

Desain Interaksi

Definisi, Usability & User Experience

IF3151 Human Computer Interaction

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Al-ghazali



Tujuan Perkuliahan

01

Desain Interaksi

Memahami apa itu desain interaksi, lingkup, karakteristik, dan tujuannya

02

Usability

Memahami apa itu Usability dan kriterianya

03

User Experience

Memahami apa itu user experience

What is Design

“Design is a plan for arranging elements in such a way as best to accomplish a particular purpose”

Charles Eames

What is interaction design?

“ Designing interactive products to support the way people communicate and interact in their everyday and working lives. ”

Sharp, Rogers, and Preece
(2019)

“ The design of spaces for human communication and interaction.

Winograd
(1997)

“ The design of the interaction between users and product.

Involve elements like aesthetics, motion, sound, space, and many more.

What to design



Need to take into account:

- **Who** the users are
- **What** activities are being carried out
- **Where** interaction is taking place

Need to optimize the interactions users have with a product:

- So that they match the users' **activities** and **needs**

Goals of interaction design

Desain Interaksi

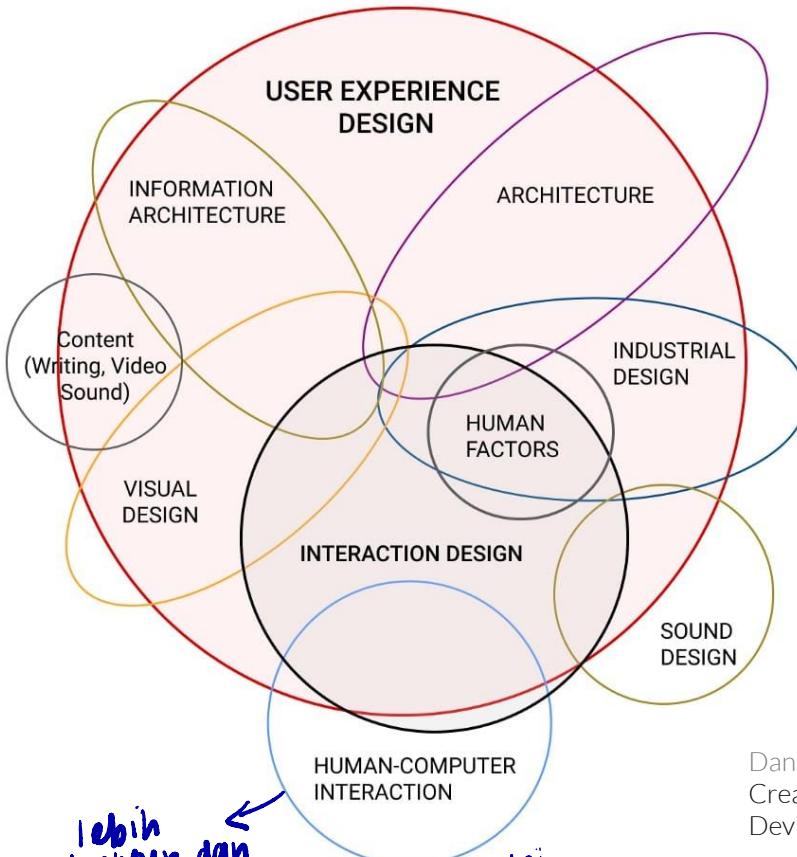
usability.

user experience

● Develop usable products

- Usability means easy to learn, effective to use, and provides an enjoyable experience
- Involve users in the design process

● To create product that enable the user to achieve their objectives in the best way possible



hal² yg terlibat
dalam desain
interaksi



lebih
terstruktur dan
bisa di eval,
berhubungan ke art
dengan interaksi
berhubungan ke art

Program Studi Teknik Informatika
Institut Teknologi Bandung.

Dan Saffer, Designing for Interaction:
Creating Innovative Applications and
Devices (Voices That Matter) 2nd Edition

The user experience (UX)

User experience (UX) refers to any interaction a user has with a product or service

- The way people **feel** about it and their **pleasure** and **satisfaction** when using it, looking at it, holding it, and opening or closing it
- Encompasses all aspects of the end-user's interaction with the company, its services, and its products. (Nielsen and Norman, 2014)
- “Every product that is used by someone has a user experience: newspapers, ketchup bottles, reclining armchairs, cardigan sweaters.” (Garrett, 2010)

Cannot design a user experience–only can design for a user experience

User Experience is not about technology, industrial design, or interfaces. It is about creating a meaningful experience through a device. (Marc H.)

Defining user experience

“ How **users** perceive a **product**, such as whether a smartwatch is seen as sleek or chunky, and their emotional reaction to it, such as whether people **have a positive experience** when using it. ”

Hornbæk and Hertzum
(2017)

Hassenzahl's (2010) model of the user experience

Pragmatic: how **simple, practical, and obvious** it is for **the user to achieve** their goals

Hedonic: how **evocative** and **stimulating** the interaction is to users

apa yg divasakan pengguna ketika menggunakan aplikasi (feeling). bukan fitur²nya.
ux ini dampak/efek dan usability.
contoh : apple sm android mungkin
usability nya sama, tapi ux
nya mungkin beda.

User experience goals

Selecting terms to convey a person's feelings, emotions, and so forth can help designers understand the multifaceted nature of the user experience



Usability goals

“Usability *is* a measure of how well a specific user in a specific context can use a product/design to achieve a defined goal.”

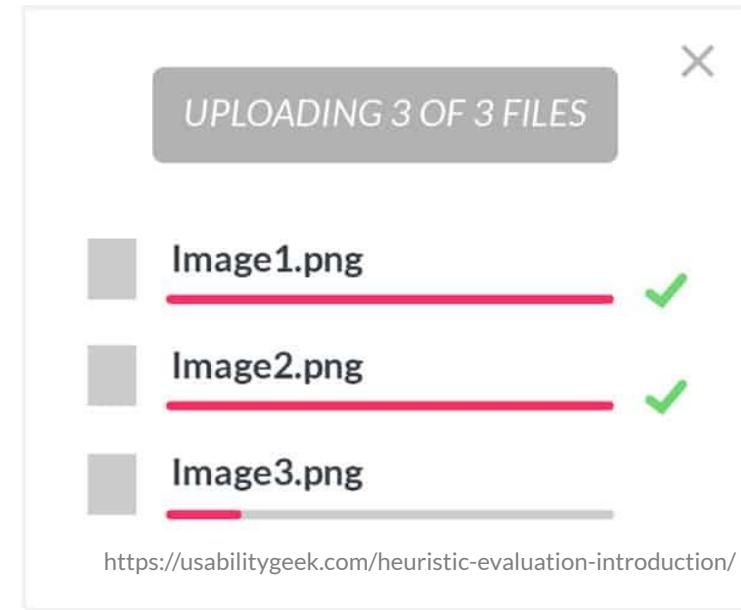
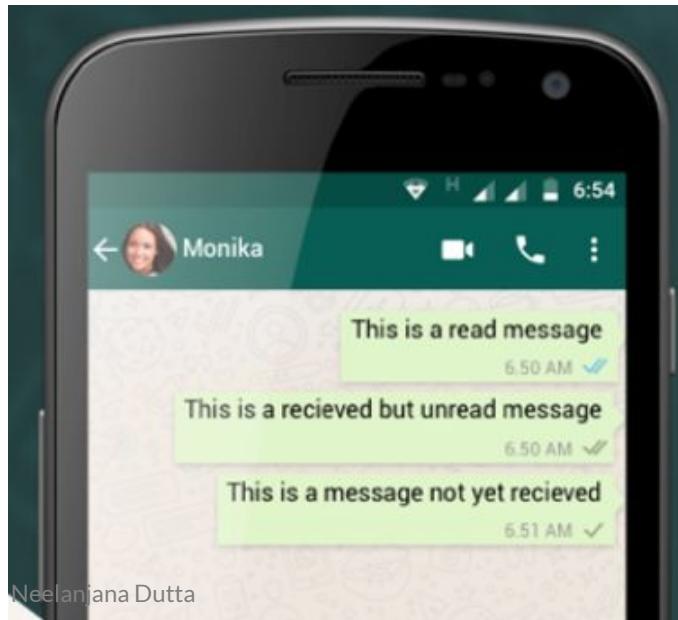


10 Usability Heuristics

-  Visibility of system status
-  Match between system and the real world
-  User control and freedom
-  Consistency and standards
-  Error prevention
-  Recognition rather than recall
-  Flexibility and efficiency of use
-  Aesthetic and minimalist design
-  Helps users recognise, diagnose, and recover from errors
-  Help and documentation

Visibility of System Status

The user should know what's going on inside the system.



Match Between System and Real Worlds

Systems should speak the users' language with familiar words, phrases, and concepts rather than system-oriented terms.



Neelanjana Dutta

Add title

Event Focus time Out of office Task Reminder

Sunday, August 21 10:00pm – 11:00pm

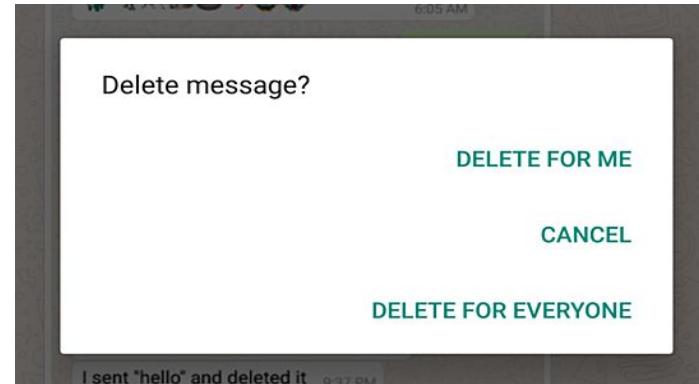
August 2022						
S	M	T	W	T	F	S
31	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	1	2	3
4	5	6	7	8	9	10

Add description or attachments

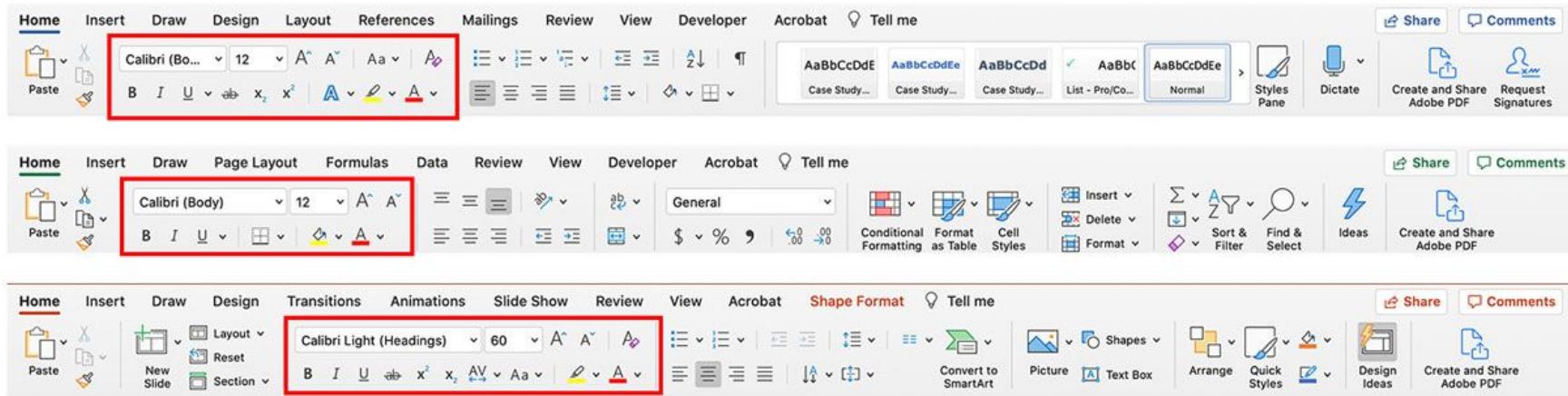
A screenshot of a digital calendar or event creation interface. At the top, there's a text input field labeled 'Add title'. Below it is a horizontal menu bar with tabs: 'Event' (which is selected and highlighted in blue), 'Focus time', 'Out of office', 'Task', and 'Reminder'. Underneath the menu, the date 'Sunday, August 21' and time '10:00pm – 11:00pm' are displayed. A large, semi-transparent calendar for August 2022 is overlaid on the interface. The calendar shows all days of the month with their corresponding dates. The date '21' is circled with a blue circle, indicating it is the selected date for the event. At the bottom of the calendar, there are buttons for navigating between months ('<' and '>'). Below the calendar, there is a placeholder text field labeled 'Add description or attachments'.

User Control and Freedom

Giving the user the freedom to navigate and perform actions.

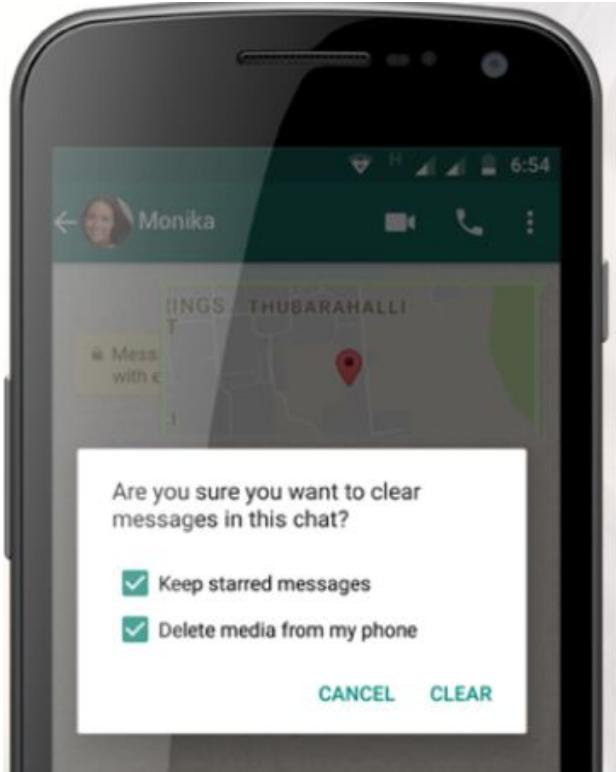


Consistency and Standards



Word (top), Excel (middle), and PowerPoint (bottom).

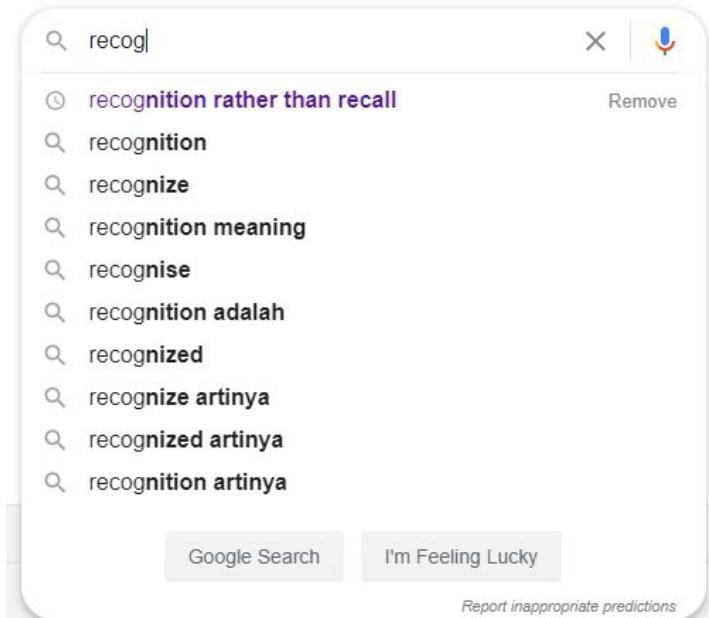
Error Prevention



Neelanjana Dutta

Recognition rather than Recall

Google

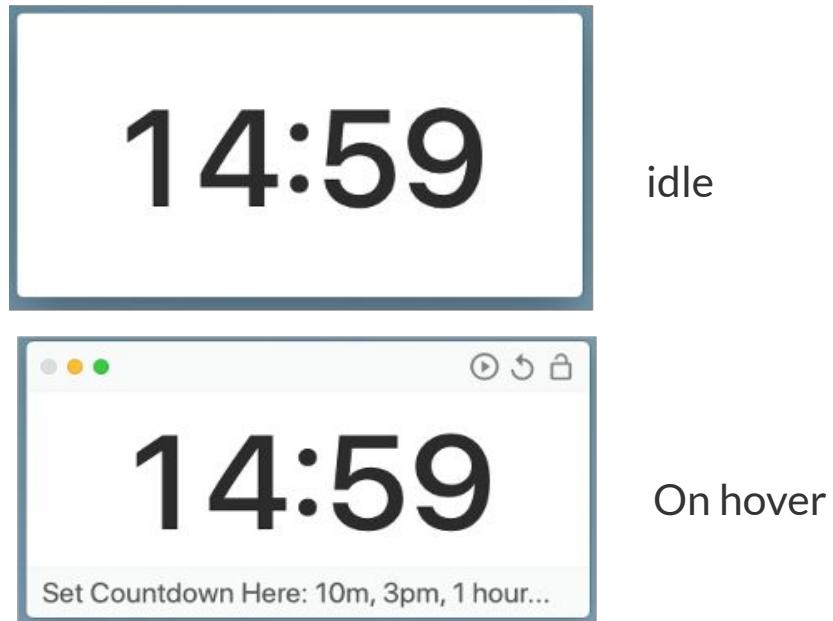


Aesthetic and Minimalist Design

Aesthetically pleasing designs can provide memorable experiences that differentiate a brand.

However, interfaces should only include necessary elements, with high informational value.

Clarity will always win over visual flourish.



