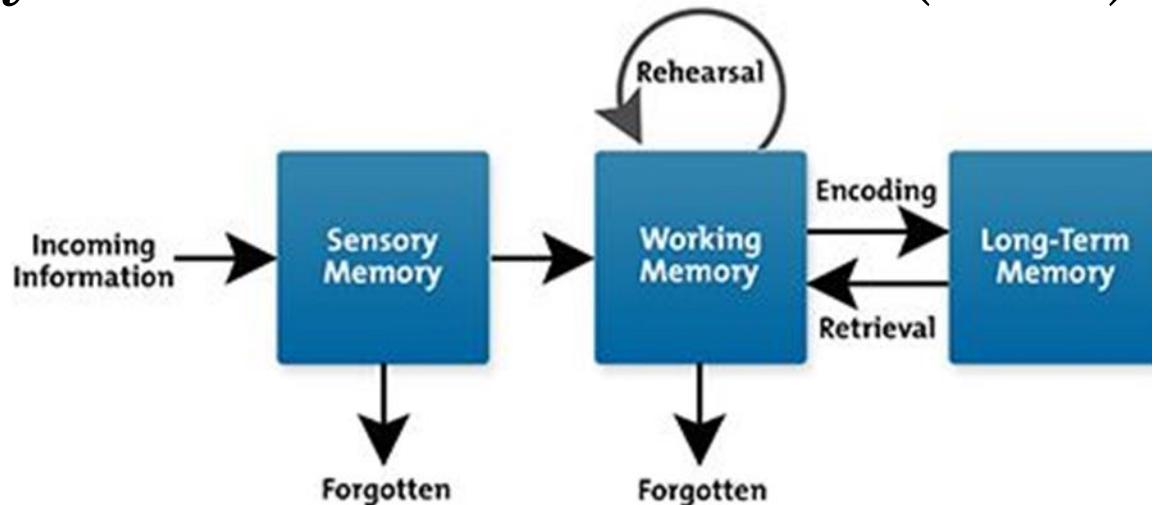
# Cognition

- “*The mental action or process of acquiring knowledge and understanding through thought, experience, and the senses*” – Oxford Dictionary
- HCI attempts to understand and represent how humans and computing systems interact in transmitting information



# Cognitive Load Theory

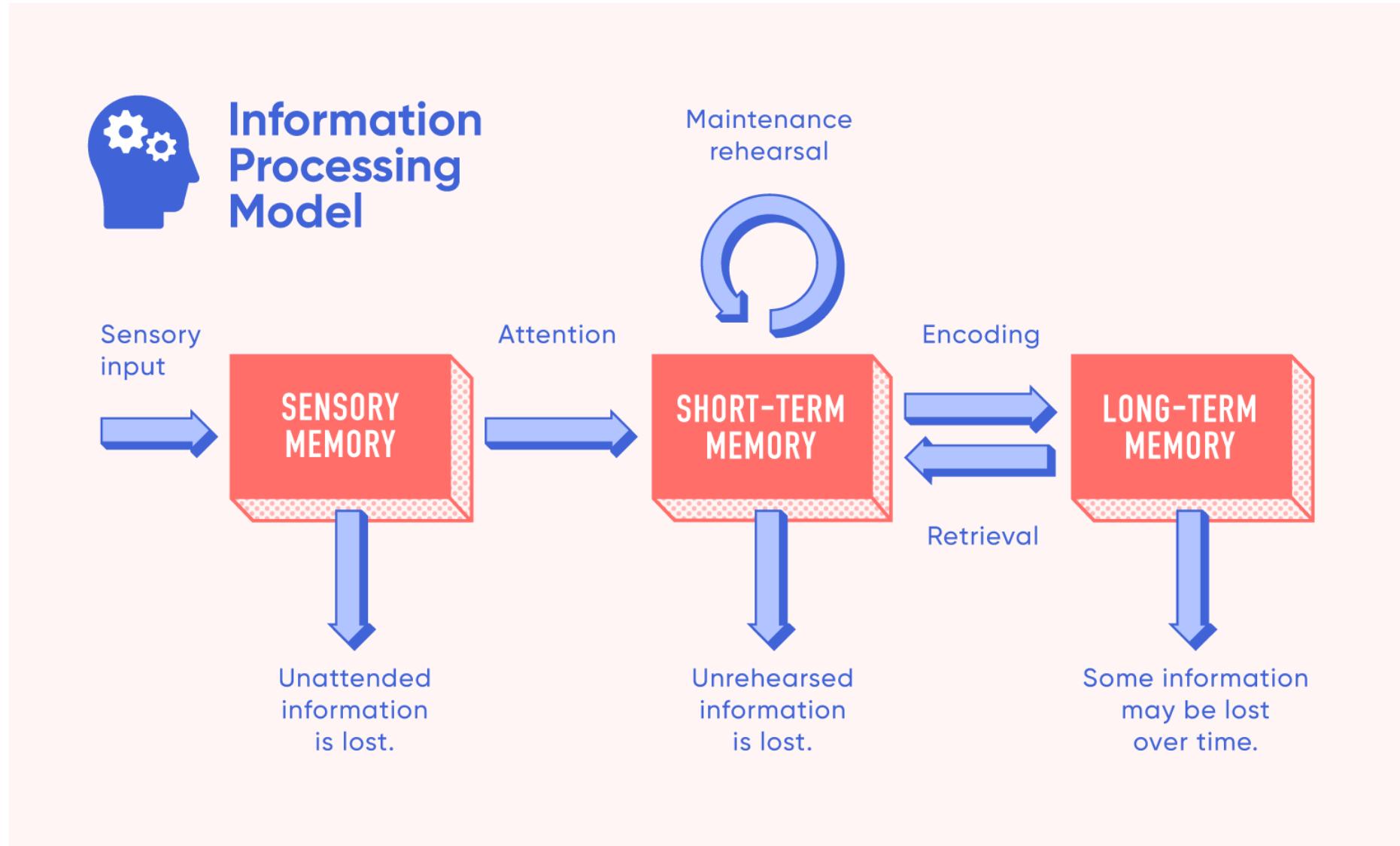
- Cognitive load = the amount of information that working memory can hold at one time
- Cognitive Load Theory, developed by Sweller (1988), builds on the information processing model (below), developed by Atkinson and Shiffrin (1968)



Sweller, J., 1988. Cognitive load during problem solving: Effects on learning. *Cognitive Science*, 12(2), pp.257-285.  
[https://doi.org/10.1207/s15516709cog1202\\_4](https://doi.org/10.1207/s15516709cog1202_4)

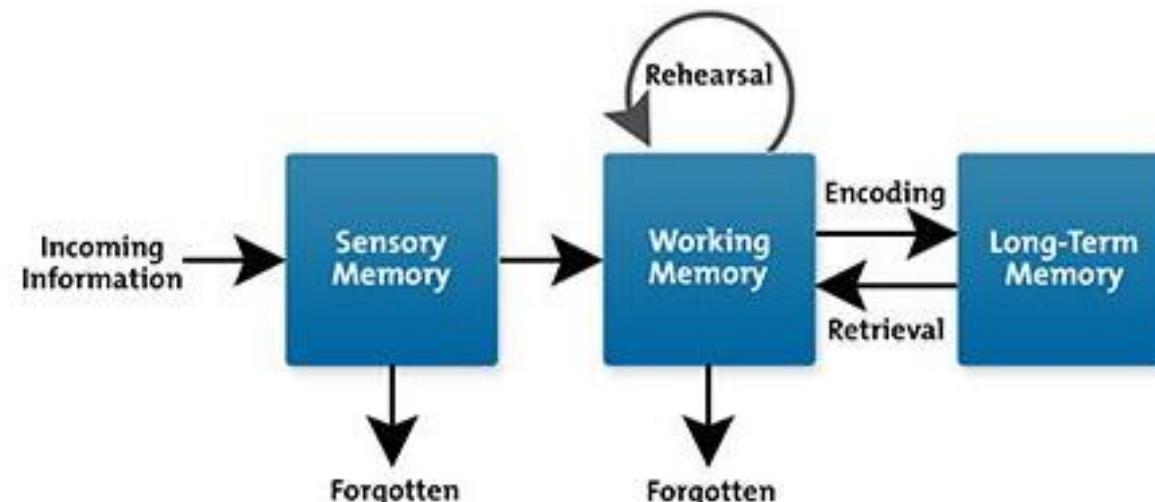
Atkinson, R.C. and Shiffrin, R.M., 1968. Human memory: A proposed system and its control processes. In *Psychology of learning and motivation* (Vol. 2, pp. 89-195). Academic press. [https://doi.org/10.1016/S0079-7421\(08\)60422-3](https://doi.org/10.1016/S0079-7421(08)60422-3)

# Information Processing Model



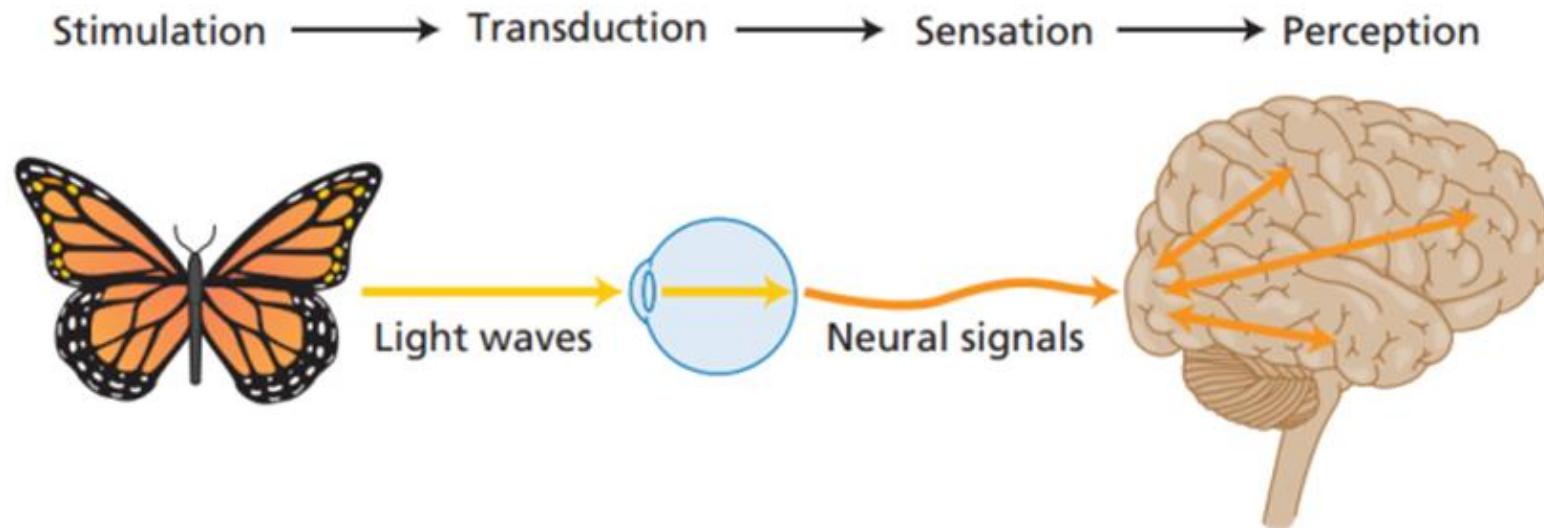
# Information Processing Model: Memory

- We *encode*, *store* and then *retrieve* knowledge
- We remember what we have *attended* to
- *Context* is an important cue to memory retrieval
- We *recognize* things better than we *recall* things



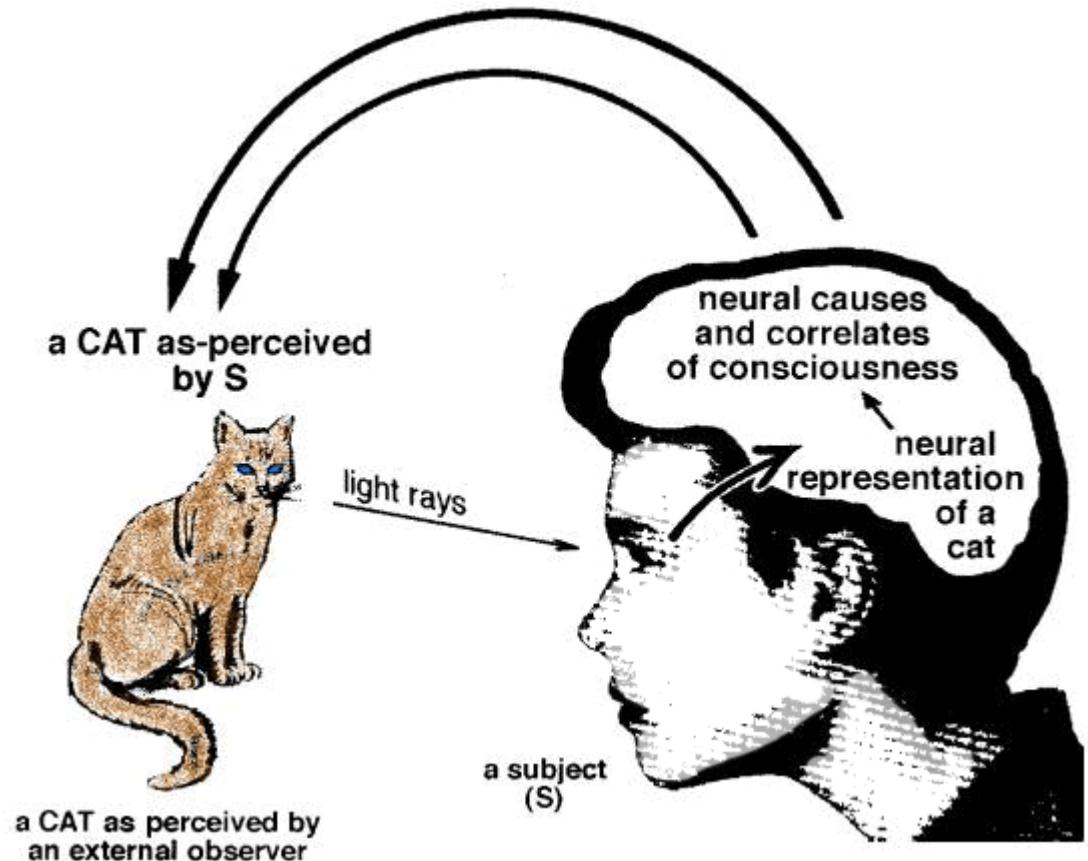
# Sensation and Perception

- Sensation = capacity to have a physical feeling or awareness by receiving information from environmental stimuli through our senses
- Perception = becoming aware of, organizing, and interpreting this information so that it makes sense to us