<https://www.nngroup.com/articles/aesthetic-minimalist-design/>

Help Users Recognise, Diagnose, and Recover from Errors



Create your Google Account

First name test	Last name test
--------------------	-------------------

Username trest1235334353535353	@gmail.com
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You can use letters, numbers & periods

[Use my current email address instead](#)

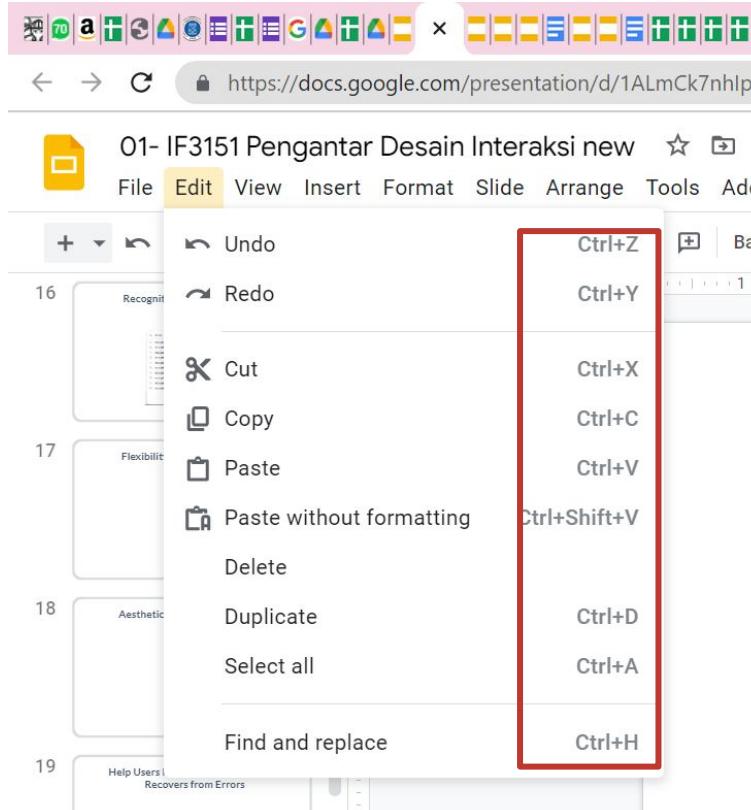
Password	Confirm	?
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! Use 8 characters or more for your password

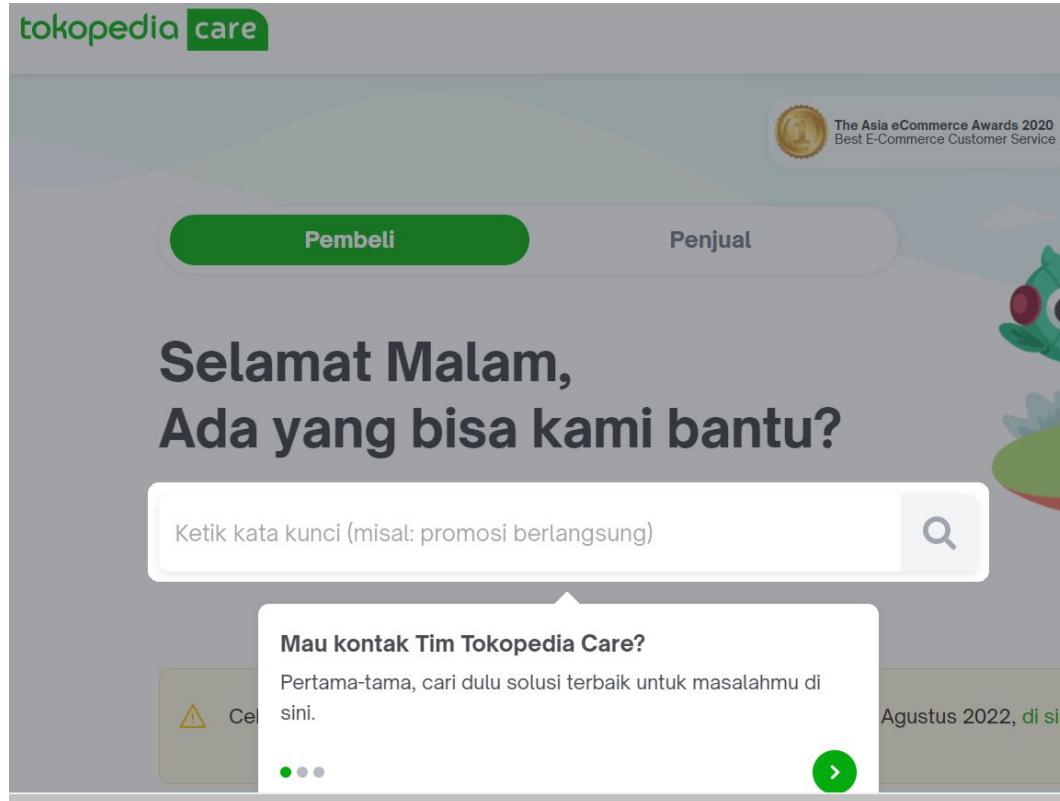
[Sign in instead](#)

Next

Flexibility and Efficiency of Use



Help and Documentation

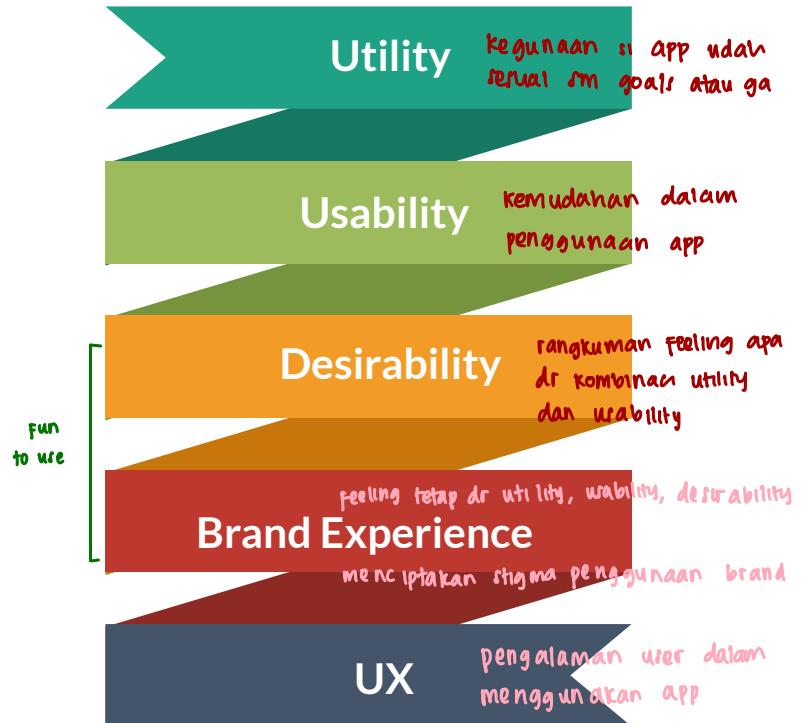


Usability goals & User Experience goals

Usability is a component of user experience (UX) design.

Are there trade-offs between the two kinds of goals?

For example, can a product be both *fun and safe*?



Interaction Design Methods (1)

Activity-centered Design

- Good for intense, focused, complex activities
- Refining task flows
- Making actions mode efficient
- Not good for big picture rethinking

System Design

- Good for large-scale designs
- Models for large teams
- Not good for small project
- Very analytical

Interaction Design Methods (2)

Genius Design

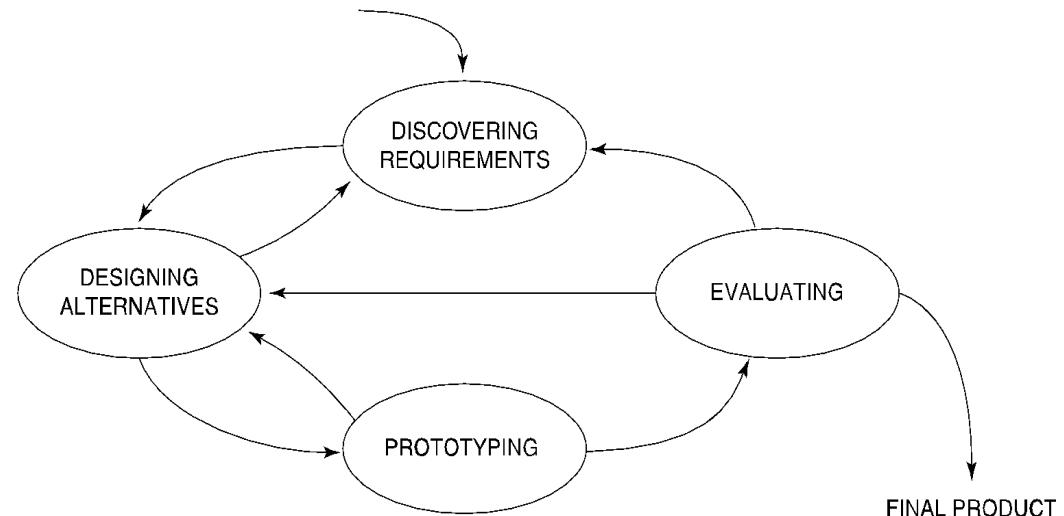
- Good for rapid project
- Possible to get a “purer” vision and more radical jumps in products
- Flexible
- Not good for inexperienced designers
- Need domain knowledge
- Can be very, very wrong

User-centered Design

- Understand unfamiliar domains
- Empathy with users-focus on people
- Can catch problems (and opportunities) up front
- Hard for people to evaluate (and generate) new product ideas
- Are you focused on the RIGHT users?
- User goals can be slippery
- Does it scale?

Basic Activities of Interaction Design

- 01** Discovering requirements
- 02** Designing alternatives
- 03** Prototyping alternative designs
- 04** Evaluating product and its user experience throughout



Core characteristics of interaction design

27

01



Users should be involved

03



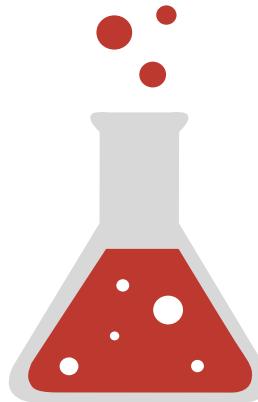
Specific usability and user experience goals need to be identified, clearly documented, and agreed to at the beginning of the project



Iteration is needed through the core activities

Help designers

- ➊ Understand how to design interactive products that fit with what people want, need, and may desire
- ➋ Appreciate that one size does not fit all (for example, teenagers are very different to grown-ups)
- ➌ Identify any incorrect assumptions they may have about particular user groups. (for example, not all old people want or need big fonts)
- ➍ Be aware of both people's sensitivities and their capabilities



*Creativity is the key to success
in the great education*

Terima Kasih

sama-sama

Konseptualisasi Desain Interaksi

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Conceptualizing Design

Conceptualizing design:

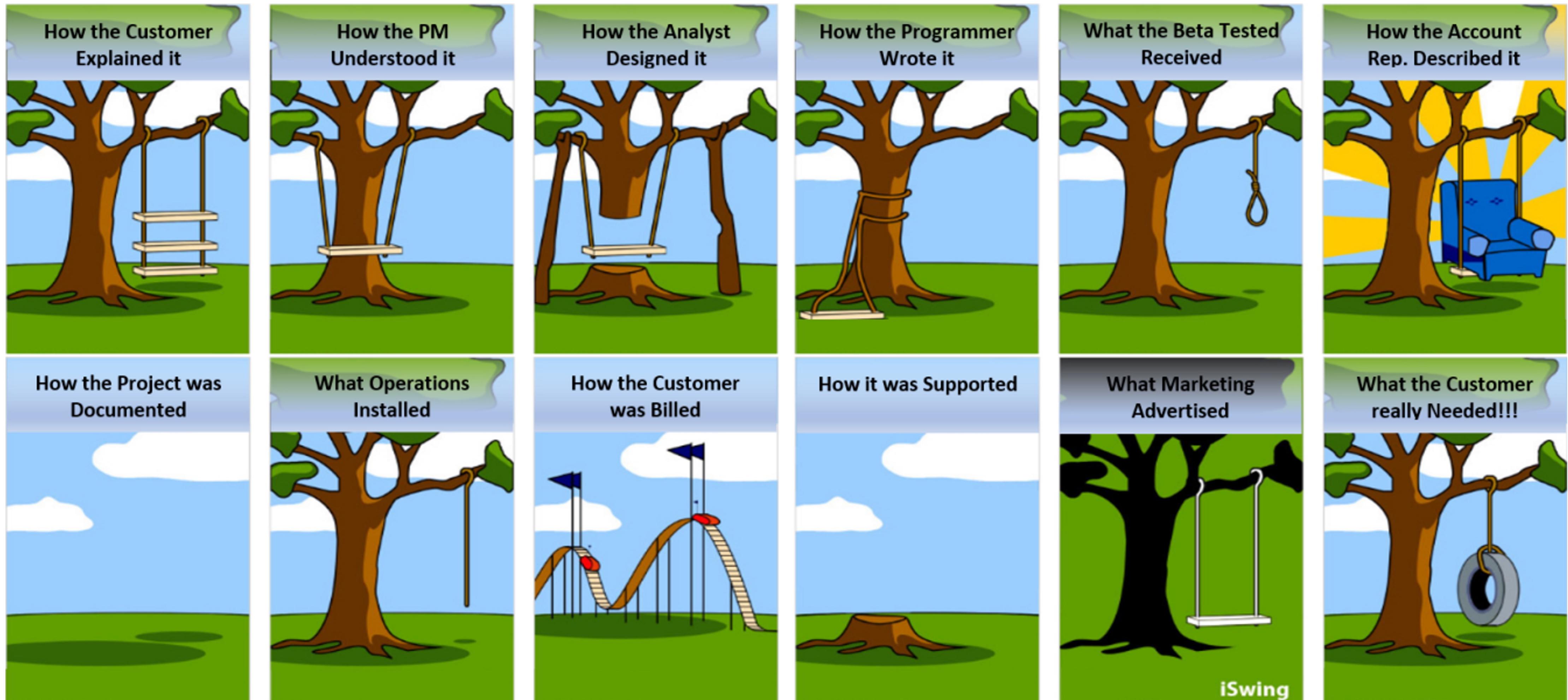
Proof of concept: Conceptualize what the proposed product will do

Conceptual model:

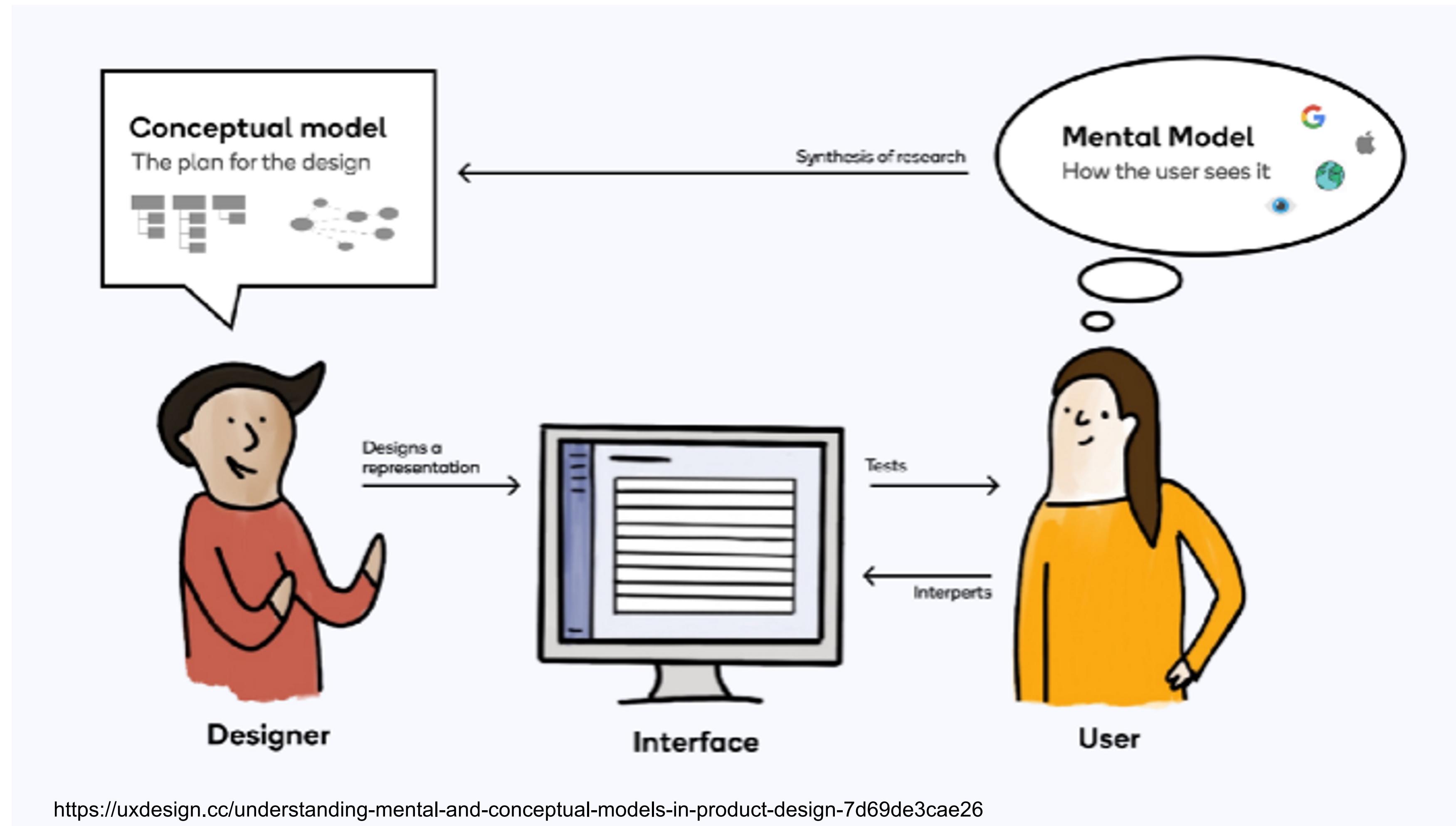
“...a high-level description of how a system is organized and operates” (Johnson and Henderson, 2002, p26)

- What users can do with it and the concepts they need to understand how to interact with it

Why to conceptualize



Conceptual Model vs User Model



Introduction
to Conceptual
Models - Intro
to the Design
of Everyday
Things

Don Norman



Why the need to conceptualizing design?

1

To make sure what we are going to build is what is expected

2

To scrutinize vague ideas and assumptions about the benefits of the proposed product

3

How realistic is it to develop?

4

How desirable and useful?

Developing a conceptual model involves:

1

Understanding the problem space

Having a good understanding of the problem space can help inform the design space (For example, what kind of interface, behavior, functionality to provide)

2

Being clear about your assumptions and claims

3

Specifying how the proposed design will support users (develop conceptual model itself)

A Framework for Analyzing the Problem Space

- **Are there problems** with existing product or user experience
 - if so, what are they?
- **Why do you think there are problems?**
- **How do you think your proposed design ideas might overcome these problems?**
- **If you are designing for a new experience, how do you think your proposed design ideas support, change, or extend current ways of doing things?**

Assumptions and Claims

When coming up with a new design: write down your assumptions and claims

Assumptions:

Taking something for granted when it needs further investigation

For example, people will want to watch TV while driving

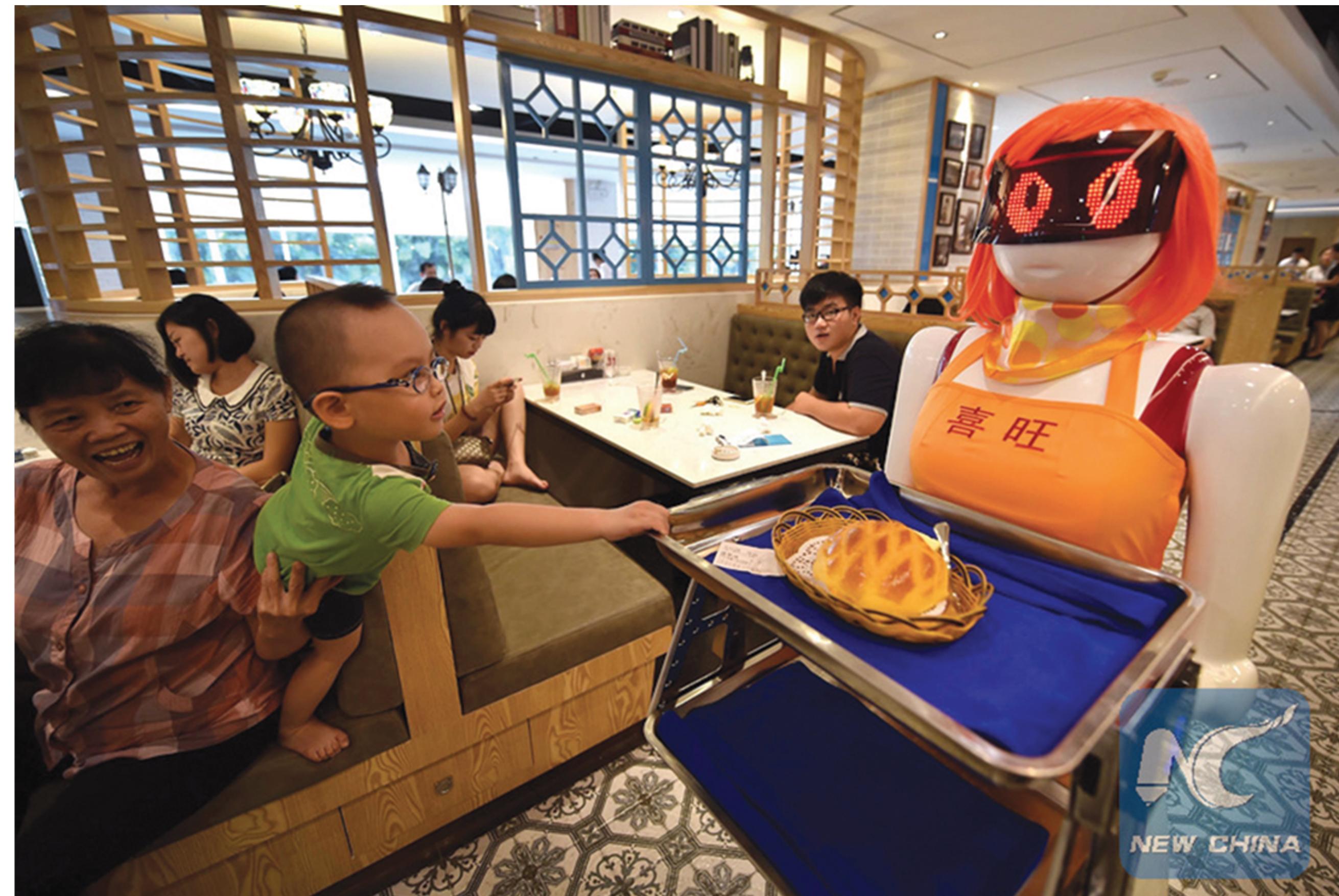


Claims:

Stating something to be true when it is still open to question

For example, “a multimodal style of interaction for controlling GPS – one that involves speaking while driving – is safe.”

Activity: How will robot waiters enhance UX



Source: Xinhua, Guo Cheng

Activity: How will robot waiters enhance UX

The benefits:

- The robot could take orders and entertain customers by having a conversation with them
- The robot could make recommendations for different customers, such as restless children or fussy eaters



Assumptions

Thus, enhance the UX



Claims

The real problem being addressed:

“It is difficult to recruit good wait staff who provide the level of customer service to which we have become accustomed.”

Conceptual Model Components

01

Metaphors
and
analogies

02

Concepts

03

Relationship
and mappings
between these
concepts

Interface metaphors

Interface designed to be similar to a physical entity but also has own properties

- For example, desktop metaphor, and web portals

Can be based on activity, object, or a combination of both

Exploit user's familiar knowledge, helping them to understand 'the unfamiliar'

- Makes learning new systems easier

Examples of interface metaphors

1

What user are doing
(activities)

Ex: Surfing the web

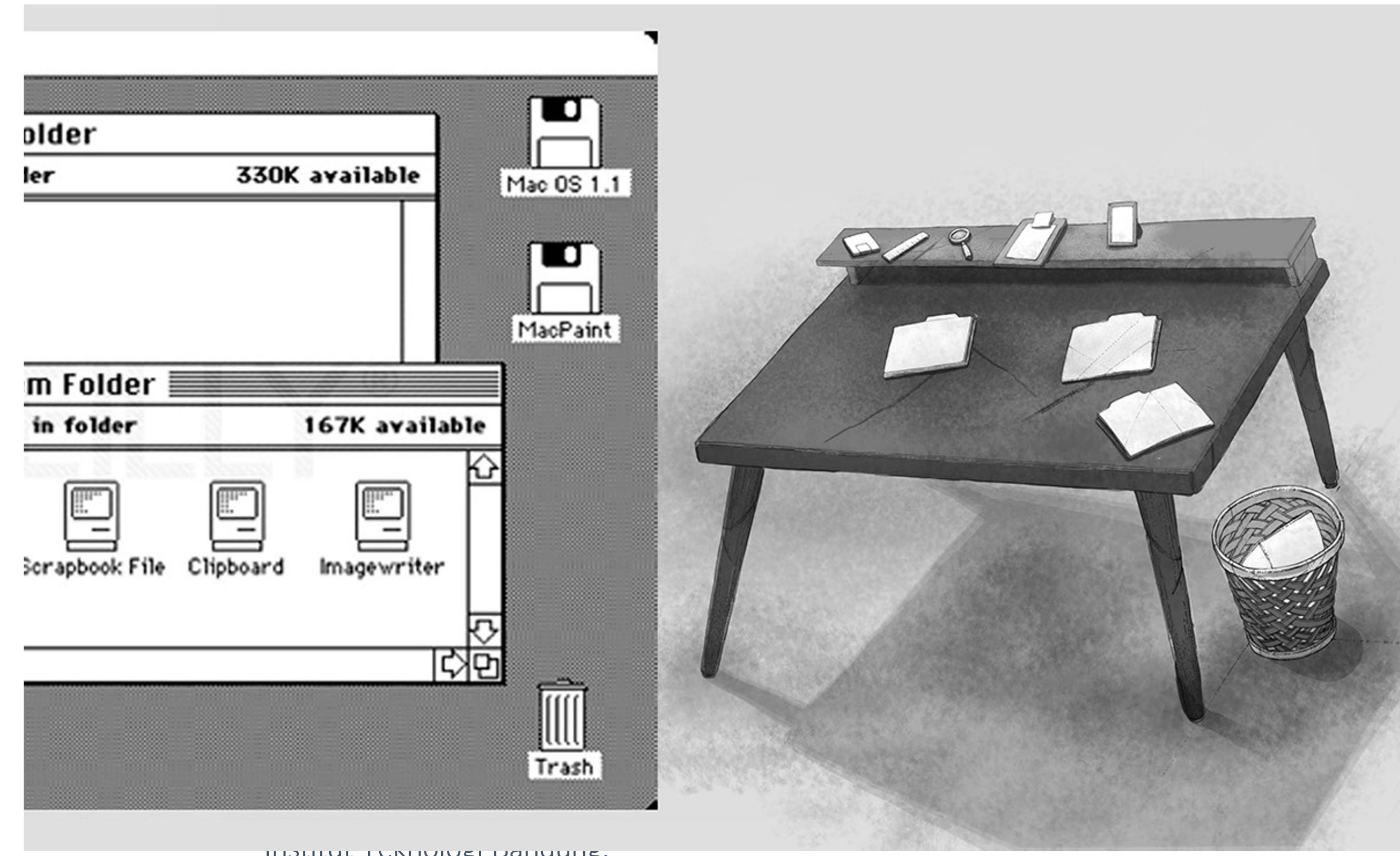


Examples of interface metaphors

2

Instantiated at the interface (Object)

Ex: the desktop metaphor



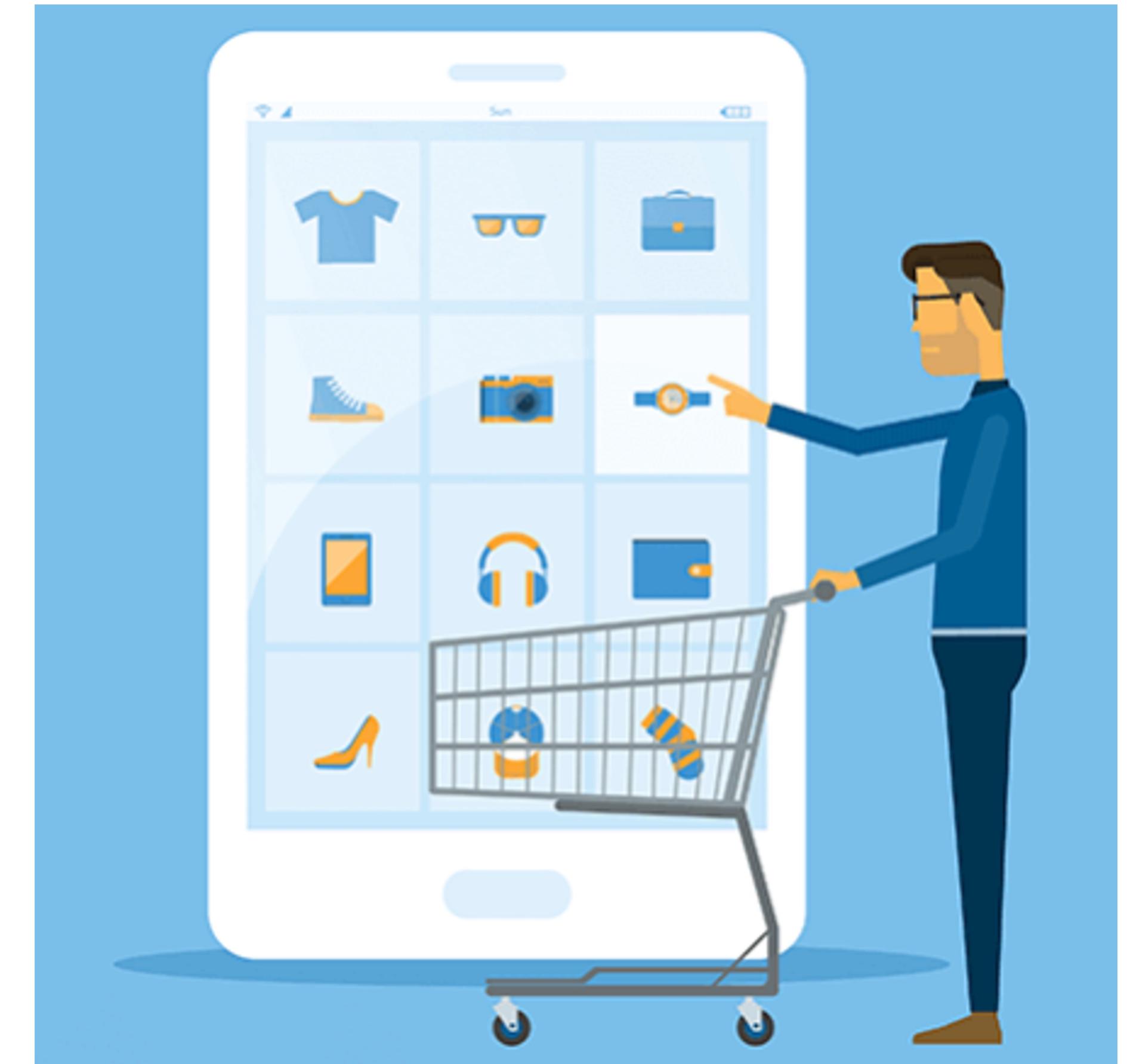
[https://www.behance.net
/gallery/40202533/Desktop-metaphor-example-%28June-2016%29](https://www.behance.net/gallery/40202533/Desktop-metaphor-example-%28June-2016%29)

Examples of interface metaphors

3

Visualizing an operation

- An icon of a shopping cart into which the user places items
- Drag and drop for items selection



<https://www.justinmind.com/blog/shopping-cart-design/>

Problems with interface metaphors

- Break conventional and cultural rules
For instance, recycle bin placed on desktop
- Conflicts with design principles
- Designers can inadvertently use bad existing designs and transfer the bad parts over
- Limits designers' imagination in coming up with new conceptual models
- Forces users to understand only the system in terms of the metaphor

Interaction Types

“A description of what the user is doing when interacting with a system”

01

Instructing

Issuing commands and selecting options

02

Conversing

Interacting with a system as if having a conversation

03

Manipulating

Interacting with objects in a virtual or physical space by manipulating them

04

Exploring

Moving through a virtual environment or a physical space

05

Responding

The system initiates the interaction and the user chooses whether to respond

Interaction Types

01 Instructing

Issuing commands and selecting options

Where users instruct a system and tell it what to do

For example: Tell the time, print a file, or save a file

Very common conceptual model underlying a diversity of devices and systems

For instance: Word processors, home devices, and vending machines

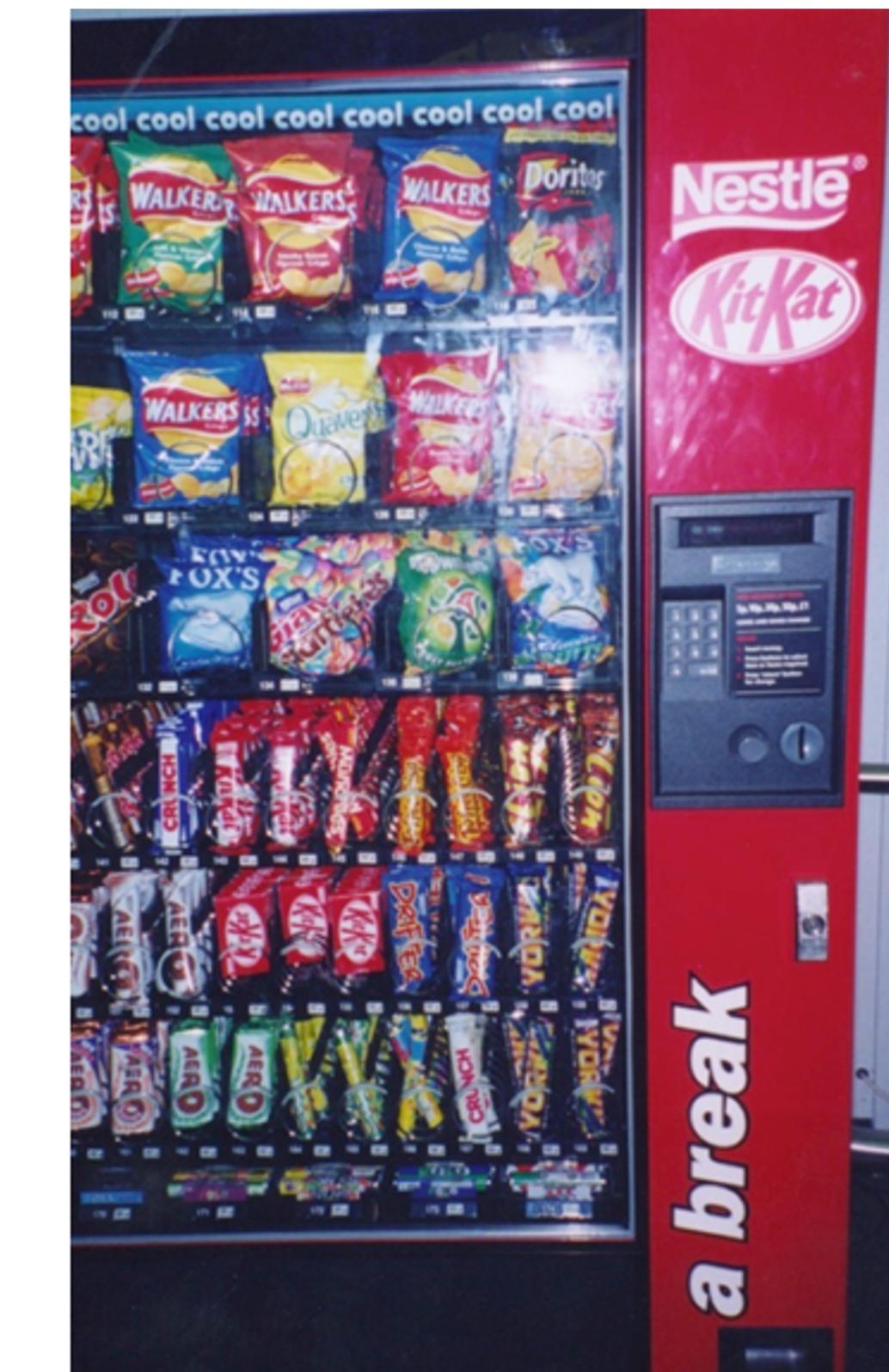
The main benefit is that instructing supports quick and efficient interaction

Good for repetitive kinds of actions performed on multiple objects

Which is easiest and why

01 Instructing

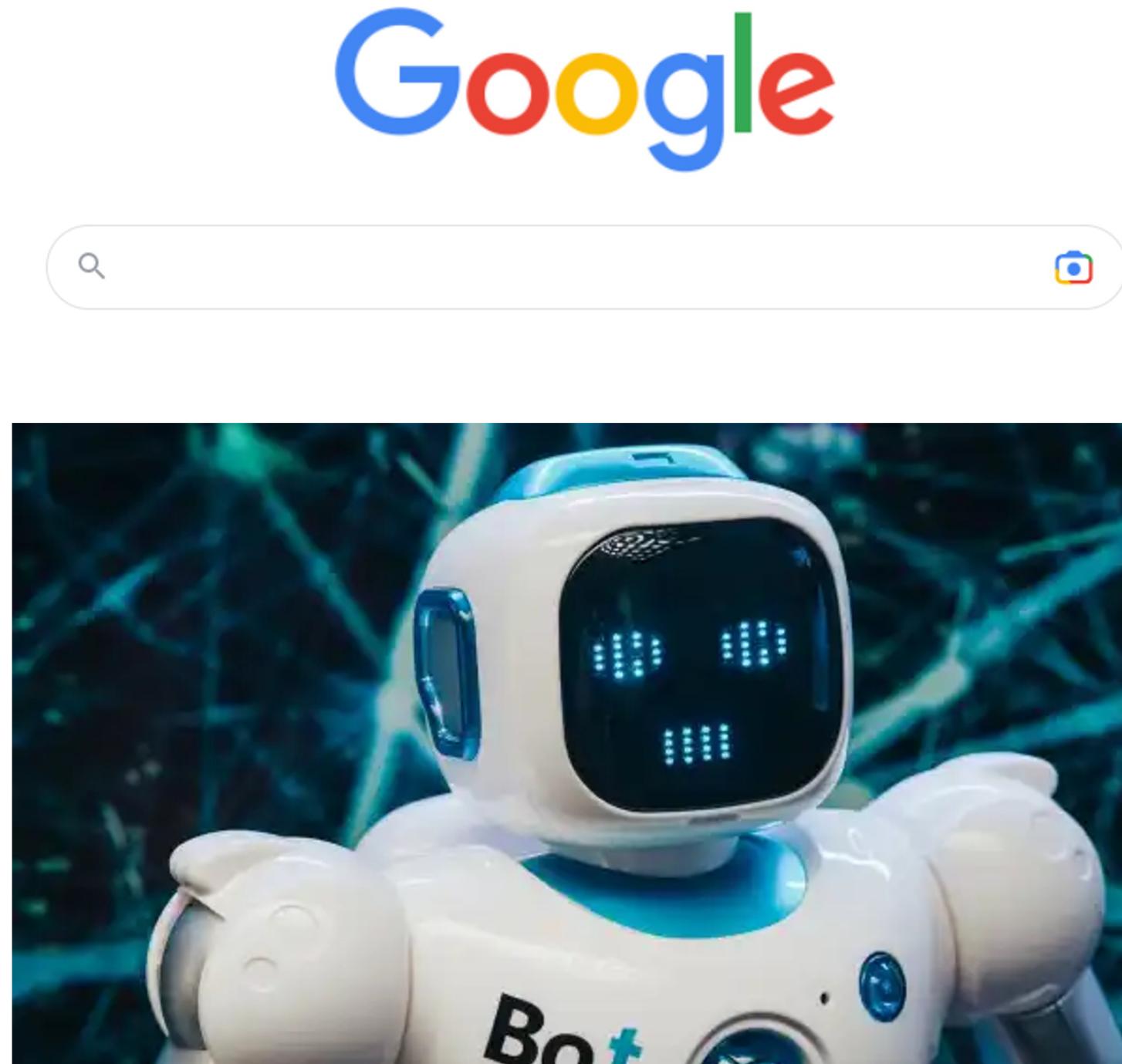
Issuing commands and selecting options



Interaction Types

02 **Conversing**

Interacting with a system as if having a conversation



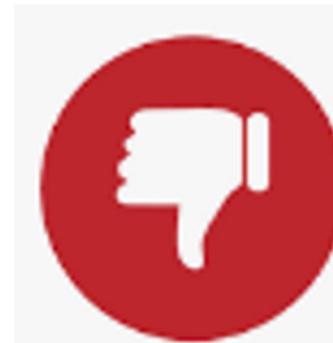
- From simple voice recognition menu-driven systems to more complex ‘natural language’ dialogs
- Examples:
 - search engines
 - advice-giving systems/ help systems
 - Virtual agents, chatbots, toys, and pet robots designed to converse with you