# Perception and Recognition

- Perception is the sensory experience of the world
- Involves both recognizing environmental stimuli and actions in response to these stimuli
- It is also necessary for the brain to categorize and interpret what you are sensing
- Recognition is the ability to interpret and give meaning to the object

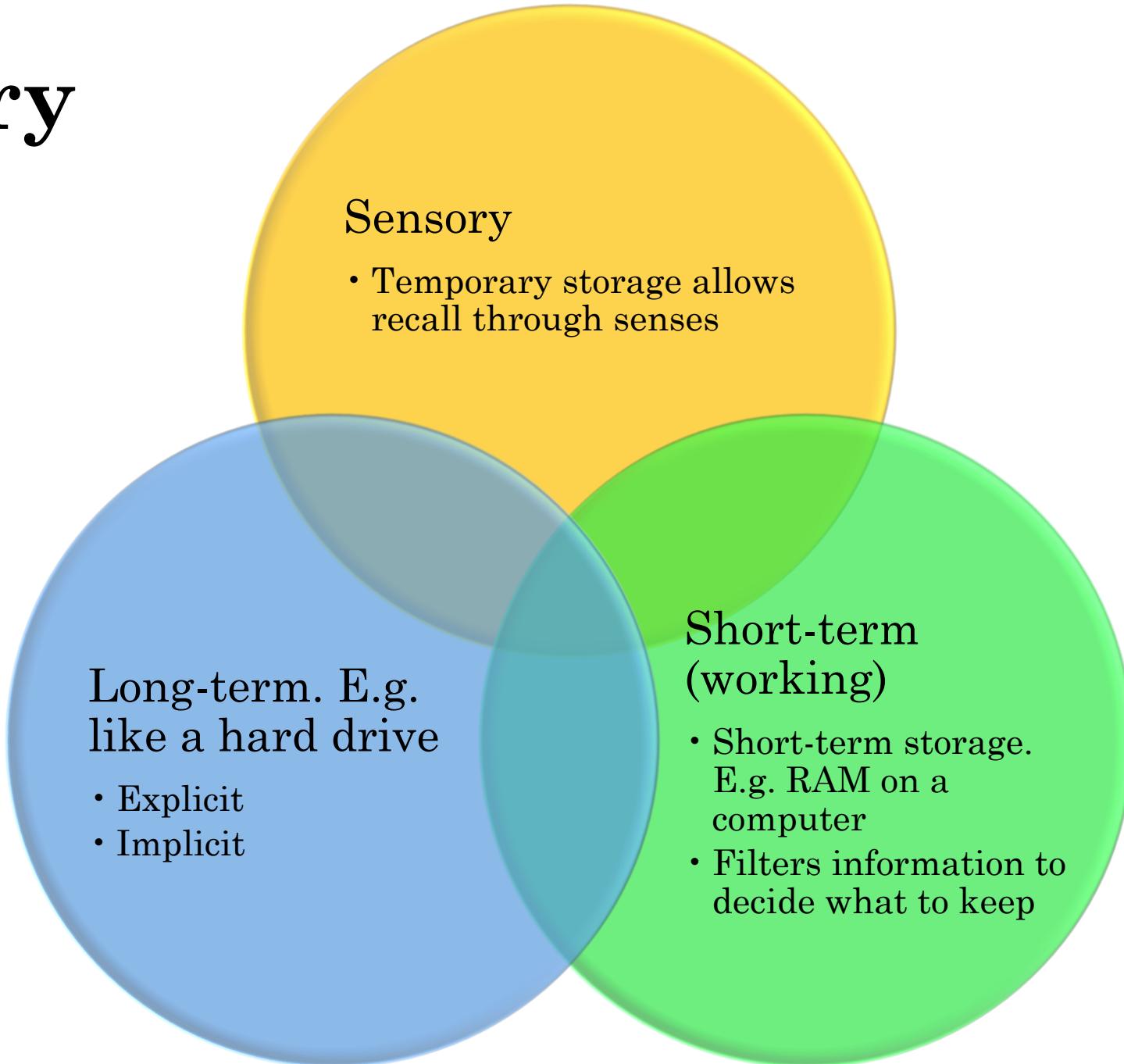




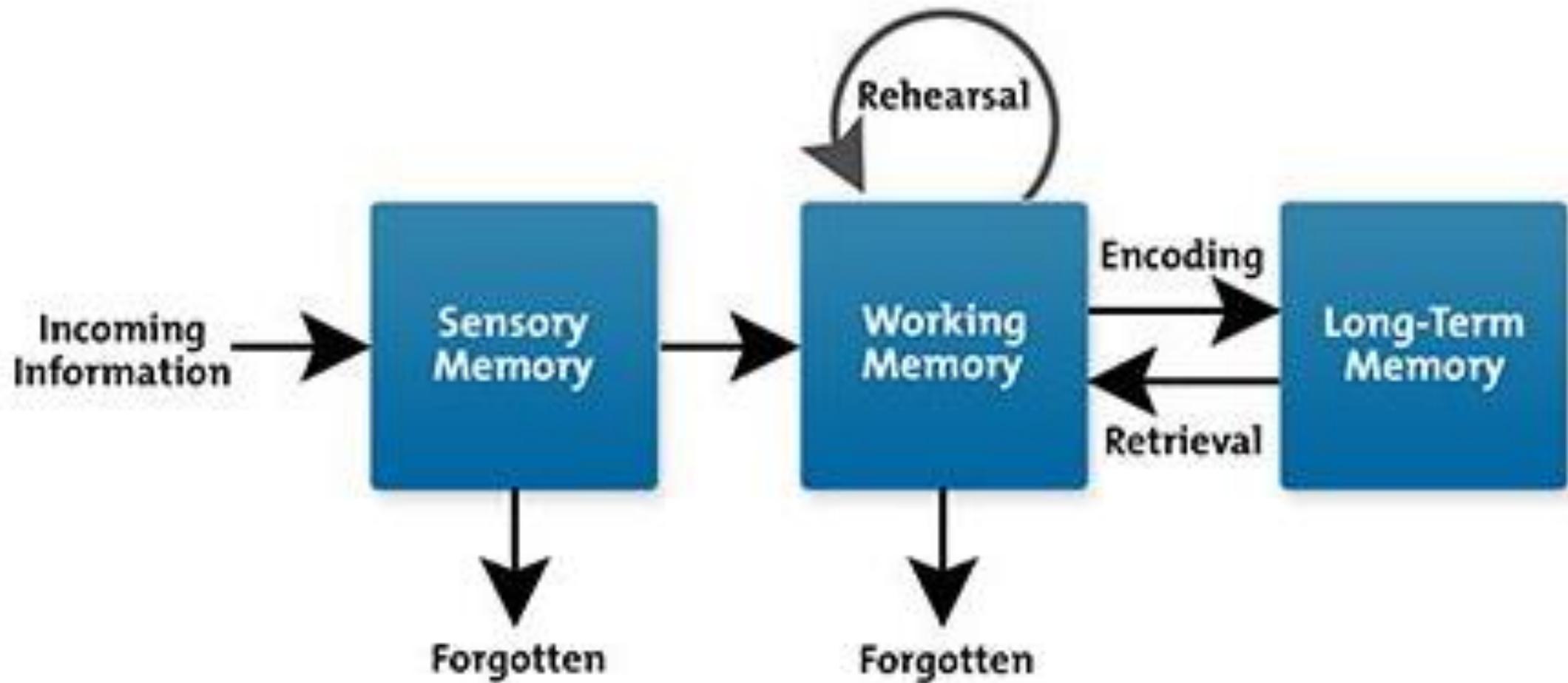
My Wife and My Mother-In-Law, by the cartoonist W. E. Hill, 1915.

This media file is in the public domain in the United States. This applies to U.S. works where the copyright has expired, often because its first publication occurred prior to January 1, 1923.

# Memory

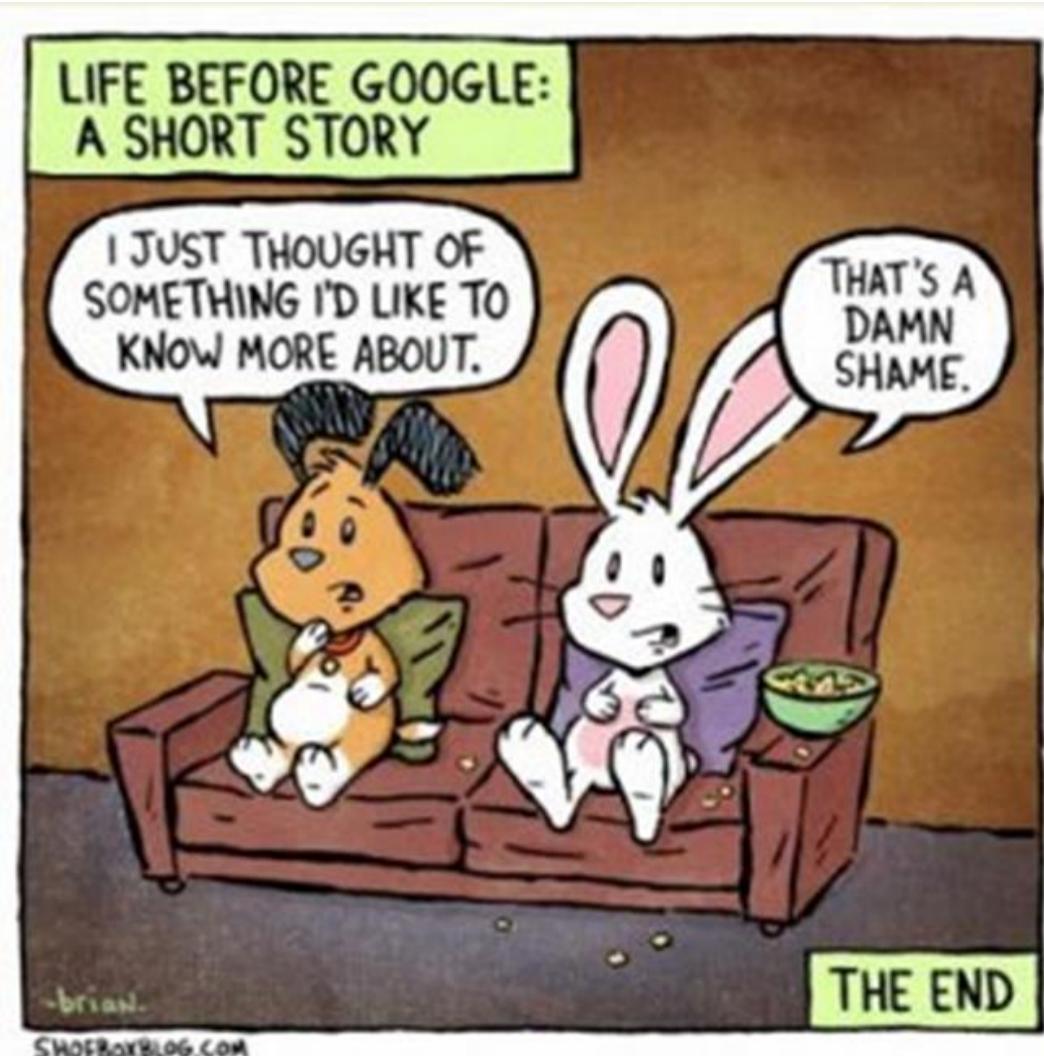


# Memory



# Memory

- Technology has changed the way human memory works
- Can you remember a time before the internet existed?