Pros and Cons of Conversation Model



Allows users, especially novices, to interact with a system in a way that is familiar to them

- Can make them feel comfortable, at ease, and less scared



Misunderstandings can arise when the system does not know how to parse what the user says

- For example, voice assistants can misunderstand what children say



**“If you’d like to press 1, press 3.
If you’d like to press 3, press 8.
If you’d like to press 8, press 5...”**

Interaction Types

03 Manipulating

Interacting with objects in a virtual or physical space by manipulating them

Involves dragging, selecting, opening, closing and zooming actions on virtual objects

Exploit's users' knowledge of how they move and manipulate in the physical world

Can involve actions using:

- physical controllers (Nintendo Wii)
- air gestures (Microsoft Kinect)

to control the movements of an on-screen avatar





Pros of Manipulation Model

- Novices can learn the basic functionality quickly
- Experienced users can work rapidly to carry out a wide range of tasks
- Intermittent users can retain operational concepts over time
- Error messages rarely needed
- Users can immediately see if their actions are furthering their goals, and if not, do something else
- Users experience less anxiety
- Users gain confidence and mastery and feel in control



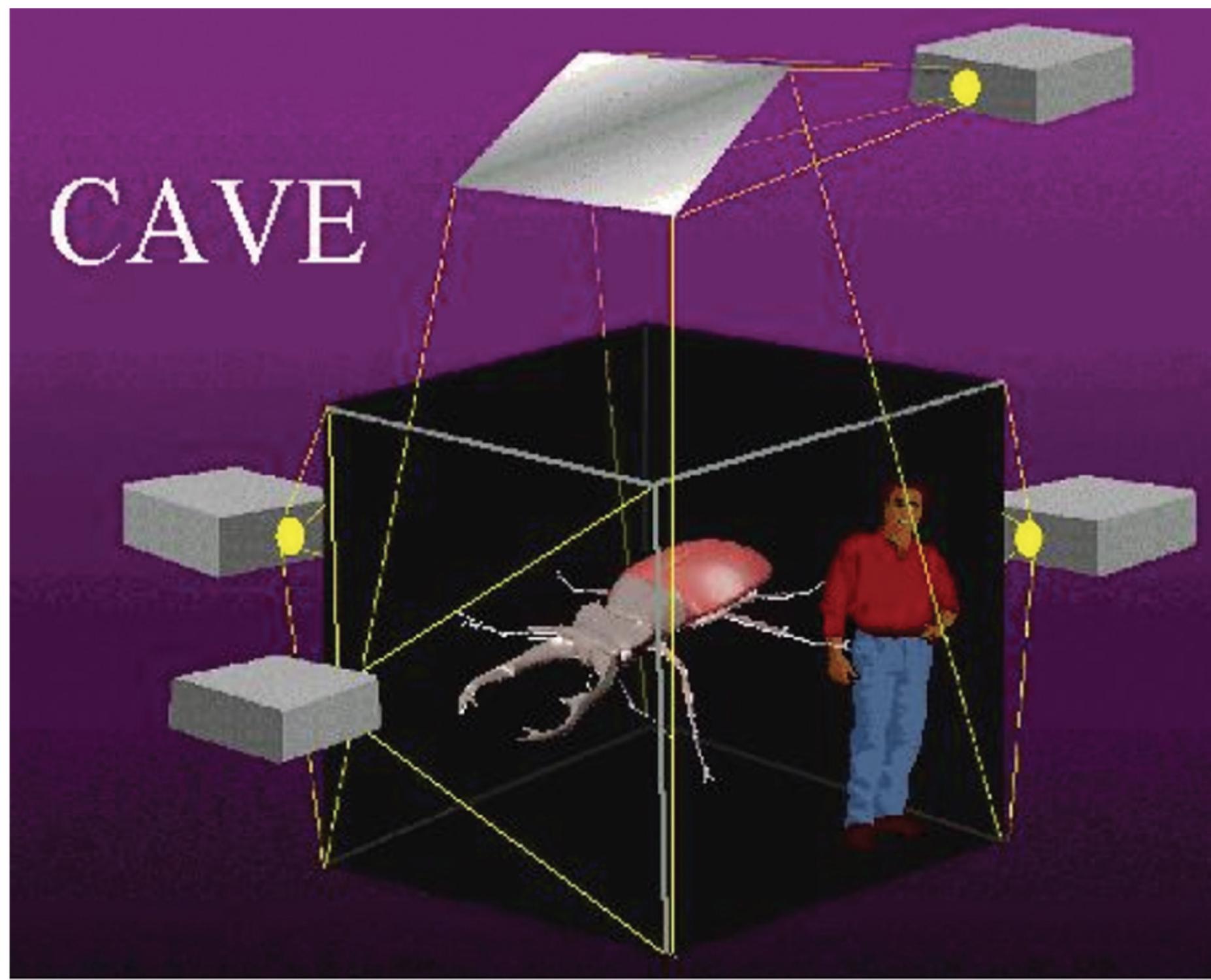
Cons of Manipulation Model

- Not all tasks can be described by objects
- Not all actions can be done directly
- Some tasks are better achieved through delegating, for example, spell checking
- Can become screen space ‘gobblers’
- Moving a cursor using a mouse or touchpad can be slower than pressing function keys to do the same actions

Interaction Types

04 Exploring

Moving through a virtual environment or a physical space



Cyber-Insects in the CAVE Source: [Alexei A. Sharov](#)

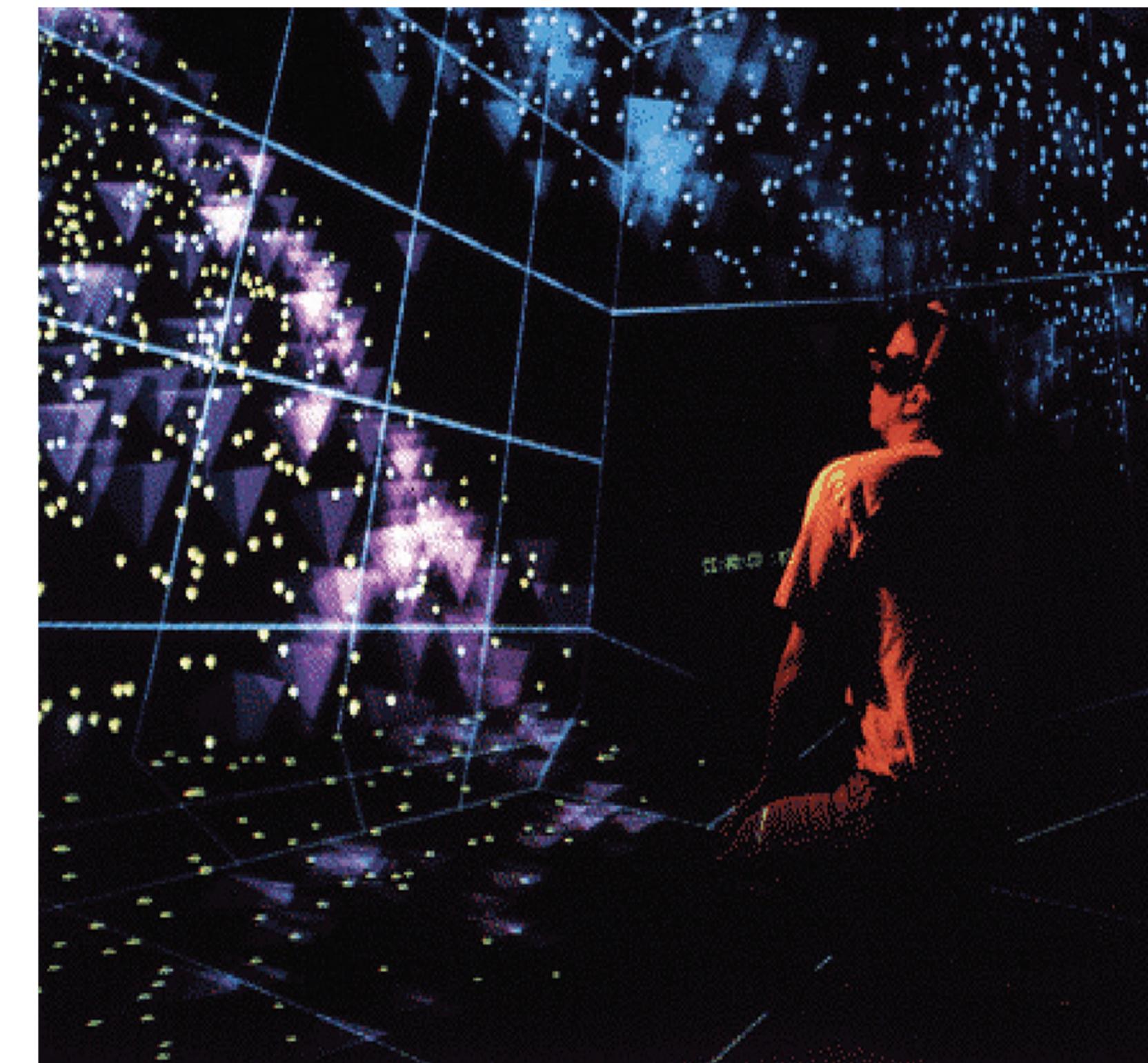


Image courtesy of Kalev Leetaru, National Center for Supercomputing Applications, University of Illinois.

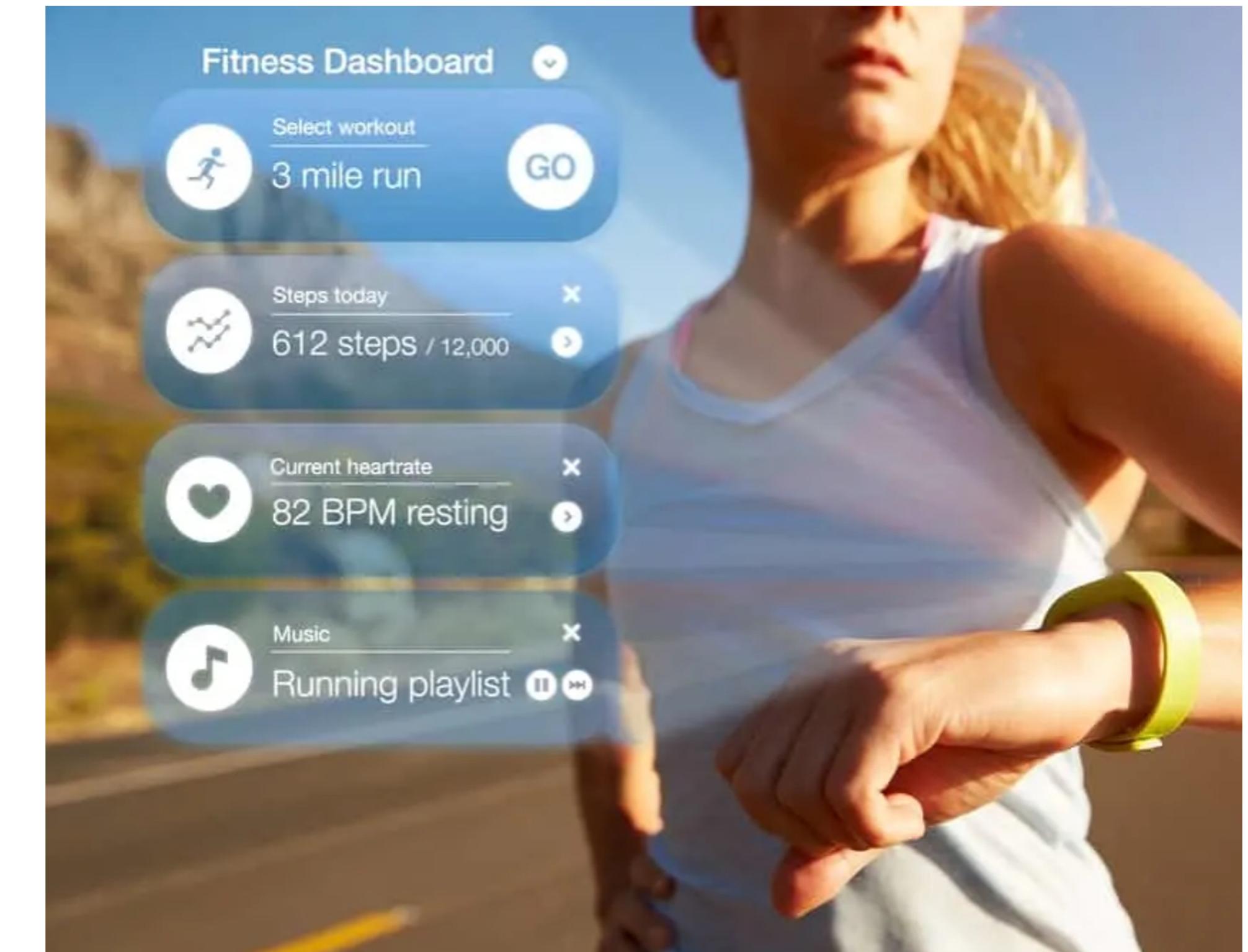
Interaction Types

05 Responding

The system initiates the interaction and the user chooses whether to respond

System takes the initiative to alert user to something that it “thinks” is of interest

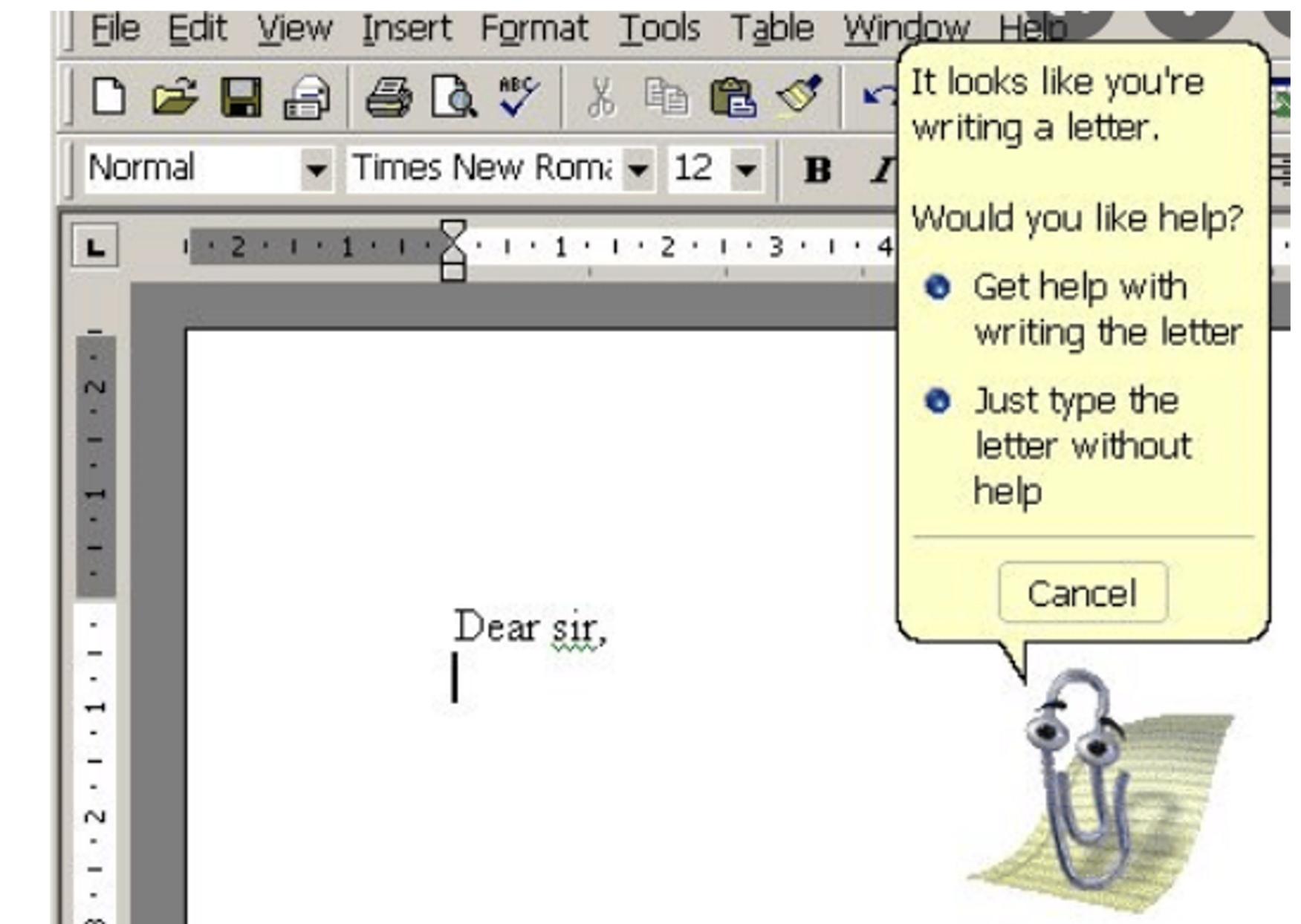
- Alerts the user of a nearby coffee bar where some friends are meeting
- User's fitness tracker notifies them of a milestone reached



Cons of Responding Model



- Can get tiresome or frustrating if too many notifications or the system gets it wrong
- What does it do when it gets something wrong?
Does it apologize?
Does it allow the user to correct the advise or information?