# Memory



Technology has changed the way  
human memory works



The Google Effect (digital amnesia) is  
a phenomenon whereby we forget  
information if it can easily be found  
online



A study by Sparrow et al. (2011) found  
that participants that thought that  
information would be stored on a  
computer were less likely to remember  
the information

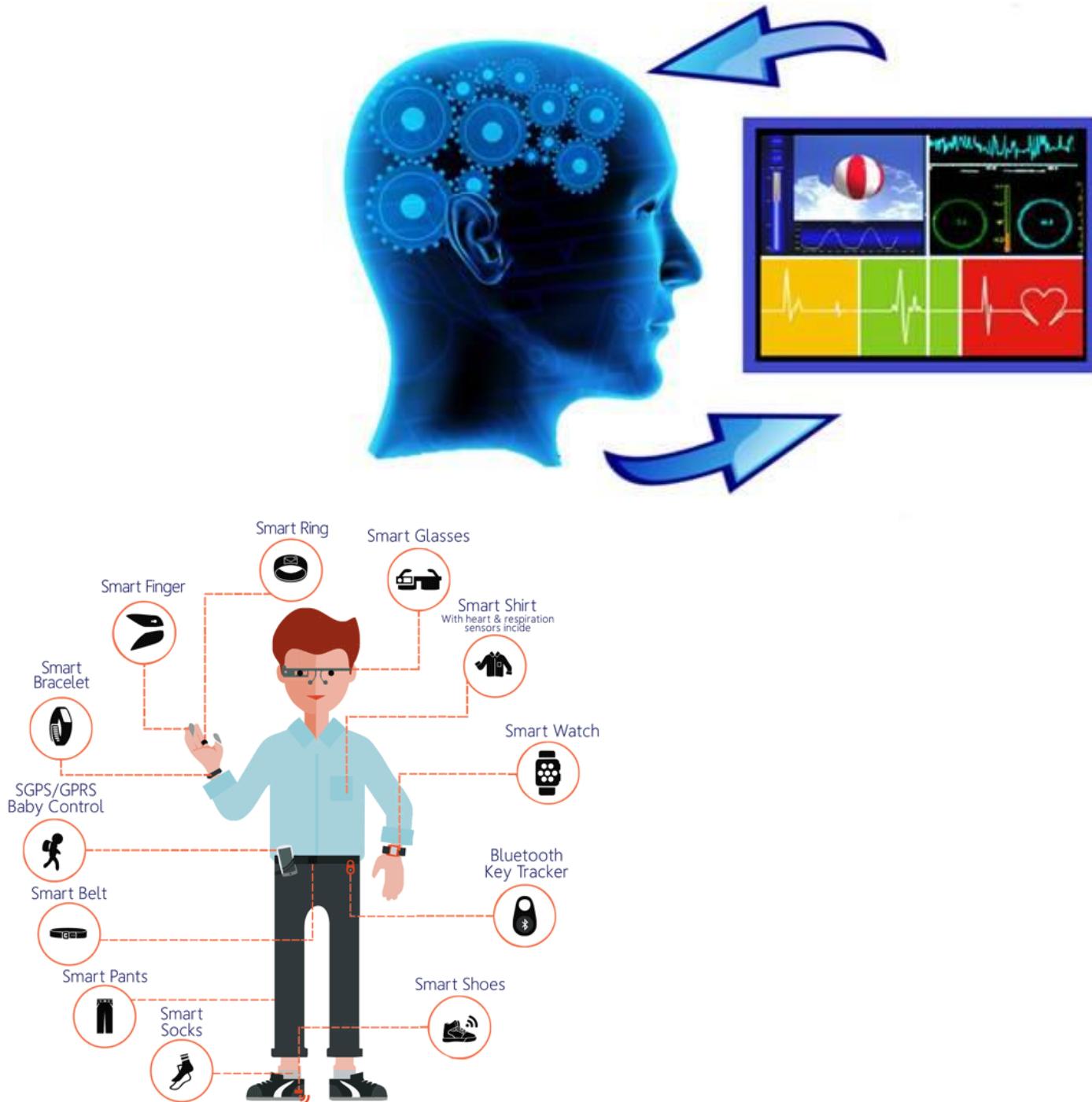
# Memory Aids

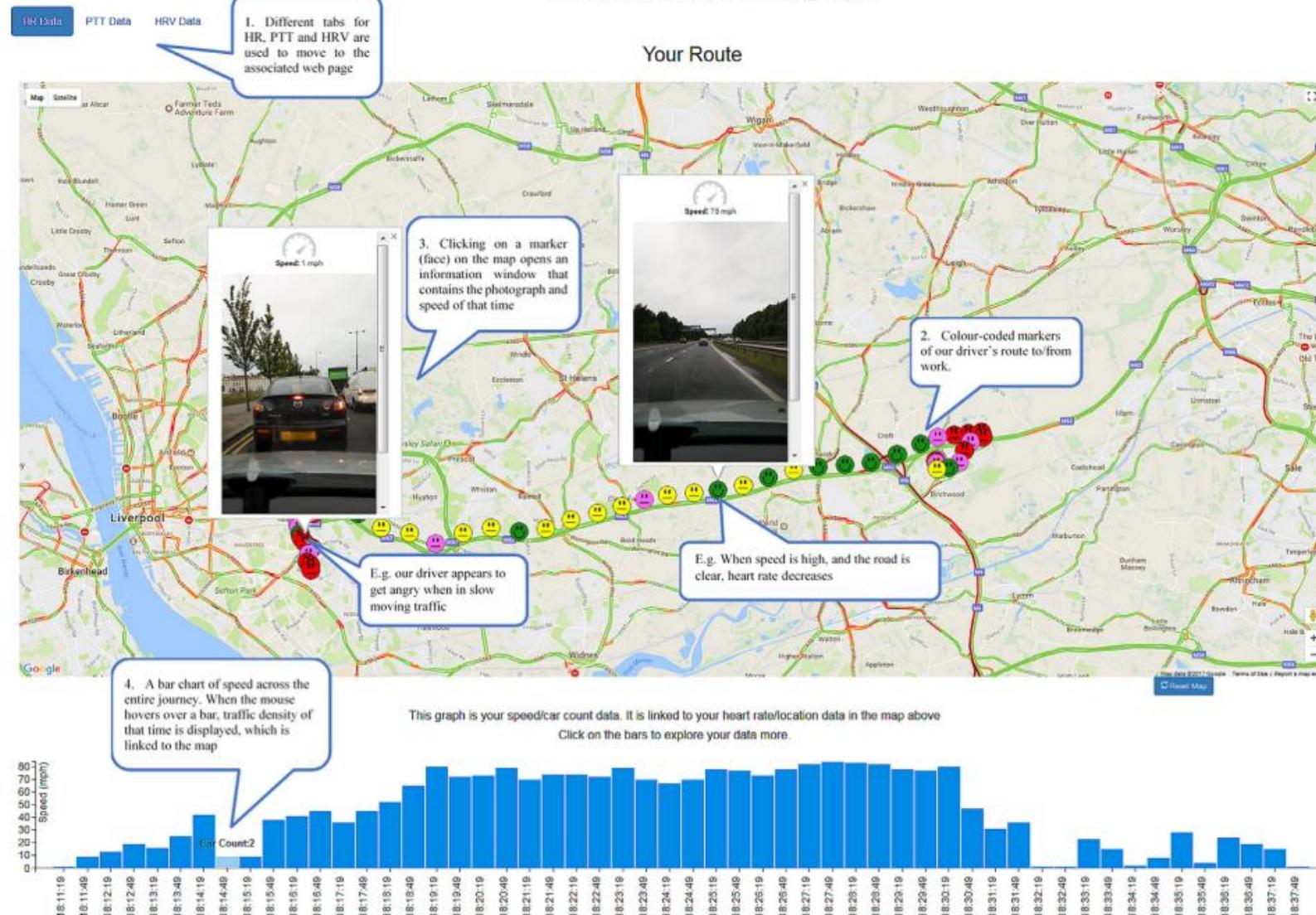


A screenshot of the MyLifeBits software interface. The main window shows a timeline from 9 AM to 3 PM on September 27, 2003. The timeline is filled with various thumbnail images and document previews. An annotation box is open over one of the thumbnails, containing the text: "Edit Annotation This was a soccer game on a really hot day. We were all there! 11/14/2003 2:59:27 PM". Below the timeline, a preview window shows a full-body photo of a person in a red shirt standing outdoors. The software interface includes a sidebar with classification and search tools, and a bottom navigation bar.



# Lifelogging





**Fig. 7.** Data visualization that links cardiovascular psychophysiology to an interactive map that is linked to location, photos, speed and traffic density.

# Cognition



## Cognitive Information Processing

Organisation

- Put information into a meaningful order

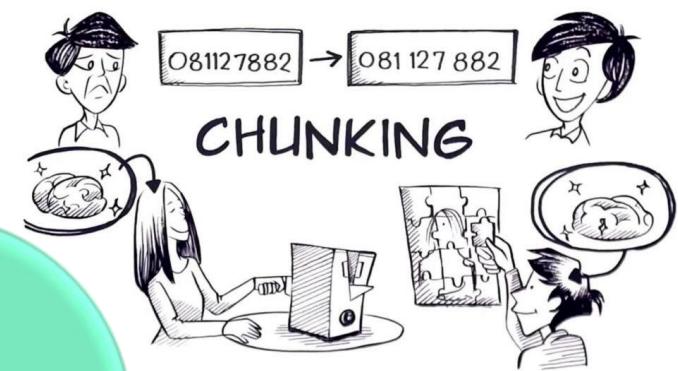
### Attention

- Mental process of selecting certain environmental information to focus on (cocktail party effect)



### Chunking

- Cognitive ability to group information together



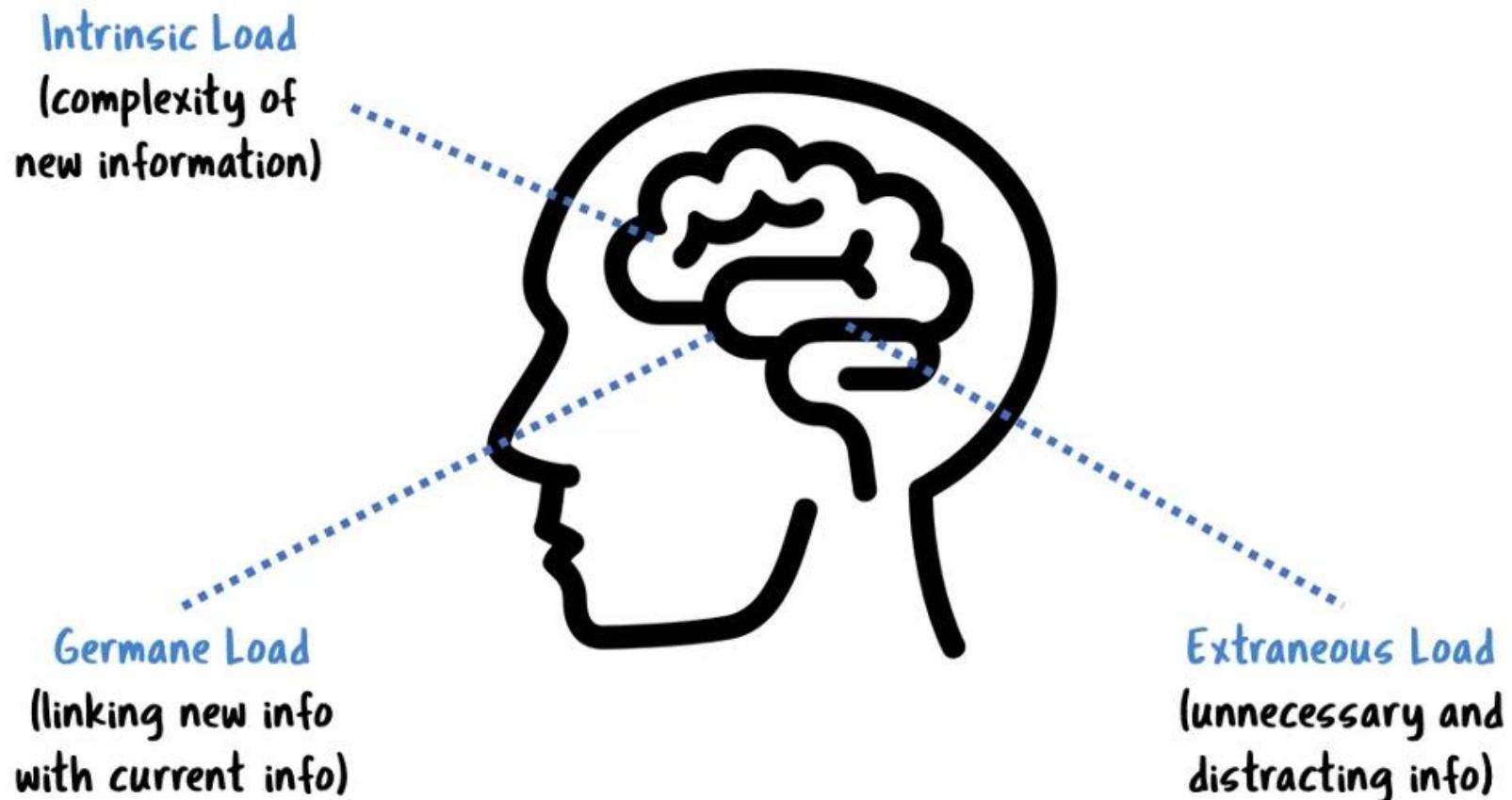
# Cognitive Overload

- A situation where you are given too much information at once (or too many simultaneous tasks) resulting in not being able to perform or process the information
- A feeling of being saturated and you can't take in any more information



# Cognitive Load Theory

## Cognitive Load Theory



# Implications for Design



Advances in computer technologies have improved people's multi-tasking performance but human attention is a finite resource<sup>1</sup>



An understanding of cognitive load greatly benefits designers/developers to gauge when and how to best communicate information<sup>1</sup>

<sup>1</sup> Haapalainen, E., Kim, S., Forlizzi, J.F., Dey, A.K., 2010. Psycho-Physiological Measures for Assessing Cognitive Load, in: *Proceedings of the 2010 ACM Conference on Ubiquitous Computing (UbiComp'10)*. ACM Press, New York, New York, USA, pp. 301–310.  
<https://doi.org/10.1145/1864349.1864395>

# Implications for Design

- Presenting information at the wrong time can drastically increase one's cognitive demands, can have negative impacts on task performance and emotional state, and in extreme cases, even be life threatening
- White space and borders are visual ways to group information to make it easier to locate and perceive items

Black Hills Forest  
Cheyenne River  
Social Science  
South San Jose  
Badlands Park  
Juvenile Justice

Peters Landing  
Public Health  
San Bernardino  
Moreno Valley  
Altamonte Springs  
Peach Tree City

Jefferson Farms  
Psychophysics  
Political Science  
Game Schedule  
South Addison  
Cherry Hills Village

Devlin Hall  
Positions  
Hubard Hall  
Fernadino Beach  
Council Bluffs  
Classical Lit

Webmaster  
Russian  
Athletics  
Go Shockers  
Degree Options  
Newsletter

Curriculum  
Emergency (EMS)  
Statistics  
Award Documents  
Language Center  
Future Shockers

Student Life  
Accountancy  
McKnight Center  
Council of Women  
Commute  
Small Business

Dance  
Gerontology  
Marketing  
College Bylaws  
Why Wichita?  
Tickets

# Implications for Design

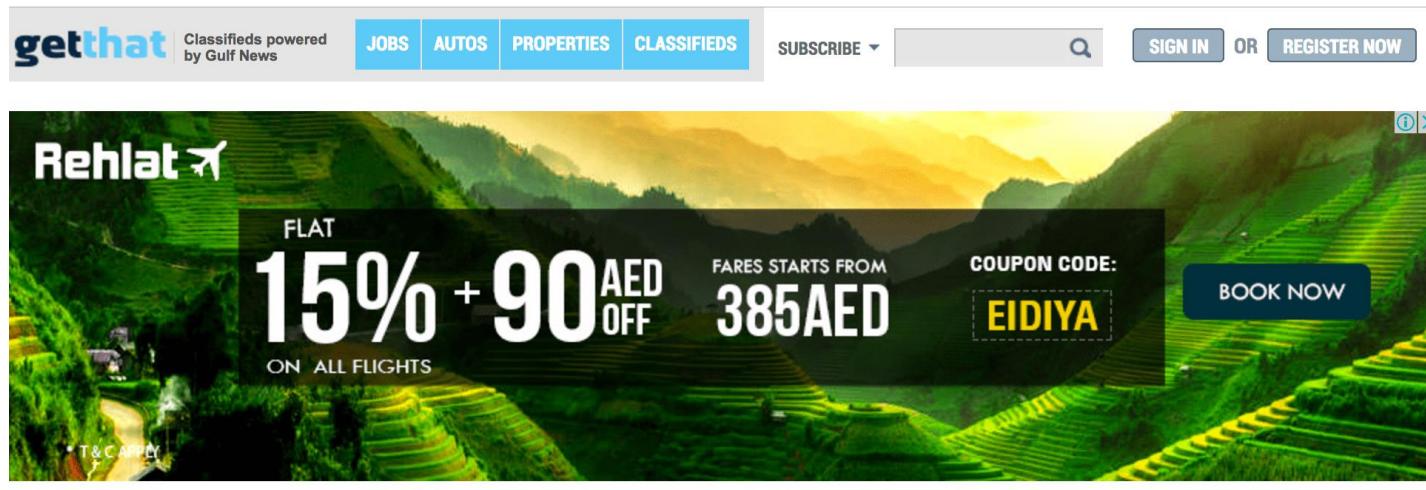
## South Carolina

City	Motel/Hotel	Area code	Phone	Rates	
				Single	Double
Charleston	Best Western	803	747-0961	\$26	\$30
Charleston	Days Inn	803	881-1000	\$18	\$24
Charleston	Holiday Inn N	803	744-1621	\$36	\$46
Charleston	Holiday Inn SW	803	556-7100	\$33	\$47
Charleston	Howard Johnsons	803	524-4148	\$31	\$36
Charleston	Ramada Inn	803	774-8281	\$33	\$40
Charleston	Sheraton Inn	803	744-2401	\$34	\$42
Columbia	Best Western	803	796-9400	\$29	\$34
Columbia	Carolina Inn	803	799-8200	\$42	\$48
Columbia	Days Inn	803	736-0000	\$23	\$27
Columbia	Holiday Inn NW	803	794-9440	\$32	\$39
Columbia	Howard Johnsons	803	772-7200	\$25	\$27
Columbia	Quality Inn	803	772-0270	\$34	\$41
Columbia	Ramada Inn	803	796-2700	\$36	\$44
Columbia	Vagabond Inn	803	796-6240	\$27	\$30

## Pennsylvania

Bedford Motel/Hotel: Crinaline Courts (814) 623-9511 S: \$18 D: \$20
Bedford Motel/Hotel: Holiday Inn (814) 623-9006 S: \$29 D: \$36
Bedford Motel/Hotel: Midway (814) 623-8107 S: \$21 D: \$26
Bedford Motel/Hotel: Penn Manor (814) 623-8177 S: \$19 D: \$25
Bedford Motel/Hotel: Quality Inn (814) 623-5189 S: \$23 D: \$28
Bedford Motel/Hotel: Terrace (814) 623-5111 S: \$22 D: \$24
Bradley Motel/Hotel: De Soto (814) 362-3567 S: \$20 D: \$24
Bradley Motel/Hotel: Holiday House (814) 362-4511 S: \$22 D: \$25
Bradley Motel/Hotel: Holiday Inn (814) 362-4501 S: \$32 D: \$40
Breezewood Motel/Hotel: Best Western Plaza (814) 735-4352 S: \$20 D: \$27
Breezewood Motel/Hotel: Motel 70 (814) 735-4385 S: \$16 D: \$18

# Implications for Design



1

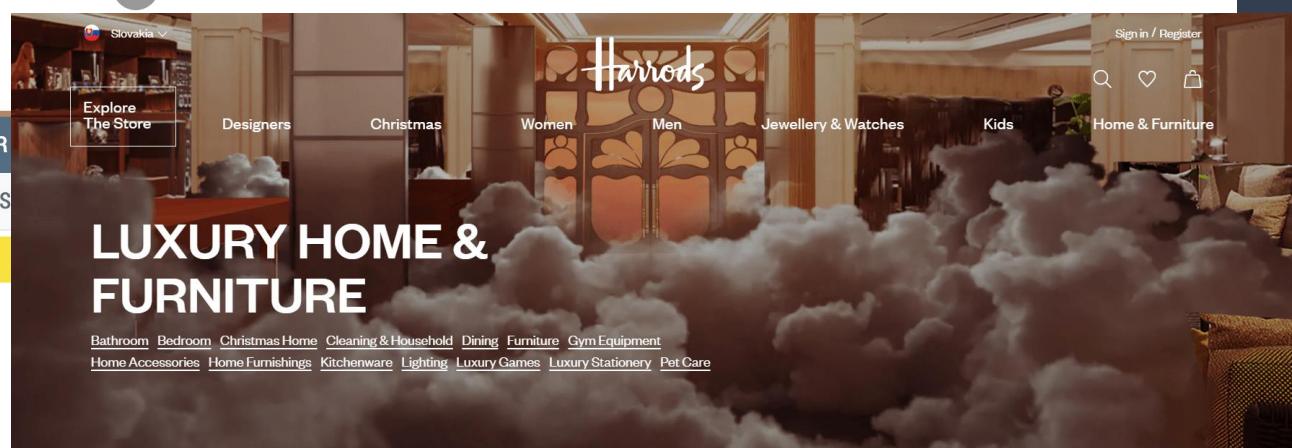
Which one reduces  
the cognitive load?

August 25, 2017 | Last updated 19 minutes ago

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38

# Learning/Training

<https://www.youtube.com/watch?v=KAlJ1AuGFDg>



<https://www.youtube.com/watch?v=bqra7wslwCM>

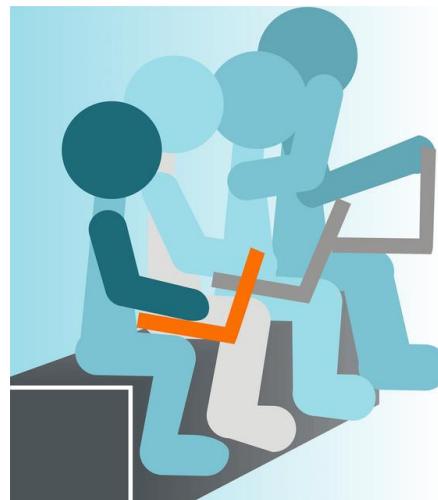


# Learning/Training



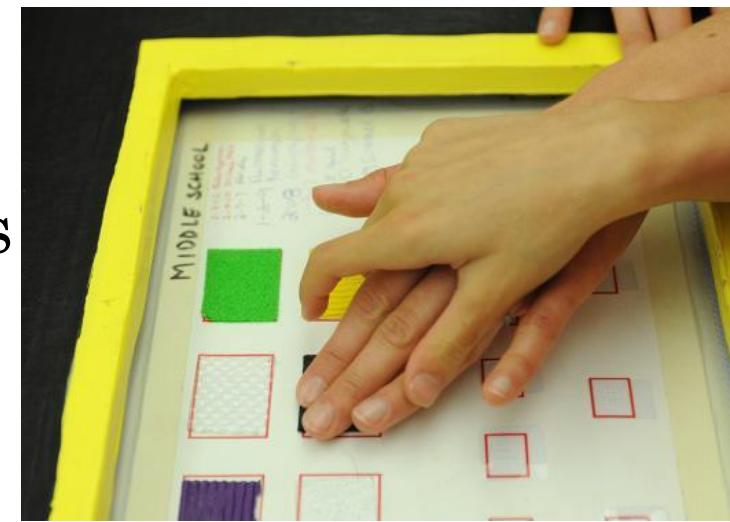
# Learning

- Design implications for learning include:
  - Interfaces should encourage exploration
  - Whilst also constraining and guiding users to select appropriate actions when they are initially learning
  - Particular representations and abstract concepts should be dynamically linked to allow the learning of complex material



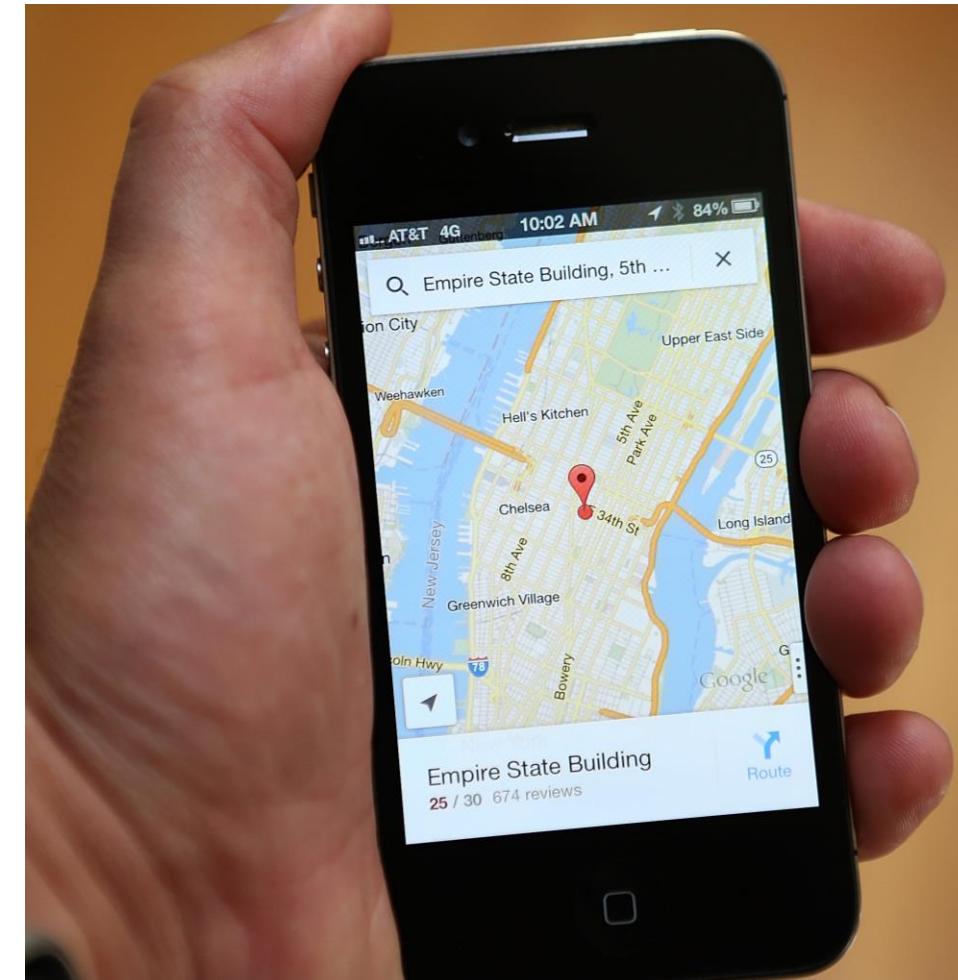
# Reading, Speaking and Listening

- The easiness that people can read, listen, or speak is different and depends on the person, task, and context
- Technology can support this through:
  - Interactive books and web-based materials
  - Speech-recognition systems
  - Speech-output systems
  - Auditory navigation and tactile diagrams



# Problem Solving and Decision Making

- Design implications include:
  - Provide additional hidden information that is easily accessible for those who want to go deeper
  - Simple and memorable functions on the interface can support rapid decision making and planning that takes place while on the move



# Cognitive Diversity

- Designing for cognitive diversity is the foundation for the future of work, regardless of industry
- As technology expands, we must consider what it means to create experiences that adapt to people and context, and create along the emotional and functional spectrum
  - What kind and what level of cognitive demands do our experiences place on our users?
  - Are there some types of cognitive demands that are especially heavy, and if so do we support different needs around capabilities like focus and attention?
  - Do we support many ways for people to be at their best, or just the ones that mirror our own needs?