Choosing an Interaction Type

Direct manipulation

For certain tasks:

Designing, drawing, driving, sizing windows

Issuing instructions

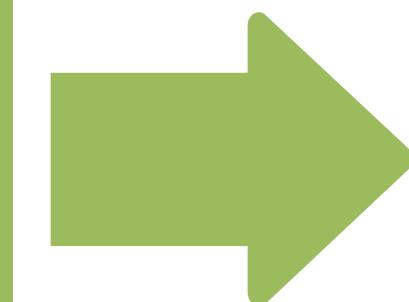
For repetitive tasks:

Spell-checking and file management

Having a conversation

For certain services:

Finding information or requesting music



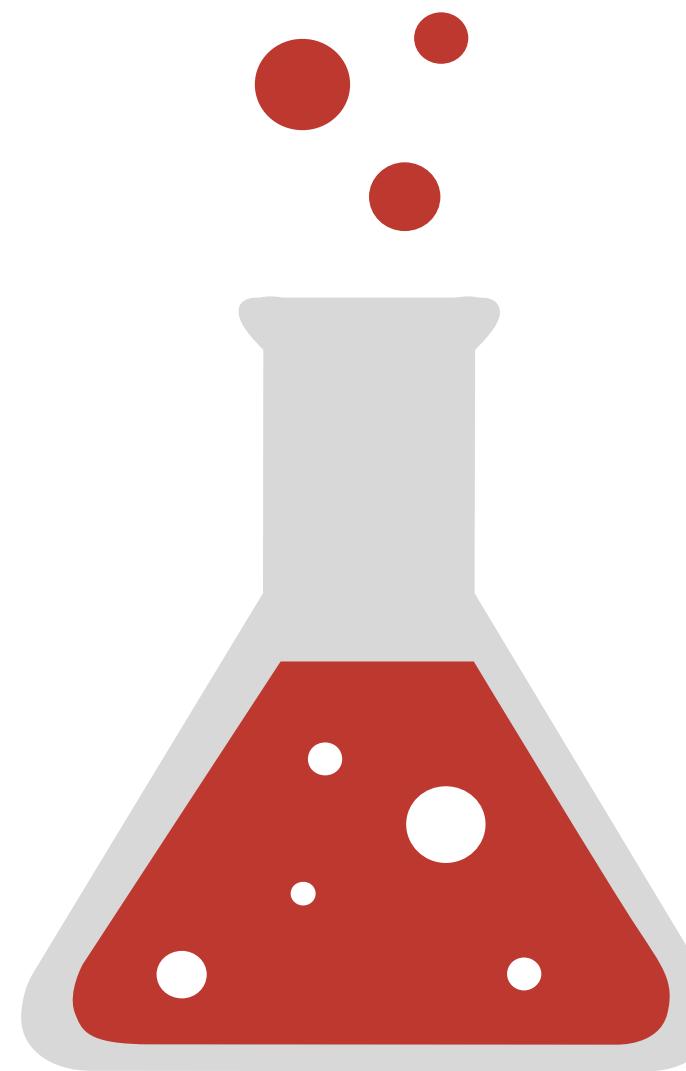
Hybrid conceptual

For supporting multiple ways of carrying out the same actions

Interface Types

“The kind of interface used to support the interaction”

- 01 Command**
- 02 Menu-based**
- 03 Gesture**
- 04 Voice**
- 05 etc (Chapter 7)**



*Creativity is the key to success
in the great education*

Terima Kasih

Cognitive Aspects

—

IF3151 Human Computer Interaction

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K2 Fitra Arifiansyah

K3 Adi Mulyanto / Maya Nabila

Overview

1

What is cognition?

2

Why it is important
to understand in
HCI

3

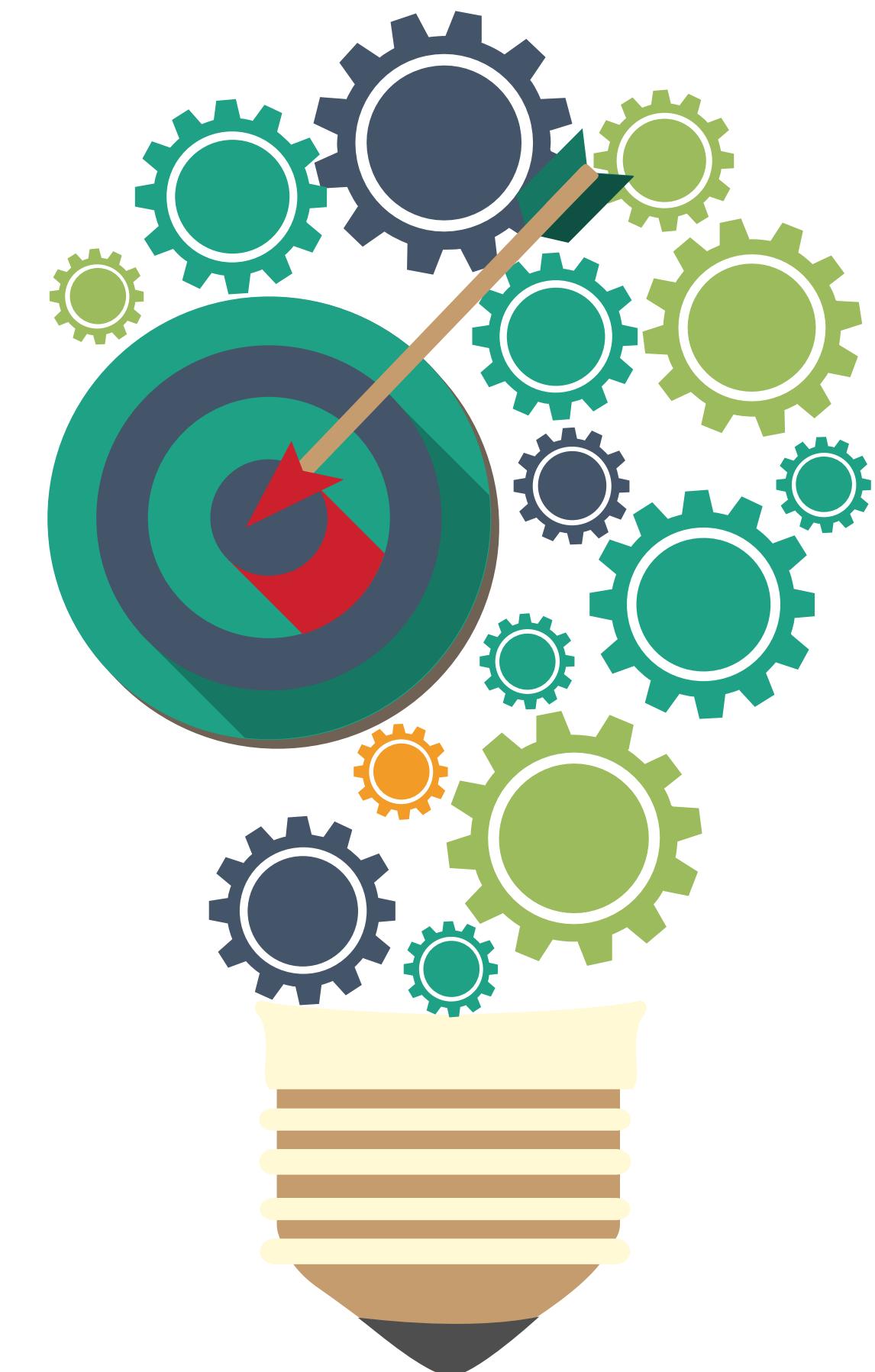
Describe how
cognition has been
applied to
interaction design

4

Explain what are
mental models
and how to elicit
them

5

Cover relevant
theories of
cognition



What goes on in the mind?

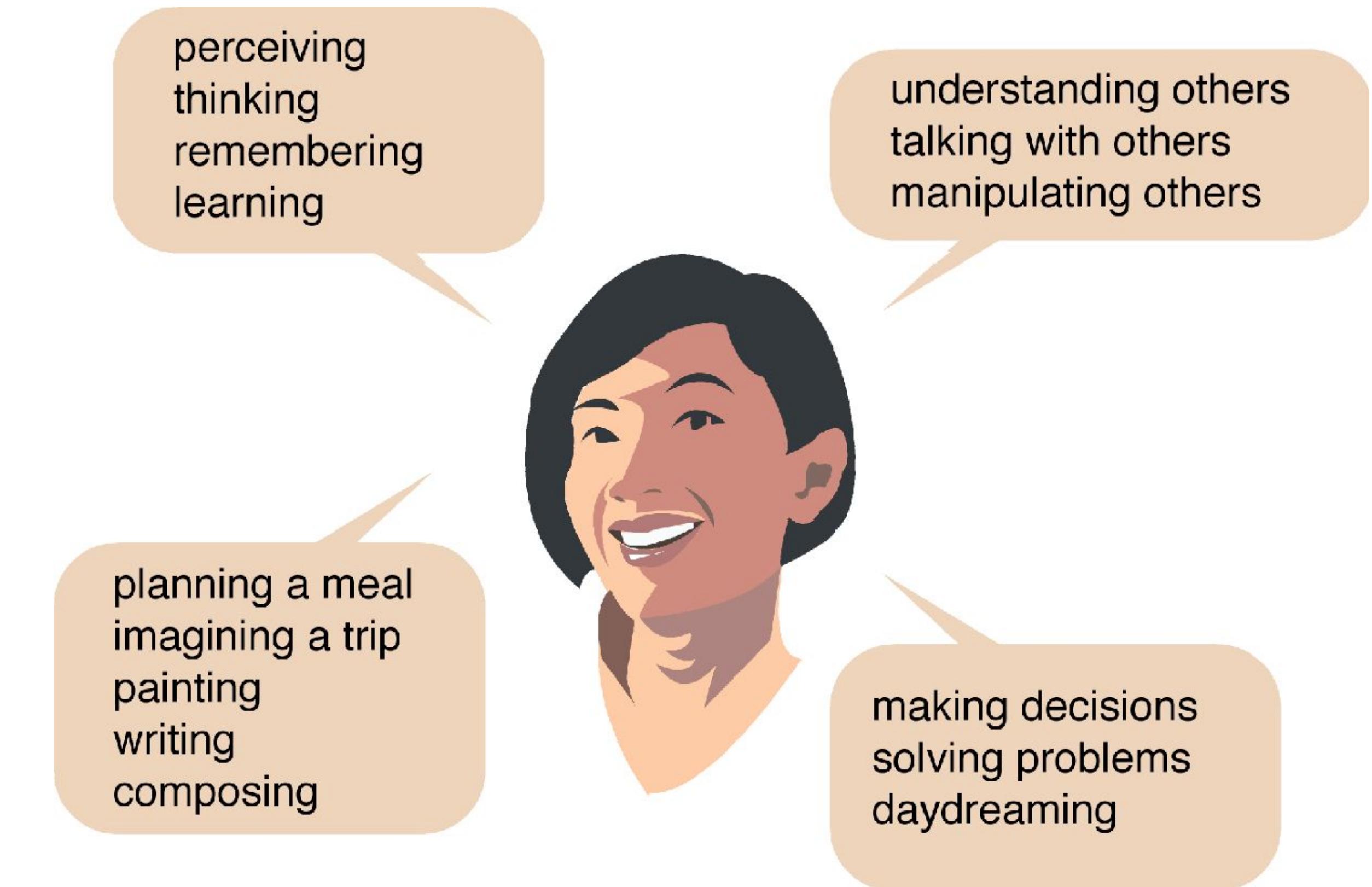
Cognition are

Ways of classifying cognition at a higher level:

- Experiential vs. reflective cognition
(Norman, 1993)
- Fast vs slow thinking (Kahneman, 2011)

Which involves fast vs slow thinking?

- $2 + 2 =$
- $21 \times 29 =$
- What color eyes do you have?
- How many colors are there in the rainbow?
- How many months in the year have 31 days?
- What is the name of the first school you attended?



Cognitive processes



Attention



Perception



Memory



Learning

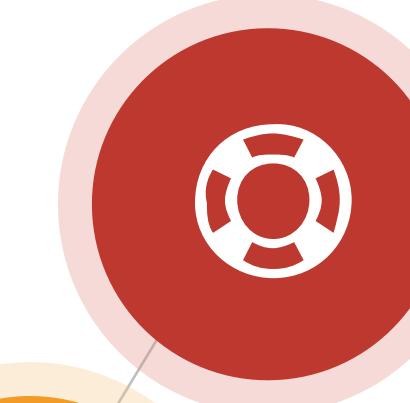
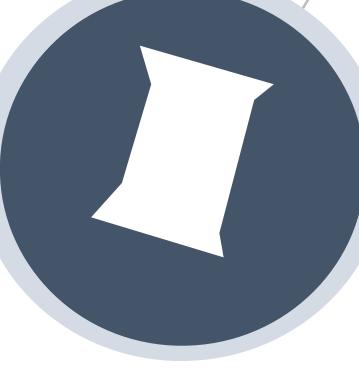


Reading, speaking and listening



Problem-solving, planning, reasoning and decision-making

Attention

-  Selecting things on which to concentrate at a point in time from the mass of stimuli around us
-  Allows us to focus on information that is relevant to what we are doing
-  Involves audio and/or visual senses
-  Focused and divided attention
 - Enables us to be selective in terms of the mass of competing stimuli, but limits our ability to keep track of all events
-  Design recommendation
 - Information at the interface should be structured to capture users' attention, for example, use perceptual boundaries (windows), color, reverse video, sound, and flashing lights

Activity: Find the price for a double room at the Quality Inn in Pennsylvania

Pennsylvania

Bedford Motel/Hotel: Crinaline Courts
(814) 623-9511 S: \$118 D: \$120

Bedford Motel/Hotel: Holiday Inn
(814) 623-9006 S: \$129 D: \$136

Bedford Motel/Hotel: Midway
(814) 623-8107 S: \$121 D: \$126

Bedford Motel/Hotel: Penn Manor
(814) 623-8177 S: \$119 D: \$125

Bedford Motel/Hotel: Quality Inn
(814) 623-5189 S: \$123 D: \$128

Bedford Motel/Hotel: Terrace
(814) 623-5111 S: \$122 D: \$124

Bradley Motel/Hotel: De Soto
(814) 362-3567 S: \$120 D: \$124

Bradley Motel/Hotel: Holiday House
(814) 362-4511 S: \$122 D: \$125

Bradley Motel/Hotel: Holiday Inn
(814) 362-4501 S: \$132 D: \$140

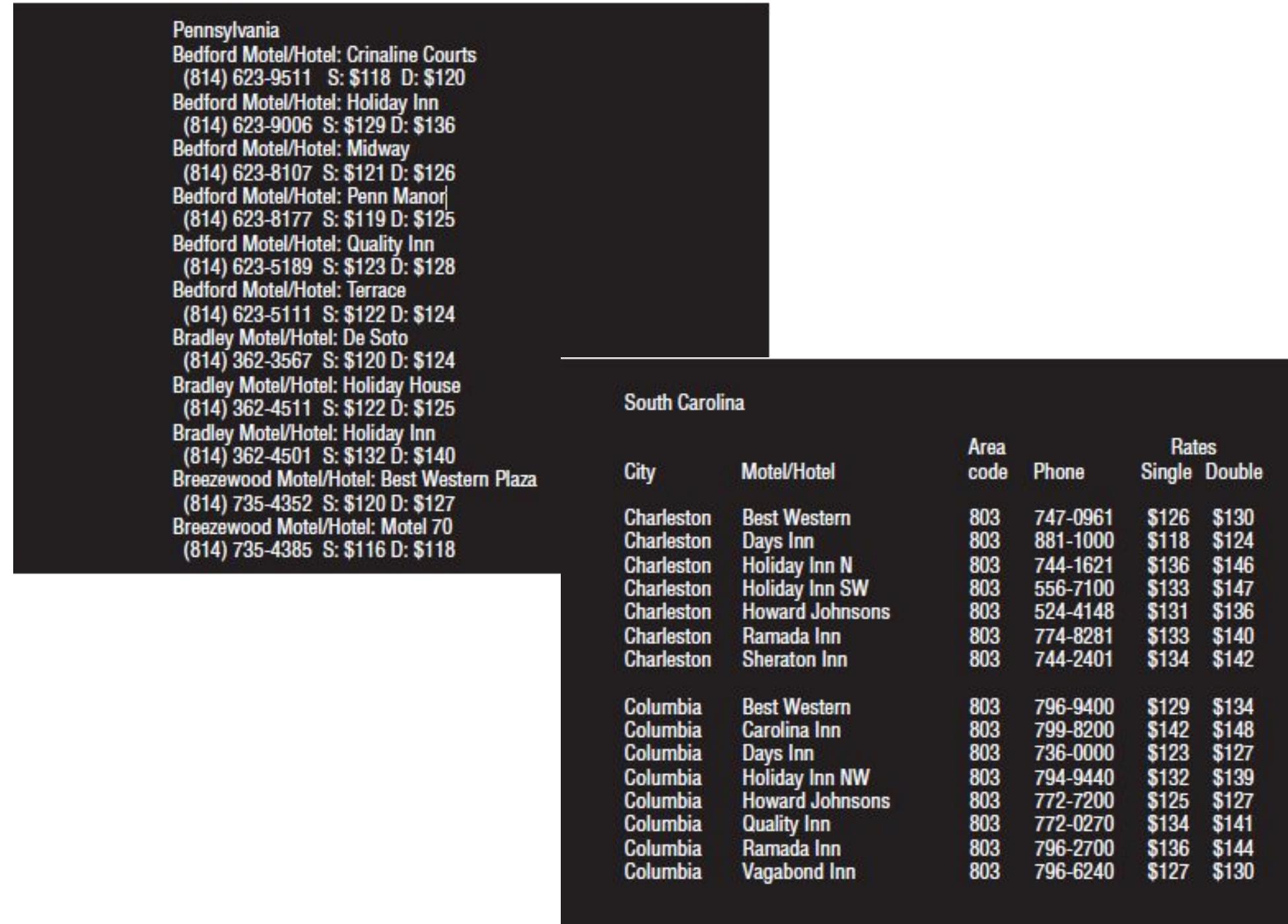
Breezewood Motel/Hotel: Best Western Plaza
(814) 735-4352 S: \$120 D: \$127

Breezewood Motel/Hotel: Motel 70
(814) 735-4385 S: \$116 D: \$118

Activity: Find the price of a double room at the Holiday Inn in Columbia

		South Carolina			
City	Motel/Hotel	Area code	Phone	Rates	
				Single	Double
Charleston	Best Western	803	747-0961	\$126	\$130
Charleston	Days Inn	803	881-1000	\$118	\$124
Charleston	Holiday Inn N	803	744-1621	\$136	\$146
Charleston	Holiday Inn SW	803	556-7100	\$133	\$147
Charleston	Howard Johnsons	803	524-4148	\$131	\$136
Charleston	Ramada Inn	803	774-8281	\$133	\$140
Charleston	Sheraton Inn	803	744-2401	\$134	\$142
Columbia	Best Western	803	796-9400	\$129	\$134
Columbia	Carolina Inn	803	799-8200	\$142	\$148
Columbia	Days Inn	803	736-0000	\$123	\$127
Columbia	Holiday Inn NW	803	794-9440	\$132	\$139
Columbia	Howard Johnsons	803	772-7200	\$125	\$127
Columbia	Quality Inn	803	772-0270	\$134	\$141
Columbia	Ramada Inn	803	796-2700	\$136	\$144
Columbia	Vagabond Inn	803	796-6240	\$127	\$130

Activity



Pennsylvania

Bedford Motel/Hotel: Crinaline Courts	(814) 623-9511	S: \$118	D: \$120
Bedford Motel/Hotel: Holiday Inn	(814) 623-9006	S: \$129	D: \$136
Bedford Motel/Hotel: Midway	(814) 623-8107	S: \$121	D: \$126
Bedford Motel/Hotel: Penn Manor	(814) 623-8177	S: \$119	D: \$125
Bedford Motel/Hotel: Quality Inn	(814) 623-5189	S: \$123	D: \$128
Bedford Motel/Hotel: Terrace	(814) 623-5111	S: \$122	D: \$124
Bradley Motel/Hotel: De Soto	(814) 362-3567	S: \$120	D: \$124
Bradley Motel/Hotel: Holiday House	(814) 362-4511	S: \$122	D: \$125
Bradley Motel/Hotel: Holiday Inn	(814) 362-4501	S: \$132	D: \$140
Breezewood Motel/Hotel: Best Western Plaza	(814) 735-4352	S: \$120	D: \$127
Breezewood Motel/Hotel: Motel 70	(814) 735-4385	S: \$116	D: \$118

South Carolina

City	Motel/Hotel	Area code	Phone	Rates
				Single Double
Charleston	Best Western	803	747-0961	\$126 \$130
Charleston	Days Inn	803	881-1000	\$118 \$124
Charleston	Holiday Inn N	803	744-1621	\$136 \$146
Charleston	Holiday Inn SW	803	556-7100	\$133 \$147
Charleston	Howard Johnsons	803	524-4148	\$131 \$136
Charleston	Ramada Inn	803	774-8281	\$133 \$140
Charleston	Sheraton Inn	803	744-2401	\$134 \$142
Columbia	Best Western	803	796-9400	\$129 \$134
Columbia	Carolina Inn	803	799-8200	\$142 \$148
Columbia	Days Inn	803	736-0000	\$123 \$127
Columbia	Holiday Inn NW	803	794-9440	\$132 \$139
Columbia	Howard Johnsons	803	772-7200	\$125 \$127
Columbia	Quality Inn	803	772-0270	\$134 \$141
Columbia	Ramada Inn	803	796-2700	\$136 \$144
Columbia	Vagabond Inn	803	796-6240	\$127 \$130



Tullis (1987) found that the two screens produced quite different results

- 1st screen - took an average of 5.5 seconds to search
- 2nd screen - took 3.2 seconds to search



Why, since both displays have the same density of information (31%)?