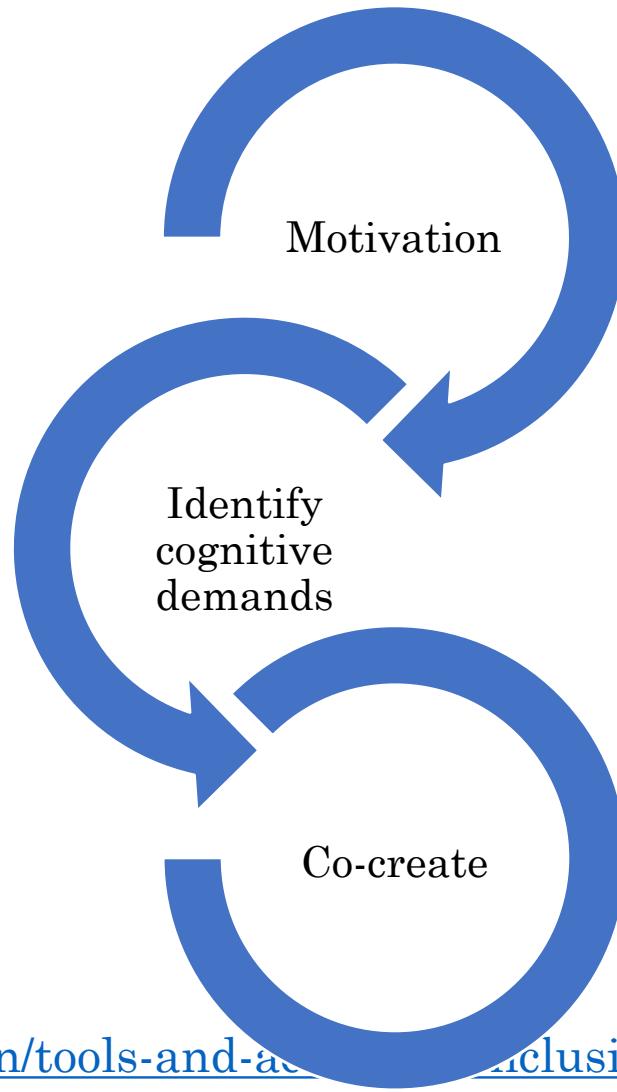
# Cognitive Exclusion

- Despite good intentions, cognitive exclusion results from poor understanding of science or broad assumptions about people with certain medical conditions
  - System creators shouldn't attempt to diagnose medical conditions
- Addressing cognition has huge potential for innovation in every industry
- A critical step in moving beyond an era of technology that forced people to adapt to products—and **toward a future where technology adapts to people**

# Inclusive Design

*“It’s not about making technology more human-like. It’s about designing technology to embrace the things that make us human” Microsoft Inclusive Design for Cognition Guidebook*

# Cognitive Exclusion Guidelines



- For any task to be successful, motivation must equal or surpass cognitive load
- With cognitive diversity in mind

# Motivation

- Human motivation not features
- Avoid a collection of disconnected features with no link between tasks, goals, and motivations
- Components should support the same set of higher-level goals and motivations for the entire experience to feel coherent and in service to your needs
- When they aren't aligned, tasks can seem like pointless distractions from true motivations



# Cognitive Demands

## Learning

- What does it take to learn something new?

## Focus

- Does the experience consider the cost of interruption and enable collaboration and task completion?
- What do people do to adjust between different levels of focus?
- What is the role of distractions and what methods do people use to filter them out?

## Decision-making

- Are the most critical factors and consequences clear for all choices?
- If there are many small decisions, is it clear what they build to?

## Recall

- What can technology learn from how people create systems for placing, remembering, and finding what they need?
- Does a task require people to retain large amounts of information, and if so, what tools enable recall?

## Communication

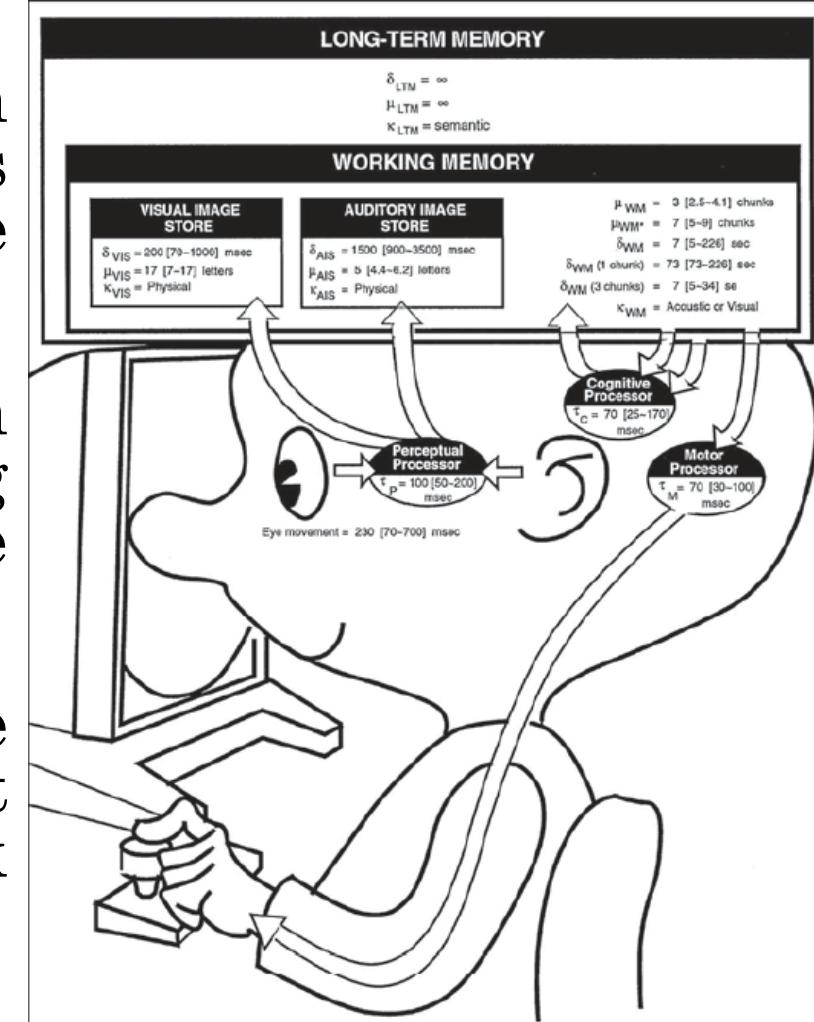
- How can technology understand and adapt to a person's communication preferences?

# Co-Create

- Include people who share similar motivations to co-create solutions
- Consider situational context
- Be inspired by human interactions – it's always a choice to let either people or technology lead an interaction
- Designing technology means teaching it how to behave appropriately as it interacts with people and requires us to understand people

# Model Human Processor (MHP)

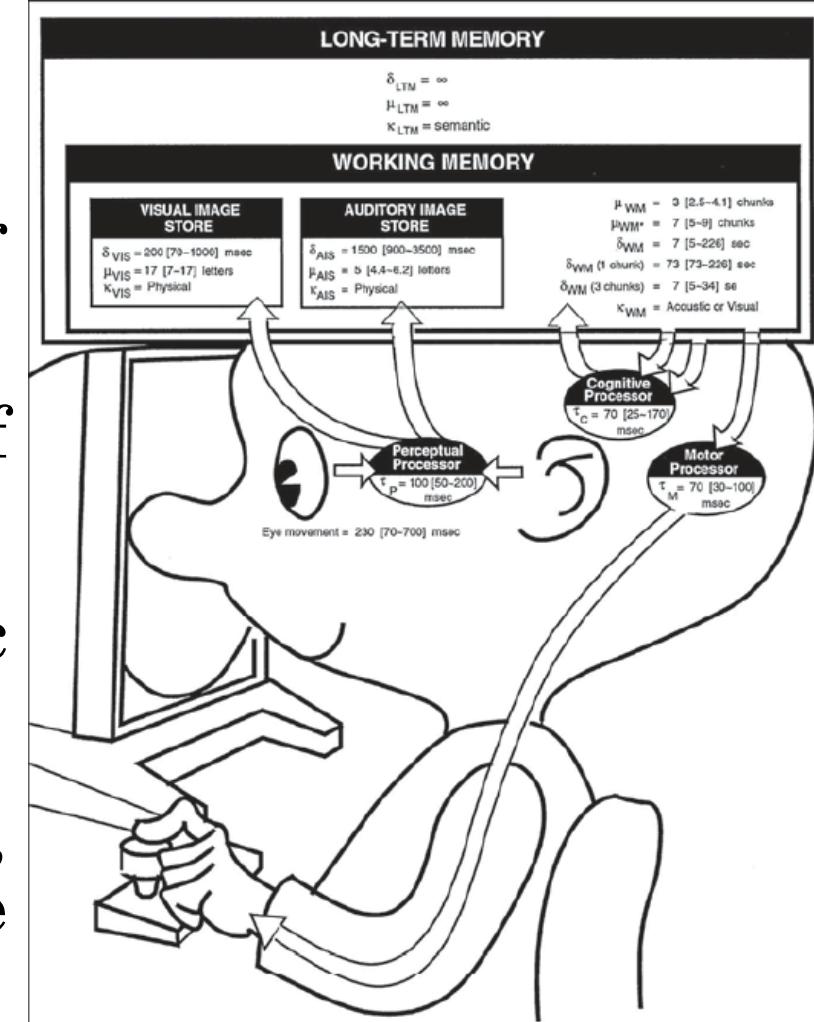
- Cognitive modelling method and design tool used to calculate how long it takes to perform a certain task to create effective user interfaces
- Cognitive modelling methods can evaluate the usability of a system using experimental times to calculate cognitive and motor processing time.
- Allows a system designer to predict the performance with respect to time it takes a person to complete a task without performing experiments



Card, S.K; Moran, T. P; and Newell, A. *The Model Human Processor: An Engineering Model of Human Performance*. In K. R. Boff, L. Kaufman, & J. P. Thomas (Eds.), *Handbook of Perception and Human Performance*. Vol. 2: Cognitive Processes and Performance, 1986, pages 1–35

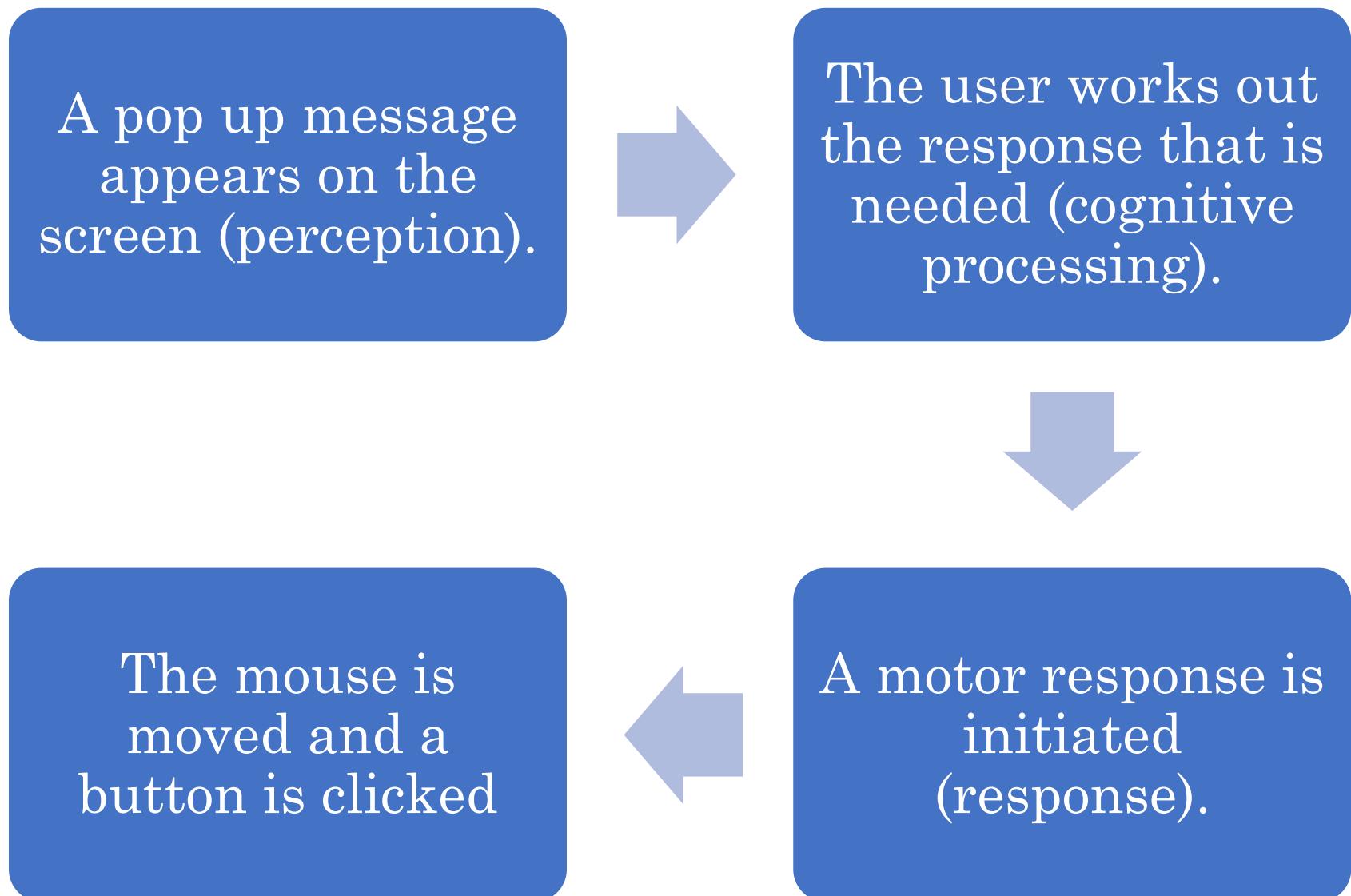
# Model Human Processor (MHP)

- Supports recognition rather than recall
- Reduces the load on short term (or working) memory
- Supports the production of chunks of items to facilitate memory
- Frequent activities become automatic and do not require conscious attention
- For highly practised responses, requiring a confirmation of the response will not necessarily reduce errors



Card, S.K; Moran, T. P; and Newell, A. *The Model Human Processor: An Engineering Model of Human Performance*. In K. R. Boff, L. Kaufman, & J. P. Thomas (Eds.), *Handbook of Perception and Human Performance*. Vol. 2: Cognitive Processes and Performance, 1986, pages 1–35

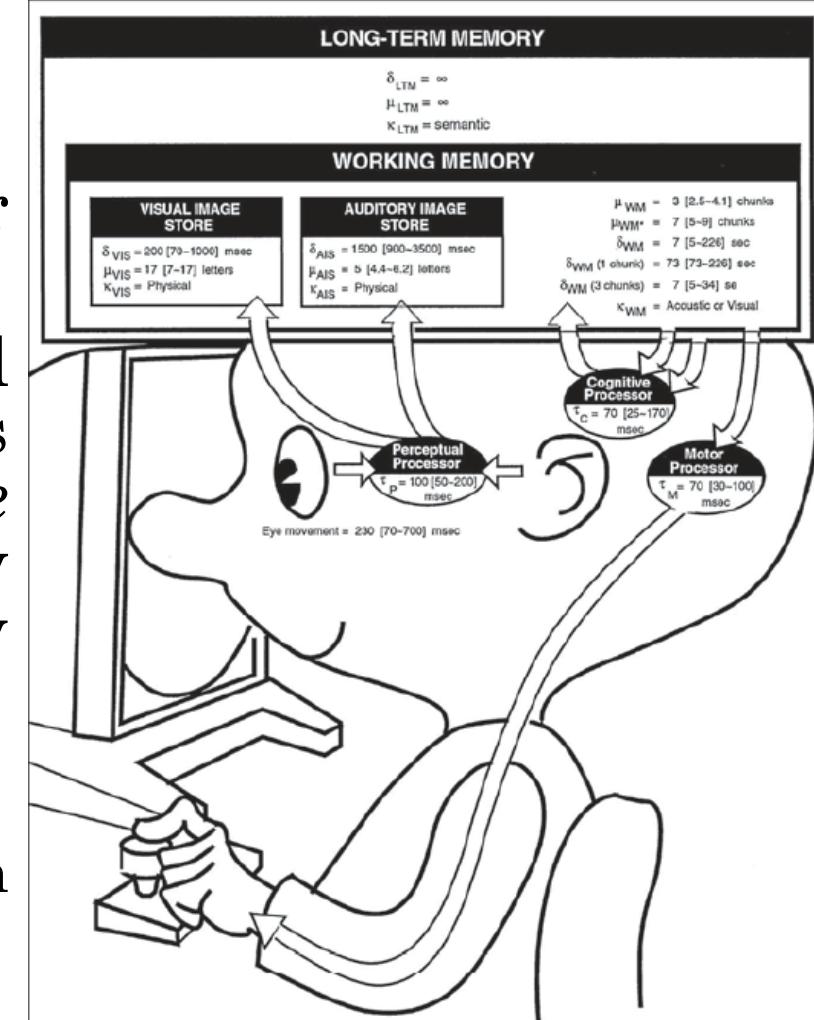
# Model Human Processor (MHP)



# Model Human Processor (MHP)

- **Perceptual Processor**

- Consists of sensors and associated buffer memories
- Takes input from the eyes and ears and drops it into two temporary memories (*Visual Image Store* and *Auditory Image Store*) to hold the output of the sensory system while it is being symbolically coded
- A visual or audible stimulus appears
  - A pop up message appears on the screen (perception)

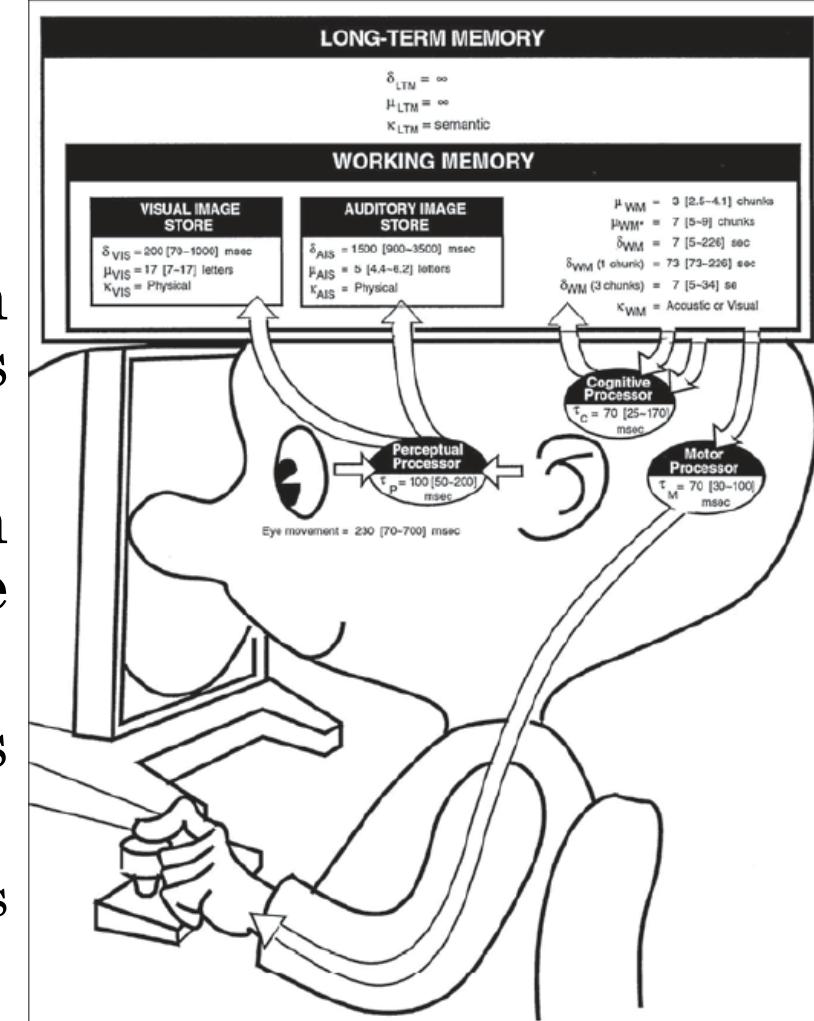


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# Model Human Processor (MHP)

- **Cognitive Processor**

- Operates on data from all the memories
- Receives symbolically coded information from the sensory image store in its *Working memory*
- Uses previously stored information stored in *Long term memory* to make decision about how to respond
- The physical attributes of the stimulus are decoded
  - The user works out the response that is needed (cognitive processing)

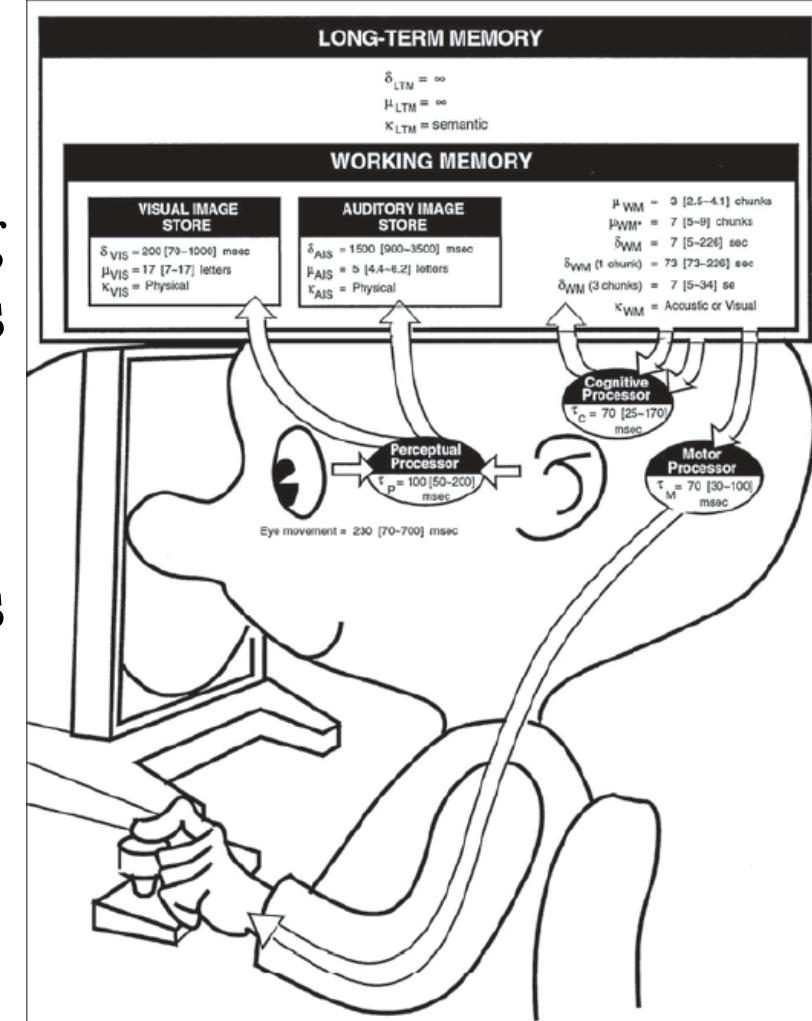


Card, S.K; Moran, T. P; and Newell, A. *The Model Human Processor: An Engineering Model of Human Performance*. In K. R. Boff, L. Kaufman, & J. P. Thomas (Eds.), *Handbook of Perception and Human Performance*. Vol. 2: Cognitive Processes and Performance, 1986, pages 1–35

# Model Human Processor (MHP)

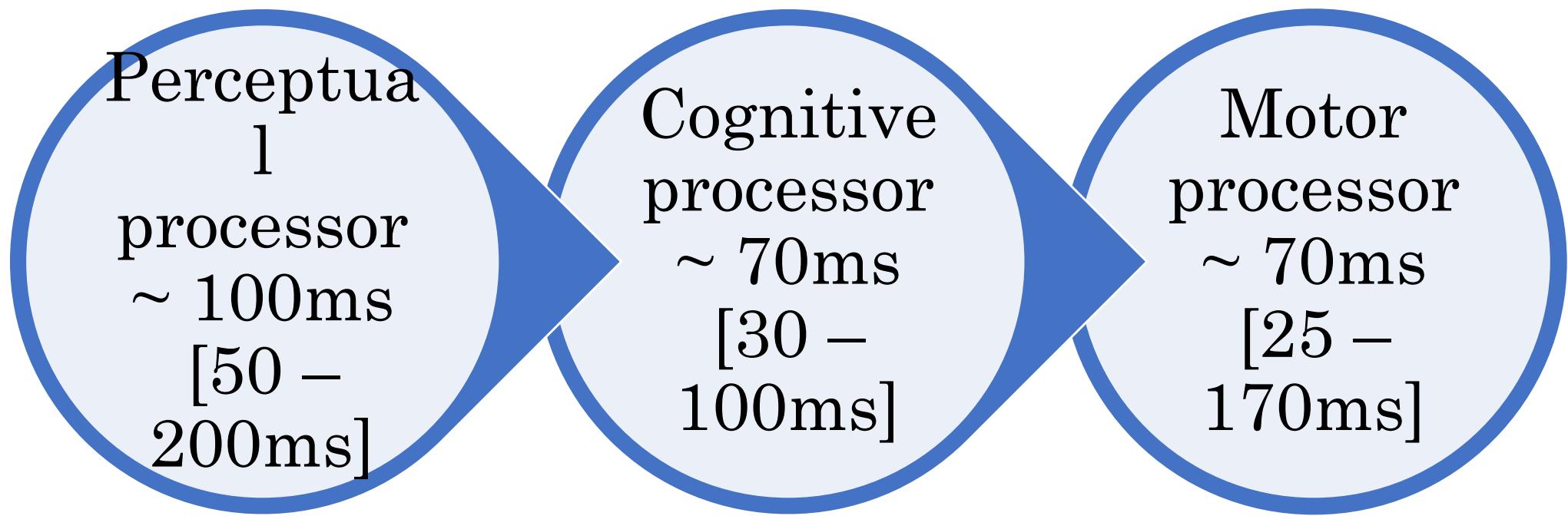
- **Motor Processor**

- Takes instructions from the working memory and runs those instructions on the muscles
- Carries out the specified response
- The mouse is moved and a button is clicked

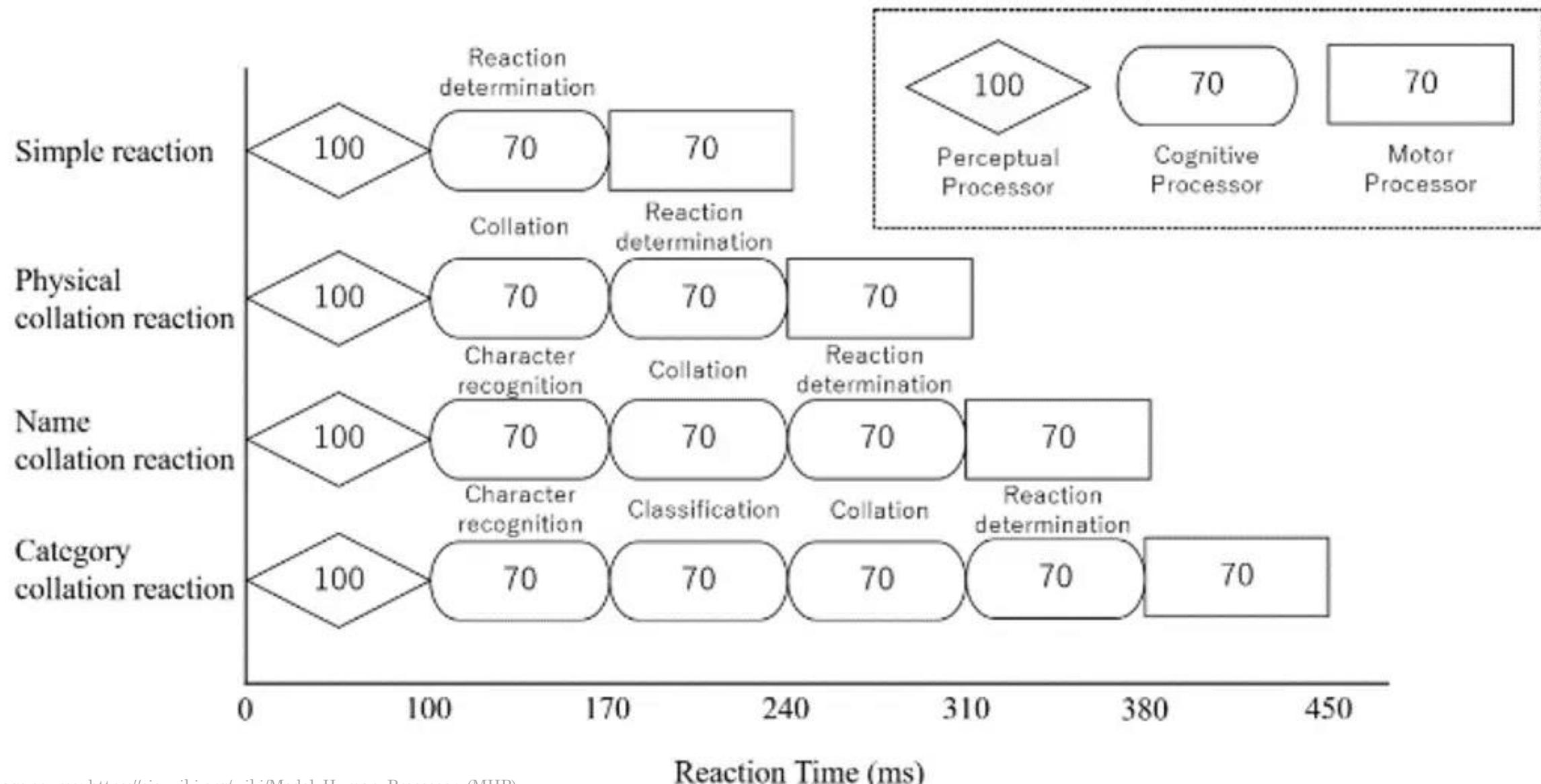


Card, S.K; Moran, T. P; and Newell, A. *The Model Human Processor: An Engineering Model of Human Performance*. In K. R. Boff, L. Kaufman, & J. P. Thomas (Eds.), *Handbook of Perception and Human Performance*. Vol. 2: Cognitive Processes and Performance, 1986, pages 1–35