Spacing

- In the 1st screen the information is **bunched** up together, making it hard to search
- In the 2nd screen the characters are grouped into **vertical categories** of information making it easier

Design implications for attention

| Context: Make information salient when it needs to be attended to at a given stage of a task

| Use techniques to achieve this:

- For example, color, ordering, spacing, underlining, sequencing, and animation

| Avoid cluttering visual interfaces with too much information

| Consider designing different ways to support effective switching and returning to an interface

Perception



How information is acquired from the world and transformed into experiences

Obvious implication is to design representations that are readily perceivable, for instance:

- Text should be legible
- Icons should be easy to distinguish and read

Is color contrast good? Find Italian

Black Hills Forest	Peters Landing	Jefferson Farms	Devlin Hall	Webmaster	Curriculum	Student Life	Dance
Cheyenne River	Public Health	Psychophysics	Positions	Russian	Emergency (EMS)	Accountancy	Gerontology
Social Science	San Bernardino	Political Science	Hubard Hall	Athletics	Statistics	McKnight Center	Marketing
South San Jose	Moreno Valley	Game Schedule	Fernadino Beach	Go Shockers	Award Documents	Council of Women	College Bylaws
Badlands Park	Altamonte Springs	South Addison	Council Bluffs	Degree Options	Language Center	Commute	Why Wichita?
Juvenile Justice	Peach Tree City	Cherry Hills Village	Classical Lit	Newsletter	Future Shockers	Small Business	Tickets
Results and Stats	Highland Park	Creative Writing	Sociology	Geology	Intercollegiate	Thinker & Movers	Career Services
Thousand Oaks	Manchesney Park	Lake Havasu City	Greek	Manufacturing	Bowling	Alumni	Doers & Shockers
Promotions	Vallecito Mts.	Engineering Bldg	Wallace Hall	Management	Wichita Gateway	Foundations	Core Values
North Palermo	Rock Falls	Sports Studies	Concert Tickets	UCATS	Transfer Day	Corbin Center	Grace Wilkie Hall
Credit Union	Freeport	Lakewood Village	Public Radio FM	Alumni News	Job Openings	Jardine Hall	Strategic Plan
Wilner Hall	Slaughter Beach	Rock Island	Children's Museum	Saso	Live Radio	Hugo Wall School	Medical Tech
Performing Arts	Rocky Mountains	Deerfield Beach	Writing Center	Educational Map	Beta Alpha Psi	Staff	Softball, Men's
Italian	Latin	Arlington Hill	Theater Auditions	Physical Plant	Liberal Arts	Aerospace	McKinley Hall
Coaches	Pleasant Hills	Preview Game	Delaware City	Graphic Design	Counseling	Choral Dept.	Email
McKees Rocks	Observatory	Richland Hills	Scholarships	Non Credit Class	Biological Science	Alberg Hall	Dental Hygiene
Glenwood Springs	Public Affairs	Experts Guide	Hendricksville	Media Relations	Duerksen Fine Art	French	Tenure
Urban Affairs	Heskett Center	Neff Hall	Knights Landing	Advertising	EMT Program	Spanish	Personnel Policies
McLeansboro	Brunswick	Grand Wash Cliffs	Modern Literature	English	Religion	Parents	Instrumental
Experimental Links	East Millinocket	Indian Well Valley	Studio Arts	Graduate Complex	Art Composition	Wrestling	Nursing
Graduation	Women's Studies	Online Courses	Hughes Complex	Music Education	Physics	Philosophy	Opera
Emory Lindquist	Vacant	Lindquist Hall	Cumberland Flats	Advising Center	Entrepreneurship	Wichita Lyceum	Sports History
Clinton Hall	News Theatre	Fisk Hall	Central Village	Medical School	Koch Arena	Fairmount Center	Athletic Dept.
San Luis Obispo	Candlewood Isle	Los Padres Forest	Hoffman Estates	Levitt Arena	Roster	Women's Museum	Health Plan

Are borders and white space better? Find French

Activity

Black Hills Forest	Peters Landing	Jefferson Farms	Devlin Hall
Cheyenne River	Public Health	Psychophysics	Positions
Social Science	San Bernardino	Political Science	Hubard Hall
South San Jose	Moreno Valley	Game Schedule	Fernadino Beach
Badlands Park	Altamonte Springs	South Addison	Council Bluffs
Juvenile Justice	Peach Tree City	Cherry Hills Village	Classical Lit
Results and Stats	Highland Park	Creative Writing	Sociology
Thousand Oaks	Manchesney Park	Lake Havasu City	Greek
Promotions	Vallecito Mts.	Engineering Bldg	Wallace Hall
North Palermo	Rock Falls	Sports Studies	Concert Tickets
Credit Union	Freeport	Lakewood Village	Public Radio FM
Wilner Hall	Slaughter Beach	Rock Island	Children's Museum
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Italian	Latin	Arlington Hill	Theater Auditions
Coaches	Pleasant Hills	Preview Game	Delaware City
McKees Rocks	Observatory	Richland Hills	Scholarships
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McLeansboro	Brunswick	Grand Wash Cliffs	Modern Literature
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Graduation	Women's Studies	Online Courses	Hughes Complex
Emory Lindquist	Vacant	Lindquist Hall	Cumberland Flats
Clinton Hall	News Theatre	Fisk Hall	Central Village
San Luis Obispo	Candlewood Isle	Los Padres Forest	Hoffman Estates
			Manufacturing
			Management
			UCATS
			Alumni News
			Saso
			Educational Map
			Physical Plant
			Graphic Design
			Non Credit Class
			Media Relations
			Advertising
			Beta Alpha Psi
			Liberal Arts
			Counseling
			Biological Science
			Duerksen Fine Art
			EMT Program
			Staff
			Aerospace
			Choral Dept.
			Alberg Hall
			French
			Spanish
			Softball, Men's
			McKinley Hall
			Email
			Dental Hygiene
			Tenure
			Personnel Policies
			English
			Graduate Complex
			Music Education
			Advising Center
			Medical School
			Levitt Arena
			Religion
			Art Composition
			Physics
			Entrepreneurship
			Koch Arena
			Roster
			Parents
			Wrestling
			Philosophy
			Wichita Lyceum
			Fairmount Center
			Women's Museum
			Instrumental
			Nursing
			Opera
			Sports History
			Athletic Dept.
			Health Plan



Weller (2004) found people took less time to locate items for information that was grouped

- Using a border (2nd screen) compared with using color contrast (1st screen)



Some argue that too much white space on web pages is detrimental to search process

- Makes it hard to find information



Do you agree?

Activity: Which is the easiest to read and why?

What is the time?

Design implications for perception

Icons should enable users to *distinguish* their meaning readily

Bordering and spacing are effective visual ways of grouping information

Sounds should be audible and distinguishable

Research proper color contrast techniques when designing an interface:

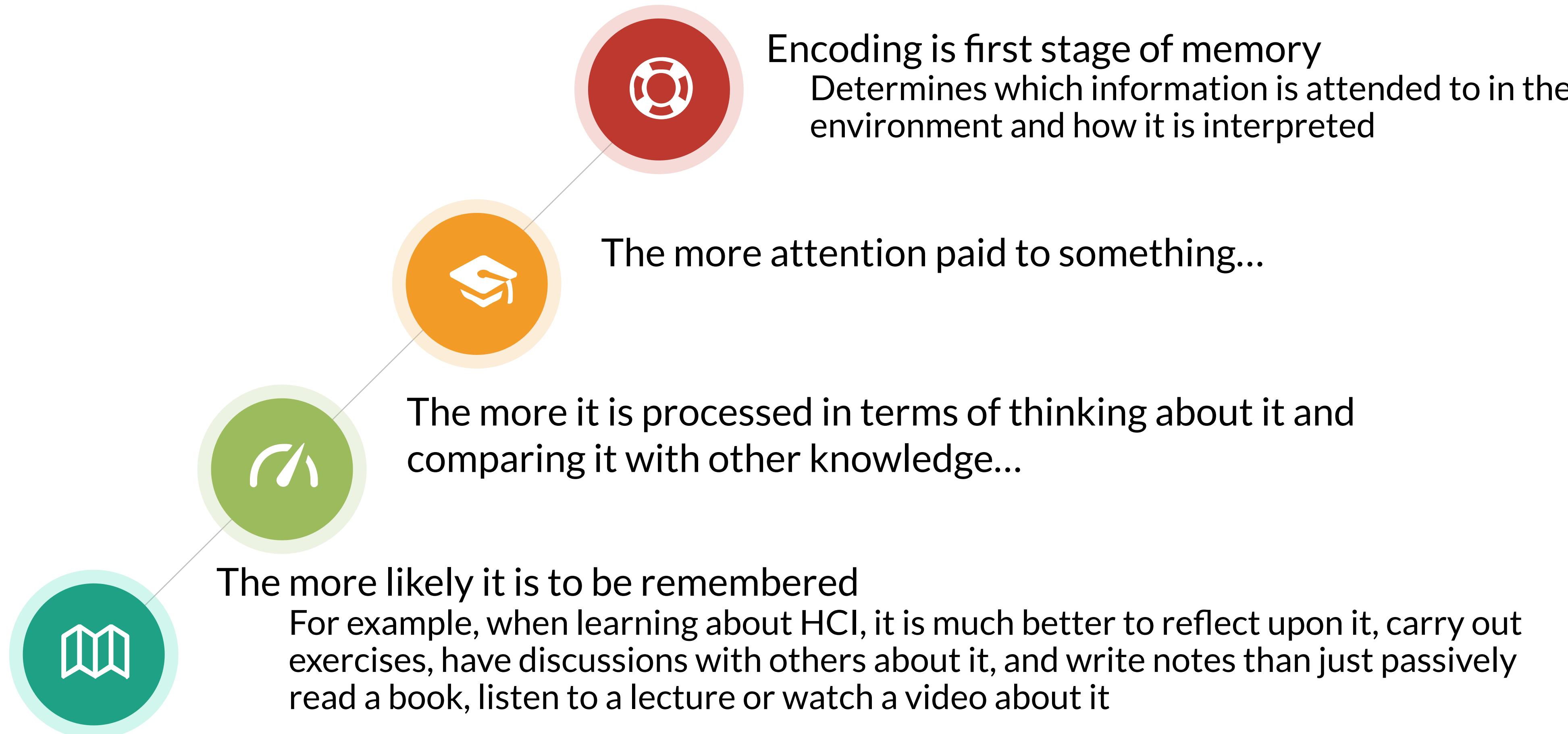
- Yellow on black or blue is fine
- Yellow on green or white is a no-no

Haptic feedback should be used judiciously

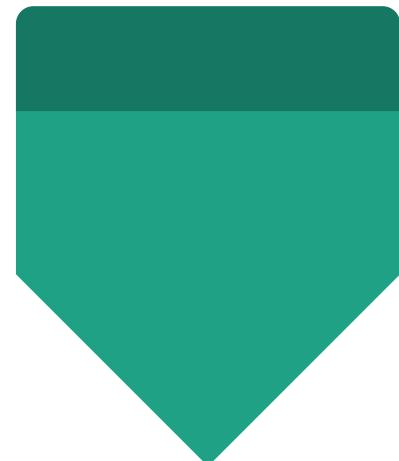
Memory

- Involves **recalling** various kinds of knowledge that allow people to **act appropriately**
 - For example, recognizing someone's face or remembering someone's name
- First **encode** and then **retrieve** knowledge
- We don't remember everything—it involves **filtering** and **processing** what is attended to
- Context is important as to how we **remember** (that is, where, when, how, and so on)
- We **recognize** things much **better** than being able to **recall** things
- We **remember less** about objects that we have **photographed** than when we **observe them with the naked eye** (Henkel, 2014)

Processing in Memory



Recognition versus recall



Command-based interfaces require users to recall from memory a name from a possible set of 100s of names



Graphical interfaces provide visually-based options (menus, icons) that users need only browse through until they recognize one



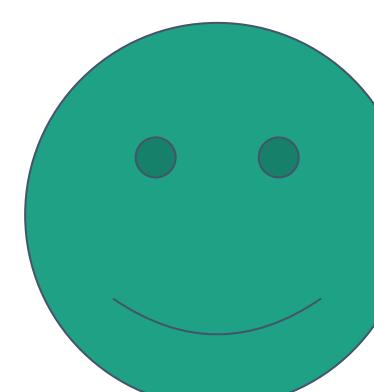
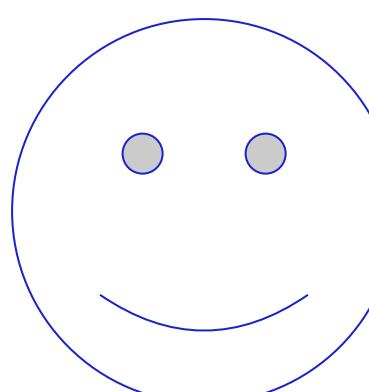
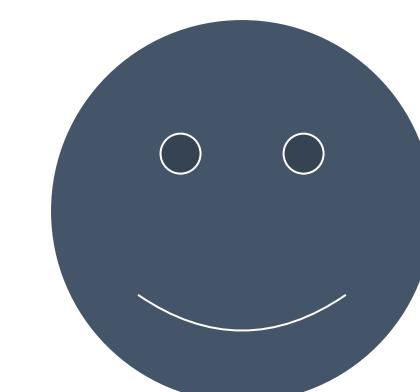
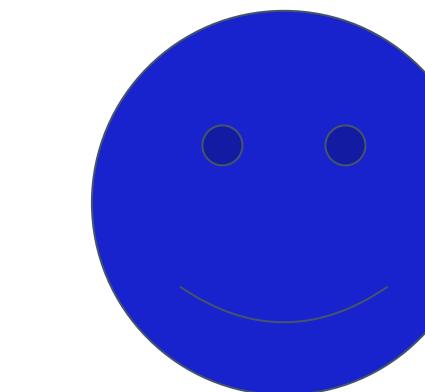
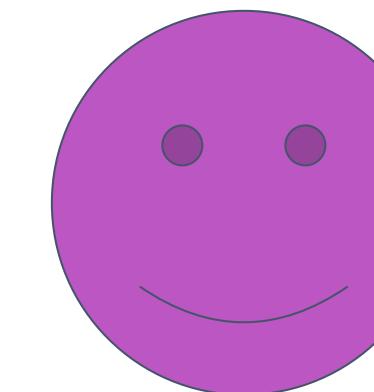
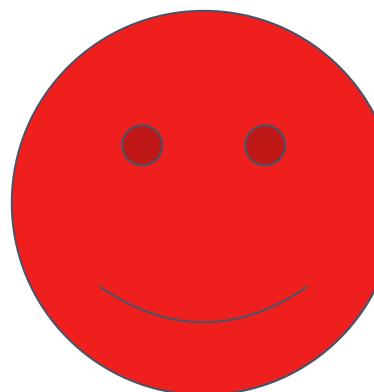
Web browsers provide tabs and history lists of visited URLs that support recognition memory

The problem with the classic '7,+ or - 2'

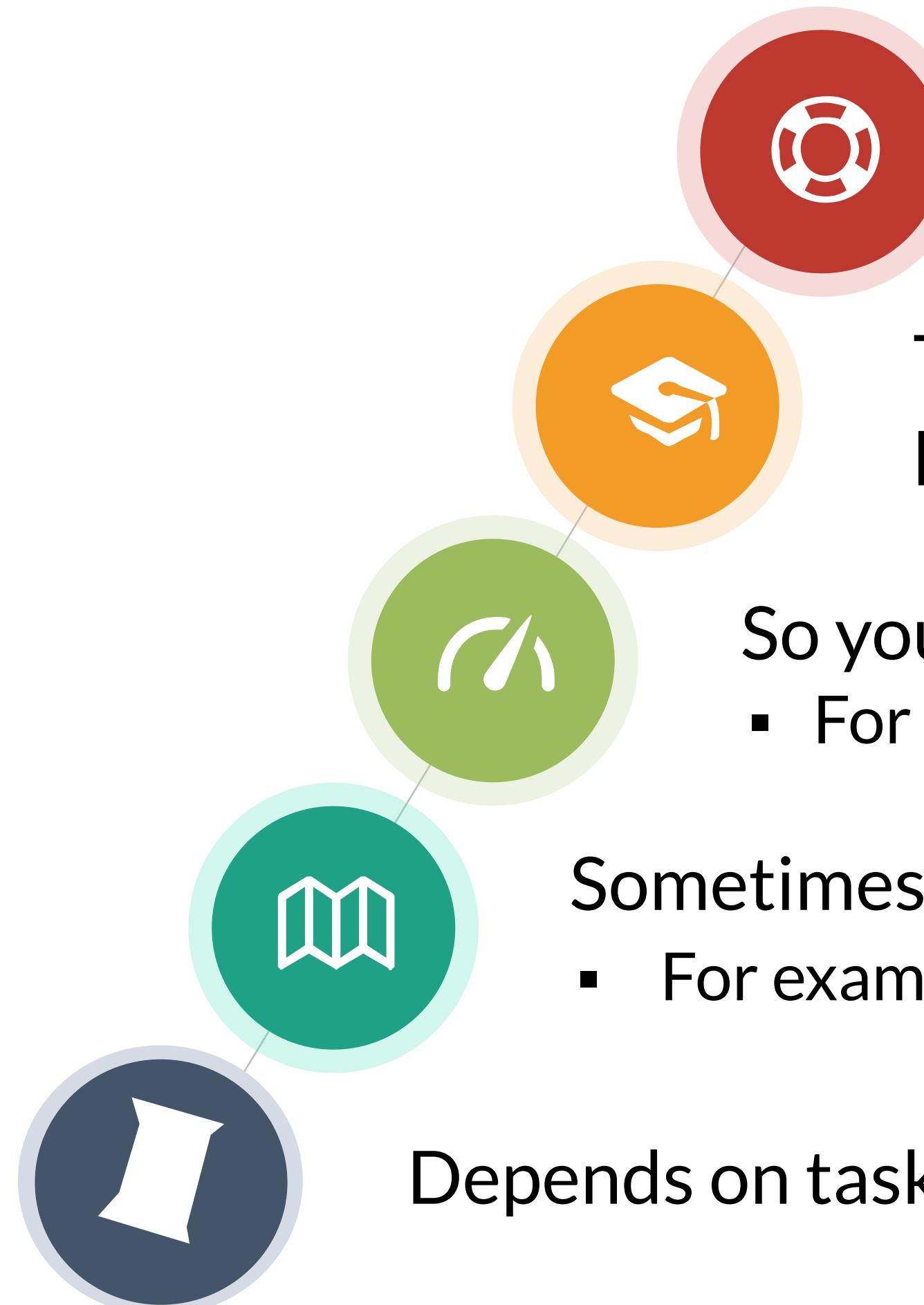
- George Miller's (1956) theory of how much information people can remember
- People's immediate memory capacity is very limited to 7, + or - 2
- Has been applied in interaction design when considering how many options to display
- But is it a good use of a theory in HCI?
- Is it helpful?