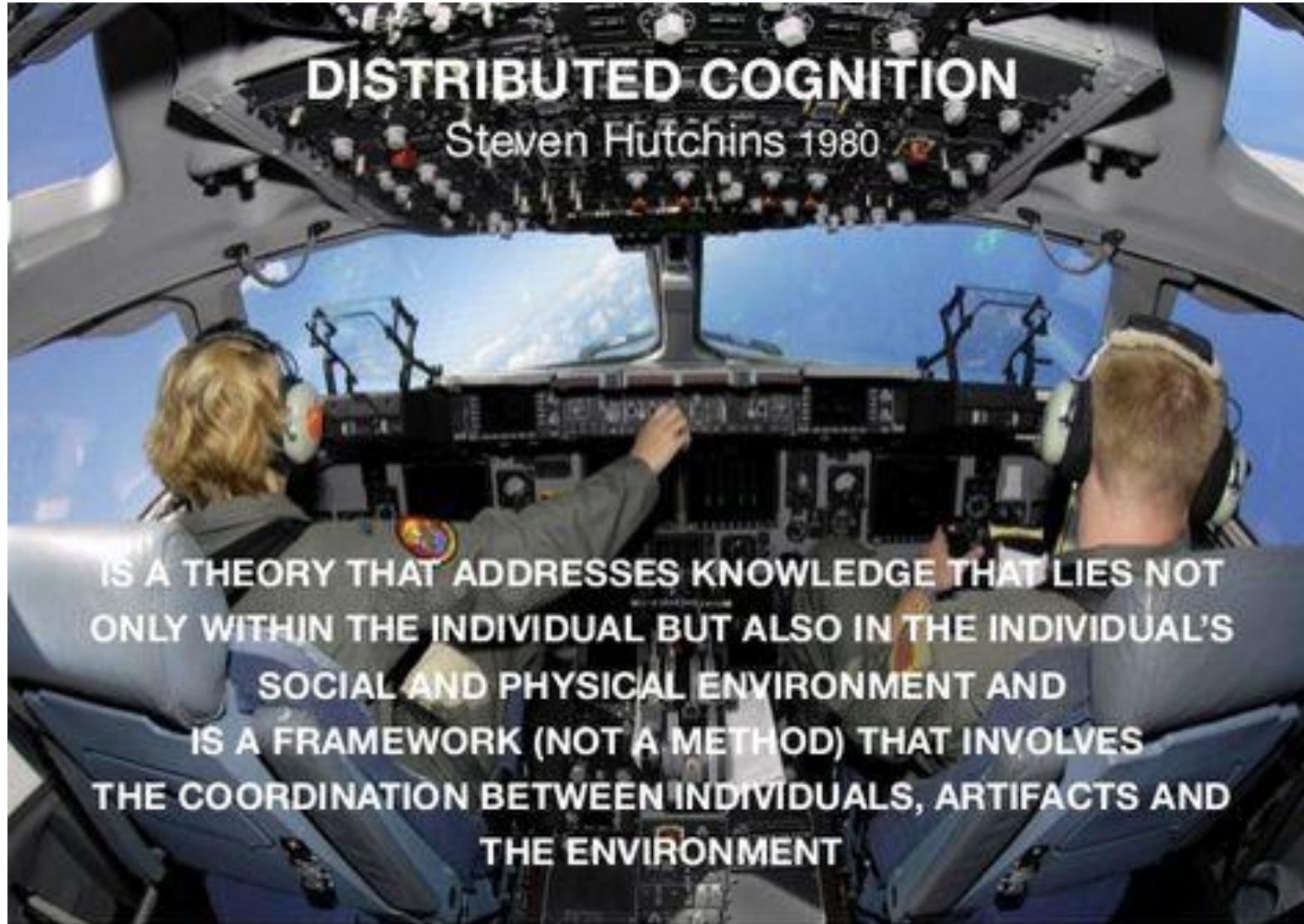
# Processors in the MHP



# Reaction Times

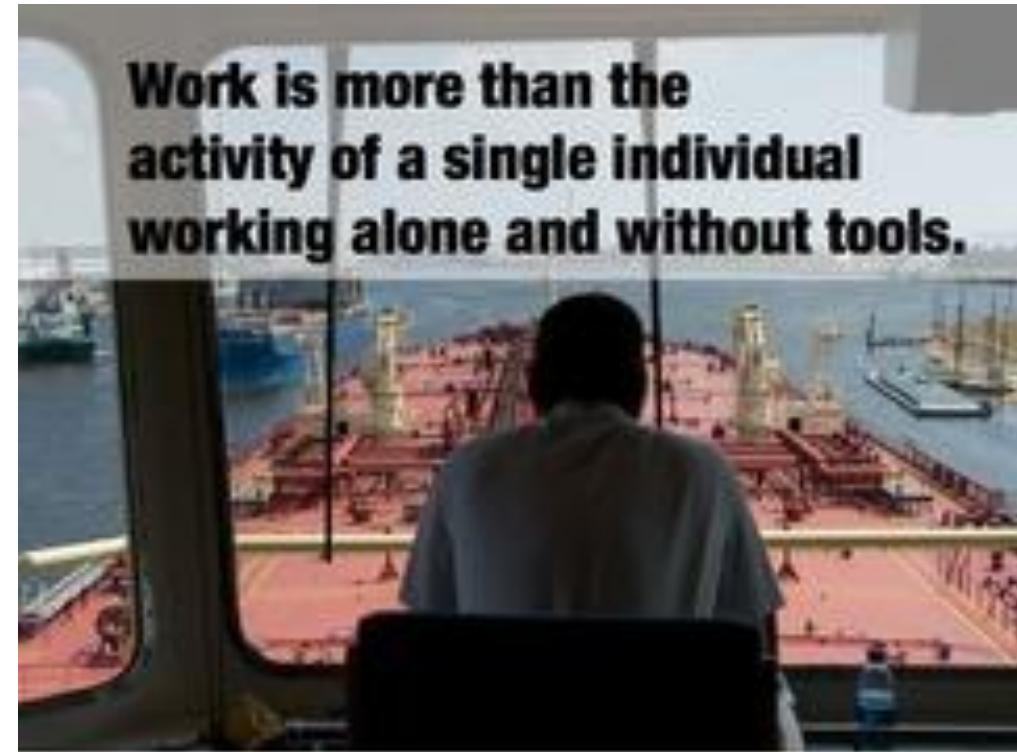


# Distributed Cognition

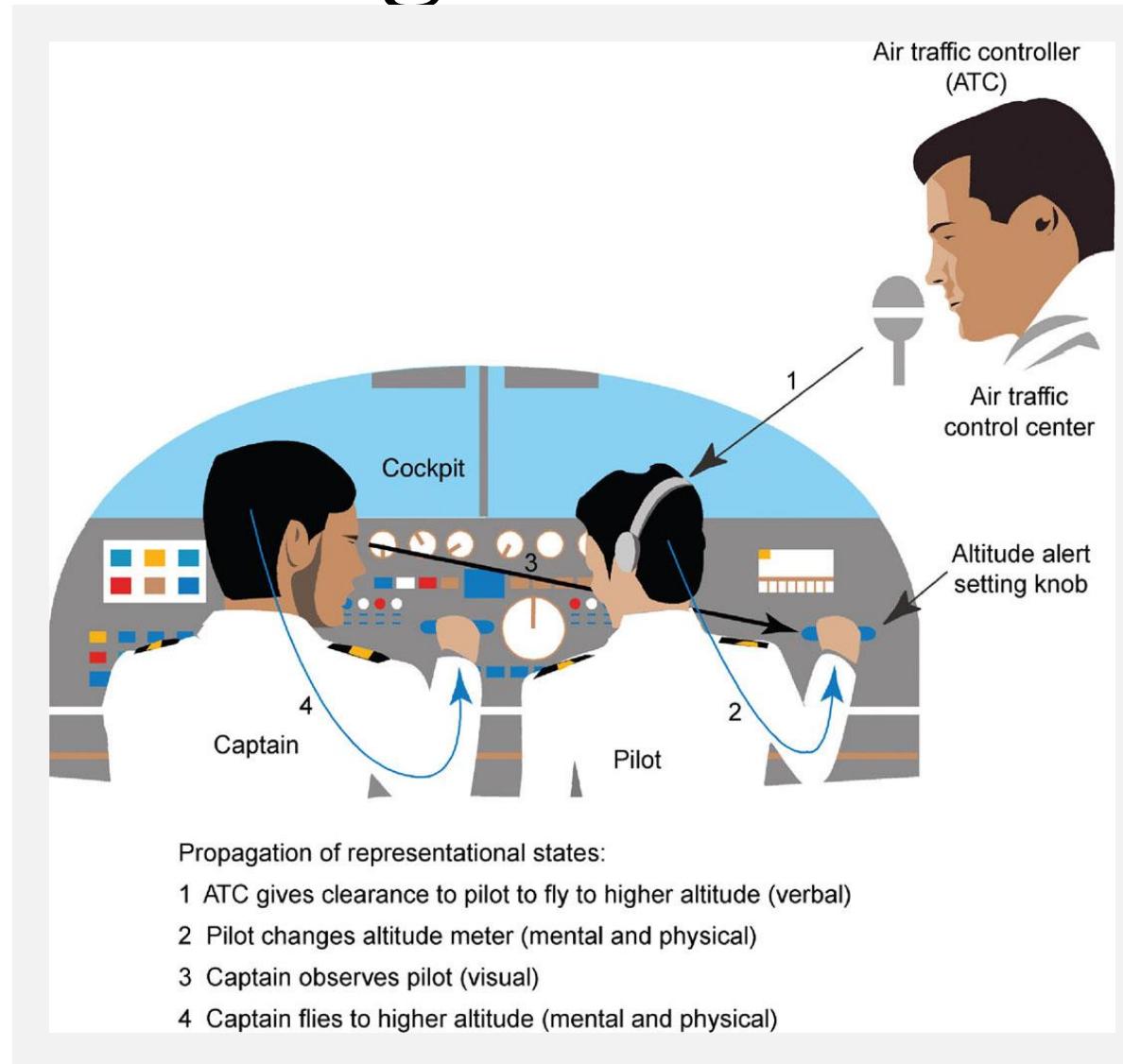


# Distributed Cognition

- A process in which cognitive resources are shared socially in order to extend individual cognitive resources or to accomplish something that an individual agent could not achieve alone. (Lehtinen et al., 1999).
- Describes how cognitive phenomena works across individuals, artefacts, and internal and external representations (Hutchins, 1995)
- Provides an effective conceptual framework for understanding human-computer interaction
- Enables us to understand what humans can achieve and how artefacts, tools, and socio-technical environments can be designed and evaluated to empower humans beings and to change tasks (Fischer, 2003)



# Distributed Cognition



# Persuasive Design

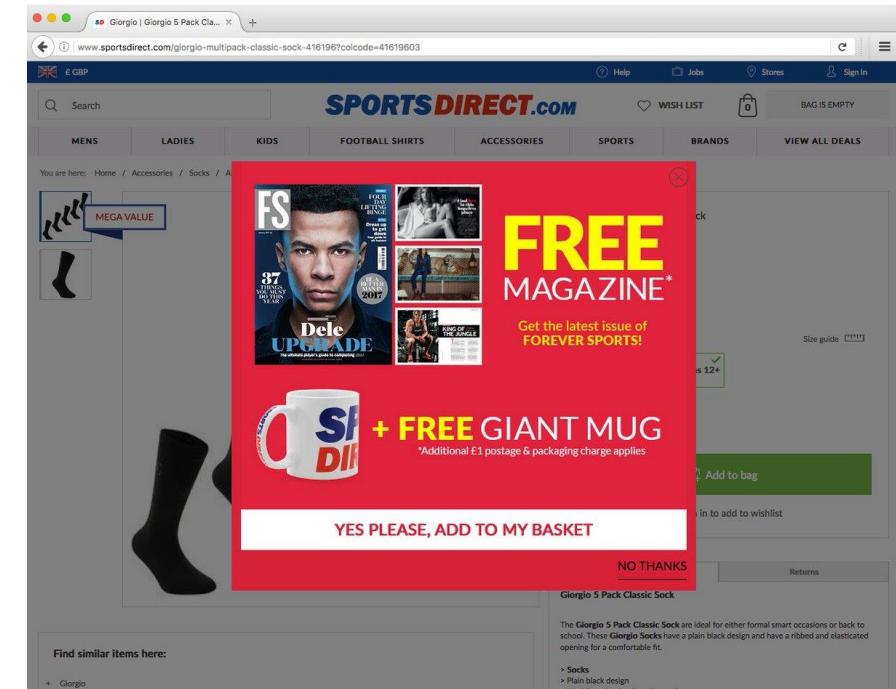
- Human behaviour is influenced through the characteristics of a product or service
- The design of an interface can persuade and even change a users' attitudes and behaviours
- Persuasive technology can be used to purposefully apply psychological principles of persuasion into interactive media, in the hope of changing users' attitudes and behaviour
  - E-Commerce
  - Motivating health behaviour
  - Video games
  - Public transport



perCues prototype for mobile devices to persuade people to use public mass transport

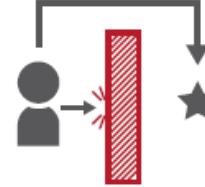
# Nudging and Dark Patterns

- Dark patterns are deceptive aspects of an interface that have been designed carefully in order to deliberately trick people
  - E.g. signing up for email alerts
  - Smaller text, different colours, etc.
- Dark patterns often go undetected by the average person as they play upon cognitive biases that we all have without realizing it
- Nudging describes how users can be led toward making certain choices by appealing to psychological biases
  - E.g. smaller short-term rewards over long-term gains
- Often a website's design nudges users towards a specific option (usually the more expensive) and distracts them from other options (e.g. standard)



@darkpatterns

# Nudging and Dark Patterns

 <b>NAGGING</b> Redirection of expected functionality that persists beyond one or more interactions.	 <b>OBSTRUCTION</b> Making a process more difficult than it needs to be, with the intent of dissuading certain action(s).	 <b>SNEAKING</b> Attempting to hide, disguise, or delay the divulging of information that is relevant to the user.	 <b>INTERFACE INTERFERENCE</b> Manipulation of the user interface that privileges certain actions over others.	 <b>FORCED ACTION</b> Requiring the user to perform a certain action to access (or continue to access) certain functionality.
<b>INCLUDES:</b> Brignull "Roach Motel," "Price Comparison Prevention," and "Intermediate Currency"	<b>INCLUDES:</b> Brignull "Forced Continuity," "Hidden Costs," "Sneak into Basket," and "Bait and Switch"		<b>INCLUDES:</b> Hidden Information, Preselection, Aesthetic Manipulation, Toying with Emotion, False Hierarchy, Brignull "Disguised Ad," and "Trick Questions"	<b>INCLUDES:</b> Social Pyramid, Brignull "Privacy Zuckering," and Gamification

**Figure 1. Summary of dark pattern strategies derived from analysis of our corpus.**

# Nudging and Dark Patterns

The screenshot shows a mobile application interface for Delta Airlines. At the top, the Delta logo is visible along with a "Menu" button featuring a three-line icon. Below the menu is a red Delta wing icon.

**ENHANCE YOUR EXPERIENCE**  
Make your trip as comfortable as possible

**FIRST CLASS**  
Available for: PHX ▶ SEA      169.00 USD  
per passenger

**DELTA COMFORT+™**  
Available for: PHX ▶ SEA      49.00 USD  
per passenger

**TOTAL**  
for all passengers (1)      \$169.00 USD

Purchase summary will be available at the end of check-in as a receipt for this charge

**NO THANKS, CONTINUE CHECKING IN**

**PAY FOR SELECTION NOW**

**NEED HELP? CONTACT US >**

# Nudging and Dark Patterns

Name on card:

Card number:

Expiry date:

CVC:

**START FREE TRIAL**

Free 14 days trial. Your account will be renewed automatically after your trial. You can cancel your subscription at any time.

Items	Size	Quantity	Price
Purple T-Shirt	S	1	€20
Black Dress	S	1	€30
<input checked="" type="checkbox"/> Yes, I want express delivery. Delivery fee: €5. Your order will arrive within 2 business days.			
		Total	€55
<b>✓ Proceed to Checkout</b>			

I would like to receive your company's promotional materials in the future.

**CHECK OUT**

Account Setup

1 2 3 4 5

	Adam	Adam@notarealemail.net
	Amy	amy.amy@notarealemail.net
	David	david.m@fakeemail.net
	Helen	helen.k@dummyemail.com

Invite all your phone contacts to use this app?

**NEXT**

**SIGN UP TO OUR NEWSLETTER TO GET 10% OFF**

NAME

EMAIL

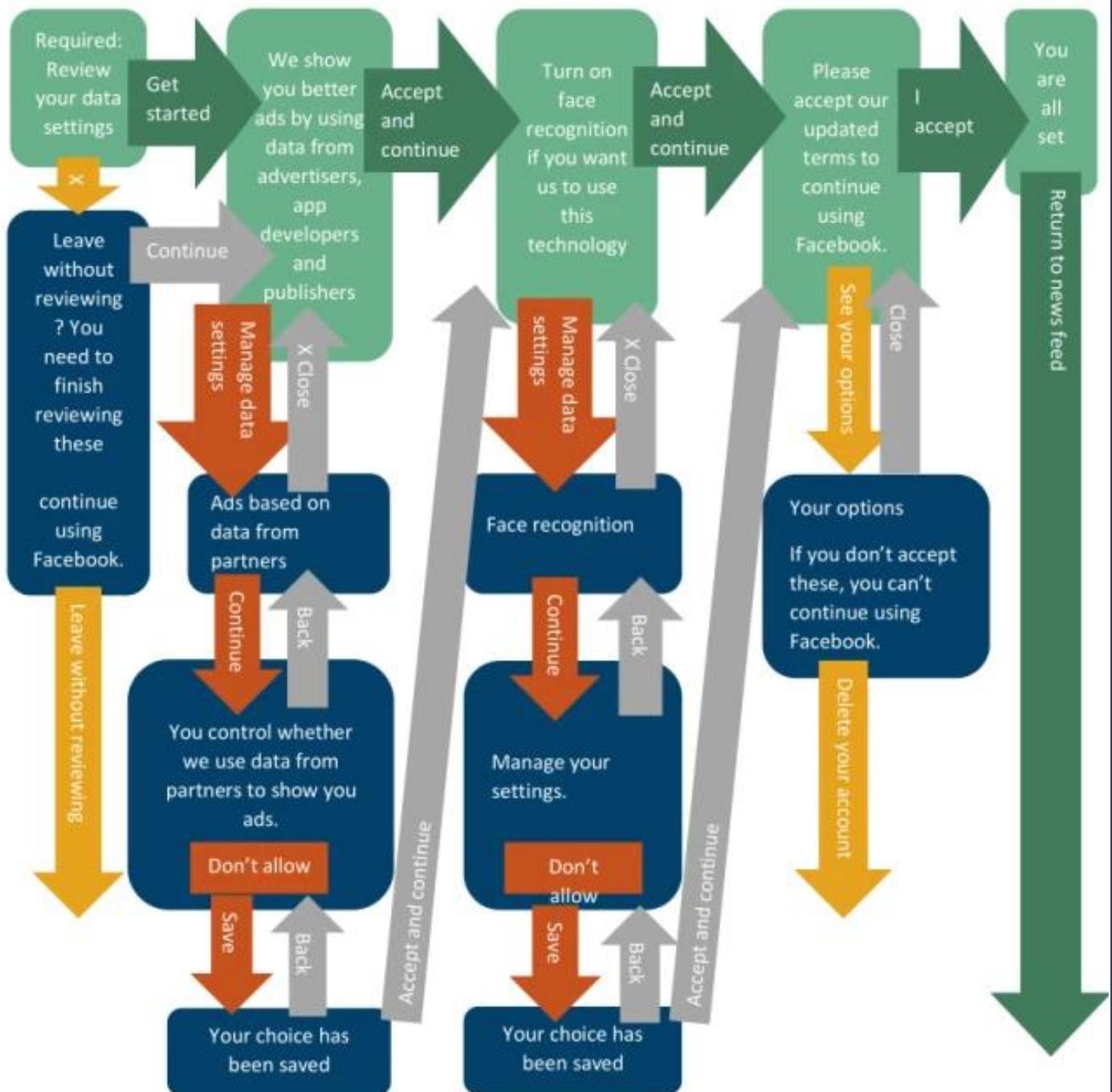
**SIGN UP**

[No, thanks.](#)

# Nudging and Dark Patterns

- 2018 report found companies used default settings and dark patterns, techniques, and features of interface design to manipulate and nudge users towards intrusive privacy options

	Facebook	Google	Windows
No privacy intrusive default settings in popups	✗	✗	✓
Equal ease (number of clicks) for privacy friendly options in popups	✗	✗	✓
Design (colours and symbols) does not lead toward privacy intrusive option in popups	✗	✗	✗
Language does not lead toward privacy intrusive option in popups	✗	✗	✗
Privacy friendly options in popups come without “warnings”	✗	✗	✓
Users can clearly postpone the decision while accessing the service in the meantime	✗	✗	✗



Facebook's privacy options process:

Green = “easy” route

Orange = extra clicks to manage settings

Yellow = delete account routes

Grey = route back to main green route

Blue = extra screens when not choosing to accept

# When Dark Patterns Go Wrong

- Epic Games will pay a total of \$520m in penalties and refunds for using "dark patterns" to trick players into making unwanted or unauthorized charges
- The Federal Trade Commission (FTC) made the following points about the investigation:
  - "Epic used *privacy-invasive default settings* and *deceptive interfaces* that tricked Fortnite users, including teenagers and children,"
  - "Fortnite's counterintuitive, inconsistent, and confusing button configuration led players to incur unwanted charges based on the press of a single button"
  - "Players could, for example, be charged while trying to wake the game from sleep mode, while the game was in a loading screen, or by pressing a nearby button when simply trying to preview an item"
  - "These tactics led to hundreds of millions of dollars in unauthorized charges for consumers"

Fortnite video game maker to pay \$520m over privacy and billing claims

Epic Games agrees with FTC to pay \$275m fine for collecting data on children and refund customers \$245m for deceptive practices



The FTC said 'Fortnite's counterintuitive, inconsistent, and confusing button configuration led players to incur unwanted charges'. Photograph: Chris Delmas/AFP/Getty Images

The video game company Epic Games will pay a total of \$520m in penalties and refunds to settle complaints involving children's privacy and methods that tricked players into making purchases, US federal regulators said on Monday.

The Federal Trade Commission (FTC) said that it had secured the record-breaking settlements for two cases from Epic Games, which makes the popular game Fortnite.

"Epic used privacy-invasive default settings and deceptive interfaces that tricked Fortnite users, including teenagers and children," the FTC chair, Lina Khan, said in a statement.

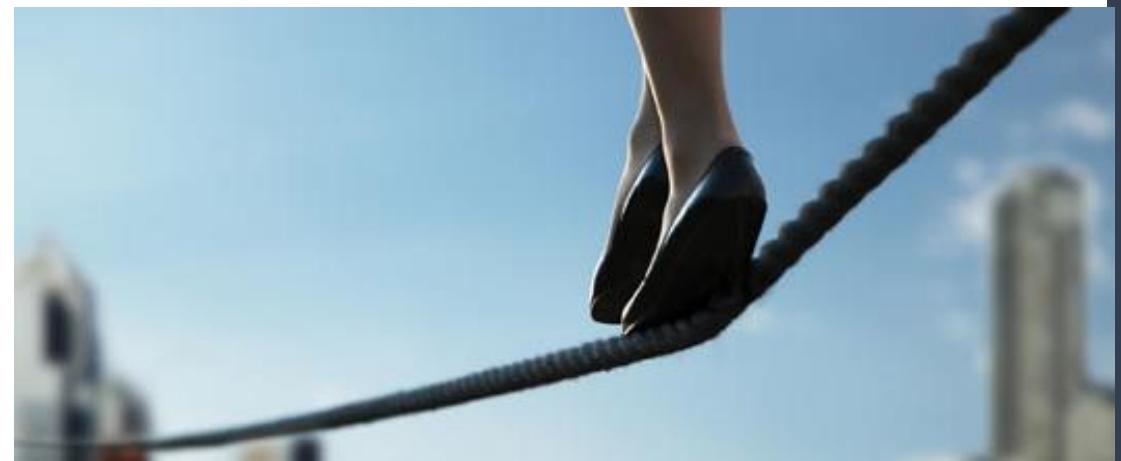
# Are Dark Patterns Illegal?

- The use of dark patterns is not by default illegal
  - It depends how the dark pattern is applied
- Online businesses need to be persuasive to consumers (to a degree), but dark patterns risk breaching both data protection and consumer laws and so should be used with caution
- *“More than eight in 10 Australians (83%) have lost money, lost control of their data or have been manipulated by a business to make a choice that isn’t in their interest”* [Consumer Policy Research Centre \(CPRC\)](#)
- In Australia some dark patterns may be in breach of consumer protections, including ([choice.com.au](#)):
  - Misleading or deceptive conduct if businesses create a misleading or deceptive impression about their product or service
  - Unfair contract terms where there is limited opportunity to negotiate with a business and where a term may pose significant imbalance or detriment, or where there is a lack of transparency
  - Patterns that breach privacy protections under the Privacy Act 1988 to protect the privacy of personal information.



# Is Persuasive Design Ethical?

- Persuasion is unethical if it relies on *deception*
- The majority of persuasive design is in the grey zone
- Designers have a responsibility to select and apply ethically-grounded strategies in their practice
- There is a fine line between influencing behaviour and tricking people



# Postgrads ONLY - DECO7250



Individual HCI Annotated  
Bibliography coursework spec is up  
on Blackboard

Read the brief

You will need to think about  
choosing **ten** papers that have  
been sourced from **at least four**  
different sessions from the  
[Proceedings of the 2022 CHI  
Conference on Human Factors in  
Computing Systems](#)

# Summary

- Cognition involves several processes, including memory, perception and learning
- The way an interface is designed can greatly affect how well users can perceive, attend, learn and remember how to do their tasks
- Theoretical frameworks provide ways of understanding how and why people interact with products
- Cognition is distributed among individuals, the environment, and various artefacts
- When designing for new technology it is important to determine its acceptance as new interaction contexts are emerging, which open new challenges to the user (cognitive limitations)

# Next Time...

- In our next session, we will look at **Interaction - Usability and Interfaces**