When creating an interface, should the designer...

- Present only 7 options on a menu
- Display only 7 icons on a tool bar
- Have no more than 7 bullets in a list
- Place only 7 items on a pull down menu
- Place only 7 tabs on the top of a website page
- Not necessarily...



The reason is...



People can scan lists of bullets, tabs, and menu items for the one they want

They don't have to recall them from memory, having only briefly heard or seen them

So you can have more than nine at the interface

- For instance, history lists of websites visited

Sometimes a small number of items is good

- For example, smart watch displays

Depends on task and available screen estate

Personal Information management

The design challenge here is deciding which is the best way of helping users organize their content so that it can be easily searched, for example, via folders, albums, or lists.

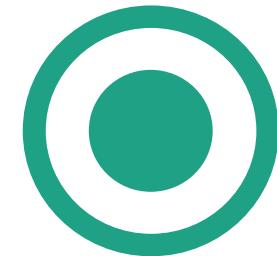
Is a growing problem for many users:

- They accumulate a vast numbers of documents, images, music files, video clips, emails, attachments, bookmarks, and so forth
- Where and how to save them all; then remembering what they were called and where to find them again
- Naming (files and folders) most common means of encoding them, but can be difficult to remember, especially when you have 10,000s

Personal Information management

- Bergman and Whittaker, three interdependent processes model (2016) to help people manage their stuff:
 - I. How to decide what stuff to keep
 - II. How to organize it when storing
 - III. Which strategies to use to retrieve it later
- Most common approach is to use folders and naming. Strong preference for scanning across and within folders when looking for something
- How might such a process be facilitated taking into account people's memory abilities?
- Smart search engines help with listing relevant files for partial name or when type in first letter

Memory Load



Online/mobile and phone banking now require users to provide multiple pieces of information to access their account

- For instance, ZIP code, birthplace, a memorable date, first school attended
- Known as multifactor authentication (MFA)



Why?

- Increased security concerns



Password managers, such as LastPass, have been developed that require only one master password

- Reduces stress and memory load on users



Passwords could become extinct with the widespread use of biometrics and computer vision algorithms

Digital Forgetting

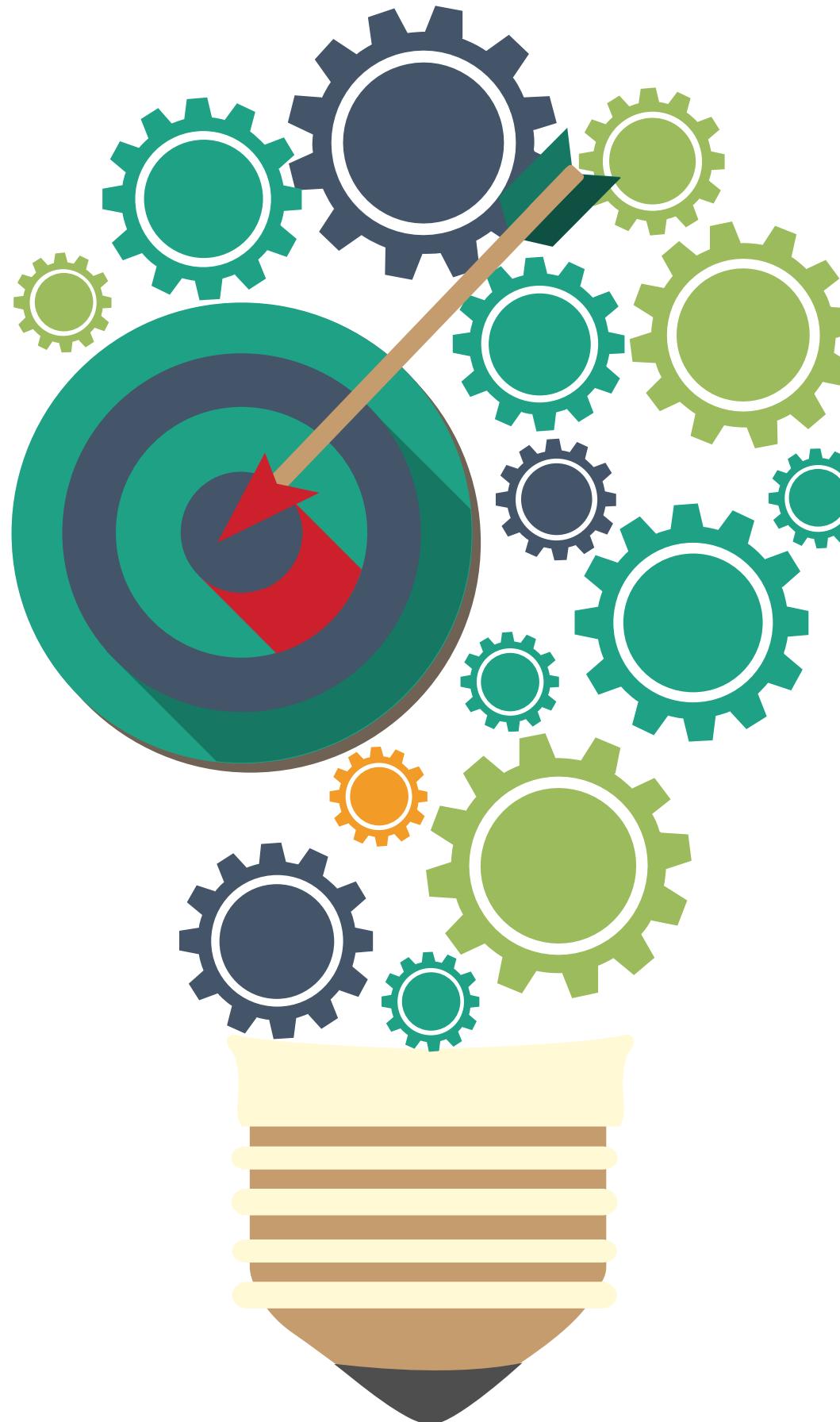
When might you wish to forget something that is online?

- When you break up with a partner
- Emotionally painful to be reminded of them through shared photos, social media, and so on.

Sas and Whittaker (2013) suggest ways of harvesting and deleting digital content

- For example, making photos of ex into an abstract collage
- Helps with closure

Memory Aids



SenseCam, developed by Microsoft Research Labs (now Autographer)

- A wearable device that intermittently takes photos without any user intervention while worn
- Digital images taken are stored and revisited using special software
- Has been found to improve people's memory, especially those suffering from dementia



Other aids include RemArc, which triggers long-term memory using old BBC materials

Design implications for memory

Reduce cognitive load by avoiding long and complicated procedures for carrying out tasks

Design interfaces that promote recognition rather than recall

Provide users with various ways of labelling digital information to help them easily identify it again

- For example, folders, categories, color, flagging, and time stamping

Learning



Involves the accumulation of skills and knowledge involving memory

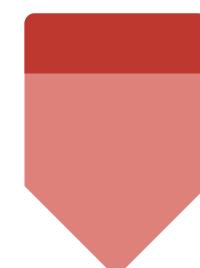


Two main types:

- Incidental learning (for example, recognizing people's faces, what you did today)
- Intentional learning (for instance, studying for an exam, learning to cook)
- Intentional learning is much harder!
- Many technologies have been developed to help (for example, multimedia, animations, VR)



People find it hard to learn by following instructions in a manual



People prefer to learn by doing

Design implications for learning

Design interfaces that encourage exploration

Design interfaces that constrain and guide learners

Dynamically linking concepts and representations can facilitate the learning of complex material

Reading, Speaking, and Listening

The ease with which people can read, listen, or speak differs:



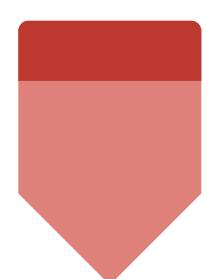
Many prefer listening to reading



Reading can be quicker than speaking or listening

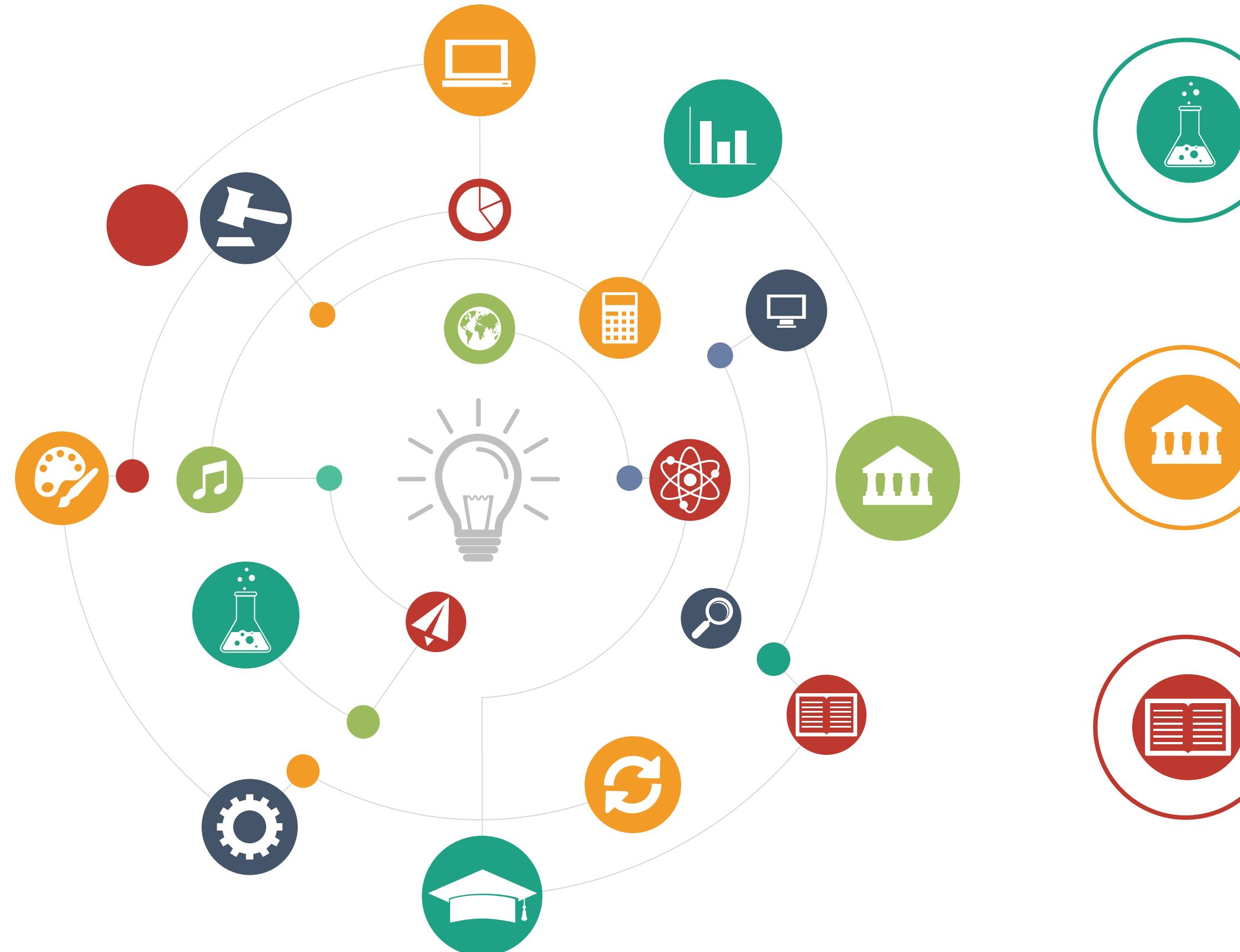


Listening requires less cognitive effort than reading or speaking



Dyslexics have difficulties understanding and recognizing written words

Application



Voice user interfaces allow users to interact with them by asking questions

- For example, Google Voice, Siri, and Alexa

Speech-output systems use artificially-generated speech

- For instance, written text-to-speech systems for the visually impaired

Natural-language systems enable users to type in questions and give text-based responses

- Such as, chatbots

Design implications for reading, speaking, and listening

- | Speech-based menus and instructions should be short
- | Accentuate the intonation of artificially generated speech voices
 - They are harder to understand than human voices
- | Provide opportunities for making text large on a screen

Problem-solving, planning, reasoning, and decision-making

All these processes involve *reflective cognition*

- For example, thinking about what to do, what the options are, and the consequences

Often involves conscious processes, discussion with others (or oneself), and the use of artifacts

- Such as maps, books, pen and paper

May involve working through different scenarios and deciding which is best option

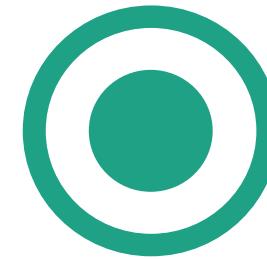
Weighing up alternatives

Design implications for problem-solving, planning, reasoning, and decision-making

Provide information and help pages that are easy to access for people who wish to understand more about how to carry out an activity more effectively (for example, web searching)

Use simple and memorable functions to support rapid decision-making and planning

Dilemma



The app mentality is making it worse for people to make their own decisions because they are becoming risk averse (Gardner and Davis, 2013)

- Instead, they now rely on a multitude of apps
- This makes them increasingly anxious
- They are unable to make decisions by themselves
- They need to resort to looking up info, getting other's opinions on social media, and comparing notes



Do you agree?



Did it happen to you when deciding which university/school to attend?

Cognitive frameworks



These are used to explain and predict user behavior at the interface

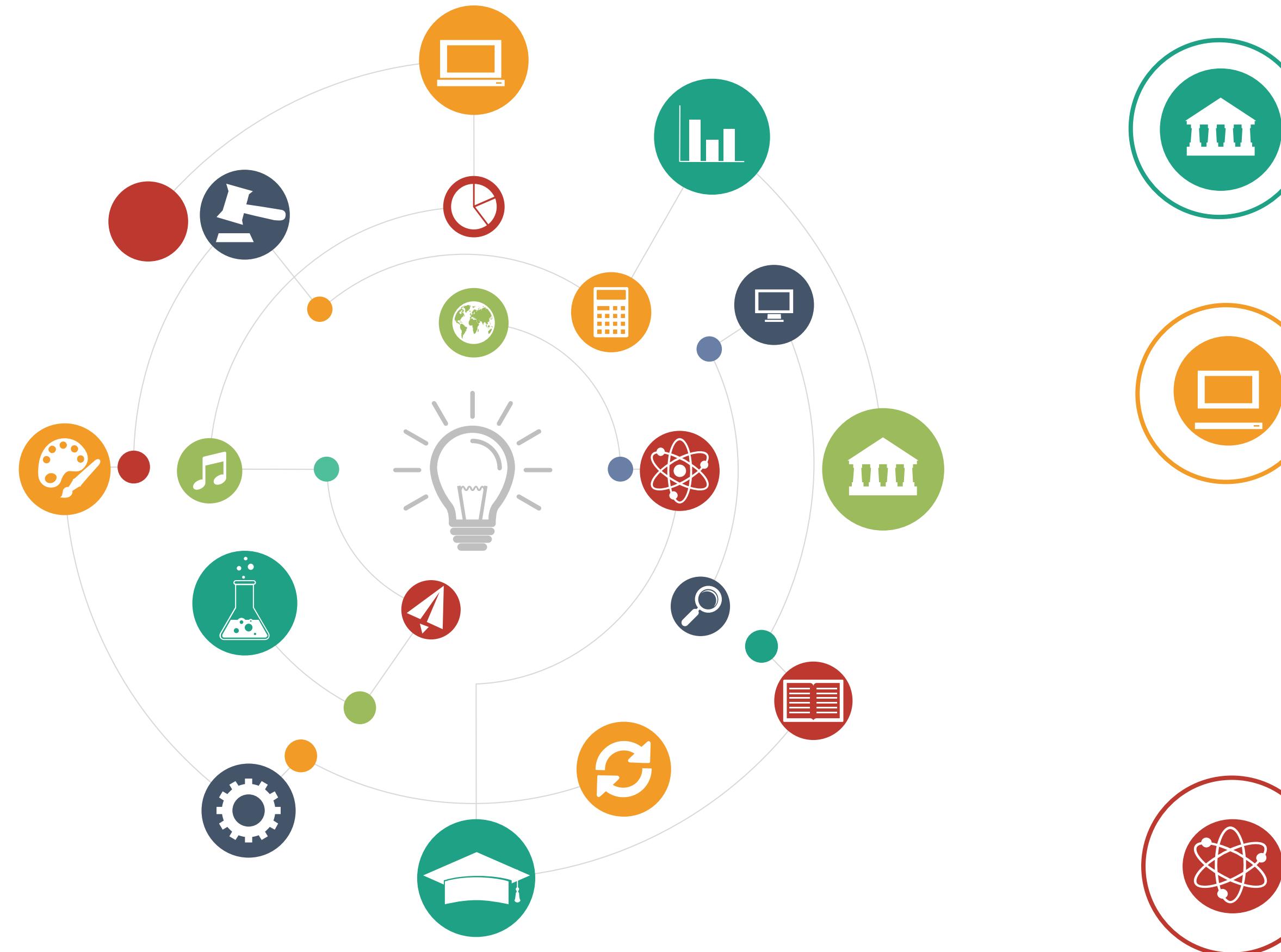
- Based on theories of behavior
- Focus is on mental processes that take place
- Also use of artifacts and representations



Most well known are:

- Mental models
- Gulfs of execution and evaluation
- Distributed cognition
- External and embodied cognition

Mental Models



- Users develop an understanding of a system through **learning about and using it**
- Knowledge is sometimes described as a **mental model**:
 - How to **use the system** (what to do next)
 - What to do with **unfamiliar** systems or **unexpected** situations (how the system works)
- People make inferences using **mental models** of how **to carry out tasks**

Everyday reasoning and mental models



You arrive home on a cold winter's night to a cold house.

How do you get the house to warm up as quickly as possible?

- Set the thermostat to be at its highest? or
- the desired temperature?



You arrive home starving hungry. You look in the fridge and find all that is left is an uncooked pizza. You have an electric oven

- Do you warm it up to 375 degrees first and then put it in (as specified by the instructions)? or
- turn the oven up higher to try to warm it up quicker?

How can UX be designed to help people build better mental models?

| Clear and easy to use instructions

| Appropriate tutorials and contextual sensitive guidance

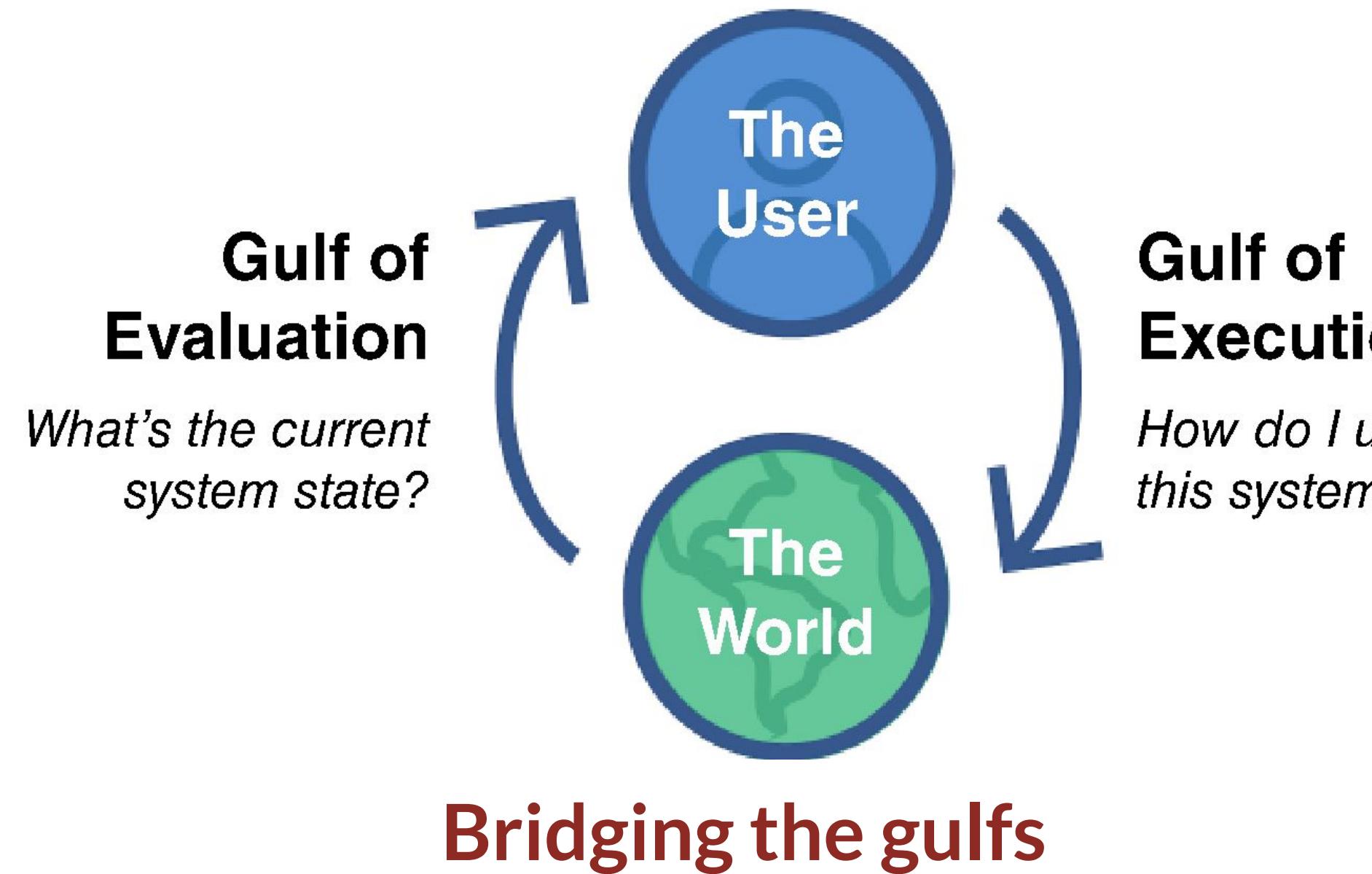
| Provide online videos and chatbot windows when needing help

| Transparency: to make interfaces intuitive to use

| Affordances of what actions an interface allows

- | For example, swiping, clicking, or selecting

Gulfs of execution and evaluation



The ‘gulfs’ explicate the gaps that exist between the user and the interface

The gulf of execution

- The distance from the user to the physical system

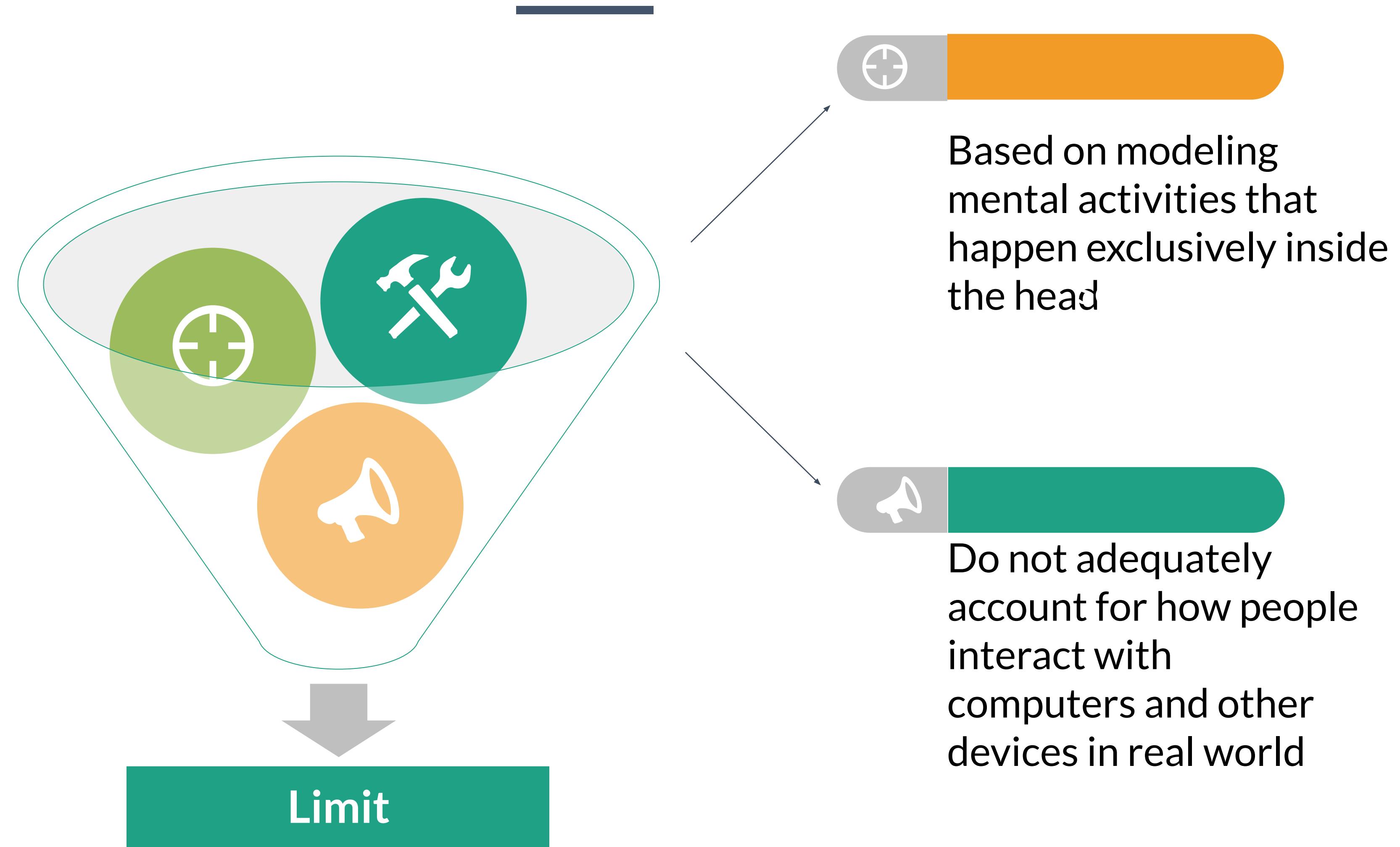
The gulf of evaluation

- The distance from the physical system to the user

Bridging the gulfs can reduce cognitive effort required to perform tasks

Can reveal whether interface increases or decreases cognitive load and whether it is obvious what to do next (Norman, 1986; Hutchins et al, 1986)

Limitations



Distributed cognition

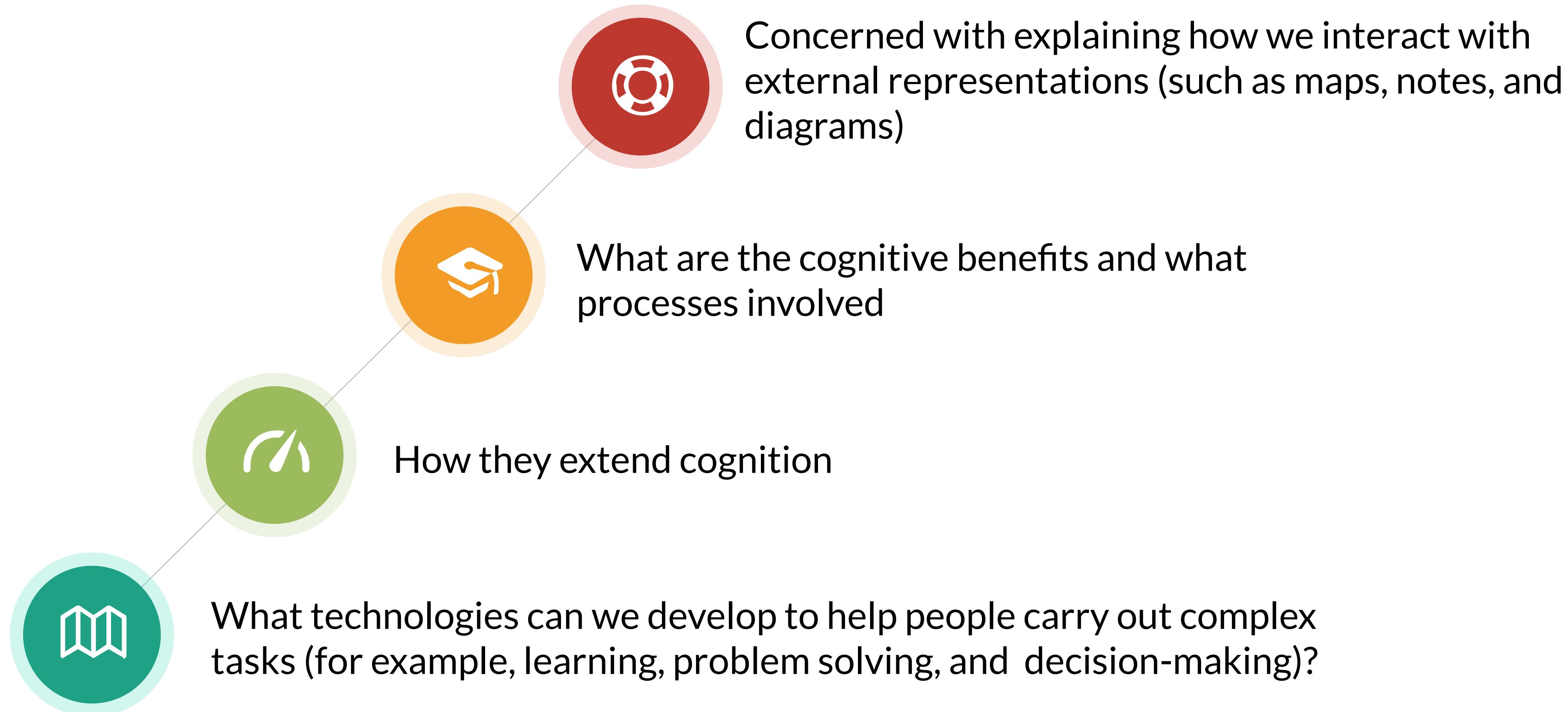


Concerned with the nature of cognitive phenomena across individuals, artifacts, and internal and external representations (Hutchins, 1995)

Describes these in terms of propagation across representational state

Information is transformed through different media (computers, displays, paper, heads)

External cognition



Externalizing to reduce memory load



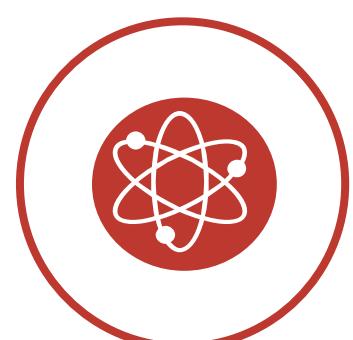
Examples include the use of diaries, reminders, calendars, notes, shopping lists, to-do lists

- Written to remind us of what to do



Post-its, piles, marked emails are used to:

- Where placed indicates priority of what to do



External representations:

- Remind us that we need to do something (for example, to buy something for mother's day)
- Remind us of what to do (for instance, buy a card)
- Remind us when to do something (for example, send a card by a certain date)

Computational offloading



When a tool is used in conjunction with an external representation to carry out a computation (for instance, pen and paper)



Try doing the two sums below (a) in your head, (b) on a piece of paper, and (c) with a calculator.

$$234 \times 456 = ??$$

$$\text{CCXXXIIII} \times \text{CCCCXXXXVI} = ???$$



Which is easiest and why? Both are identical sums

Annotation and cognitive tracing



Annotation involves modifying existing representations through making marks

- For example, crossing off, ticking, and underlining



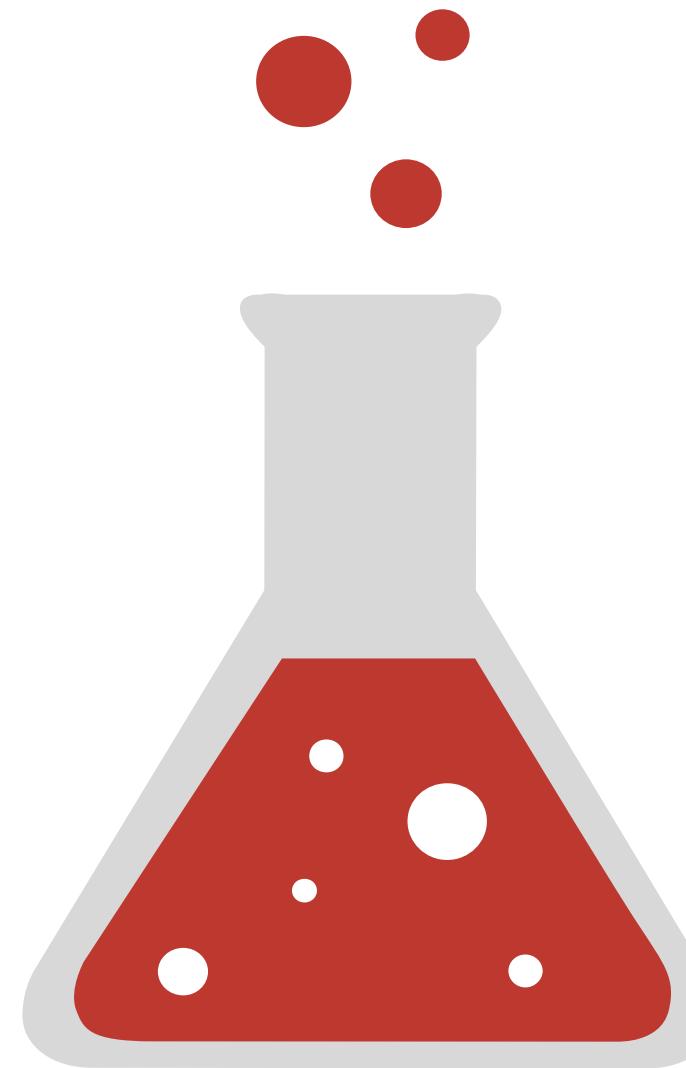
Cognitive tracing involves externally manipulating items into different orders or structures

- For instance, playing Scrabble or cards

Design implication

Provide external representations at the interface
that can reduce memory load and facilitate
computational offloading

- For example, information visualizations have been designed to allow people to make sense and rapid decisions about masses of data



*Creativity is the key to success
in the great education*

Terima Kasih

User Research: Discovering Requirements

—

IF3151 Human Computer Interaction

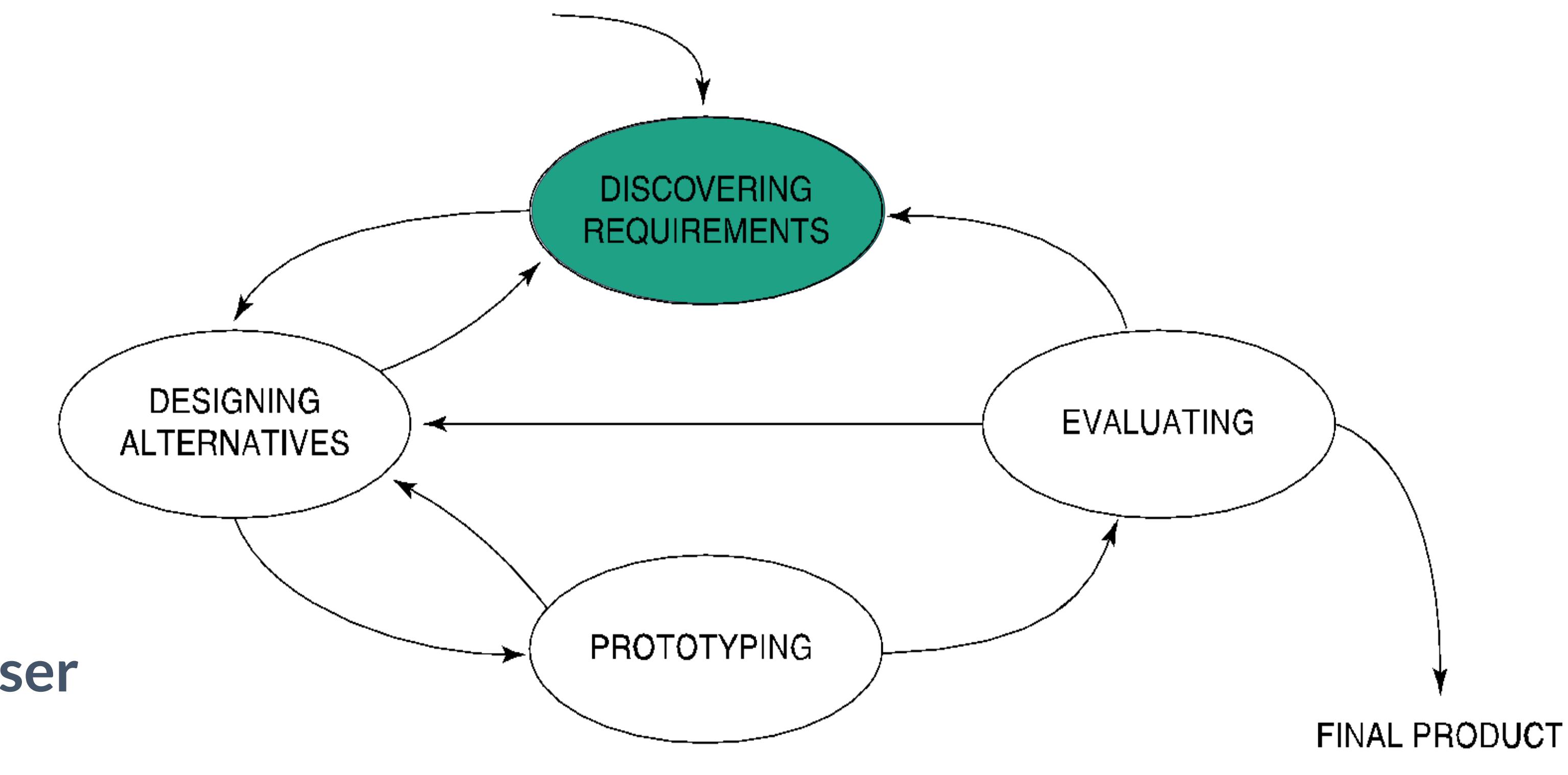
K1 Dessi Puji Lestari / Lenny Putri Yulianti

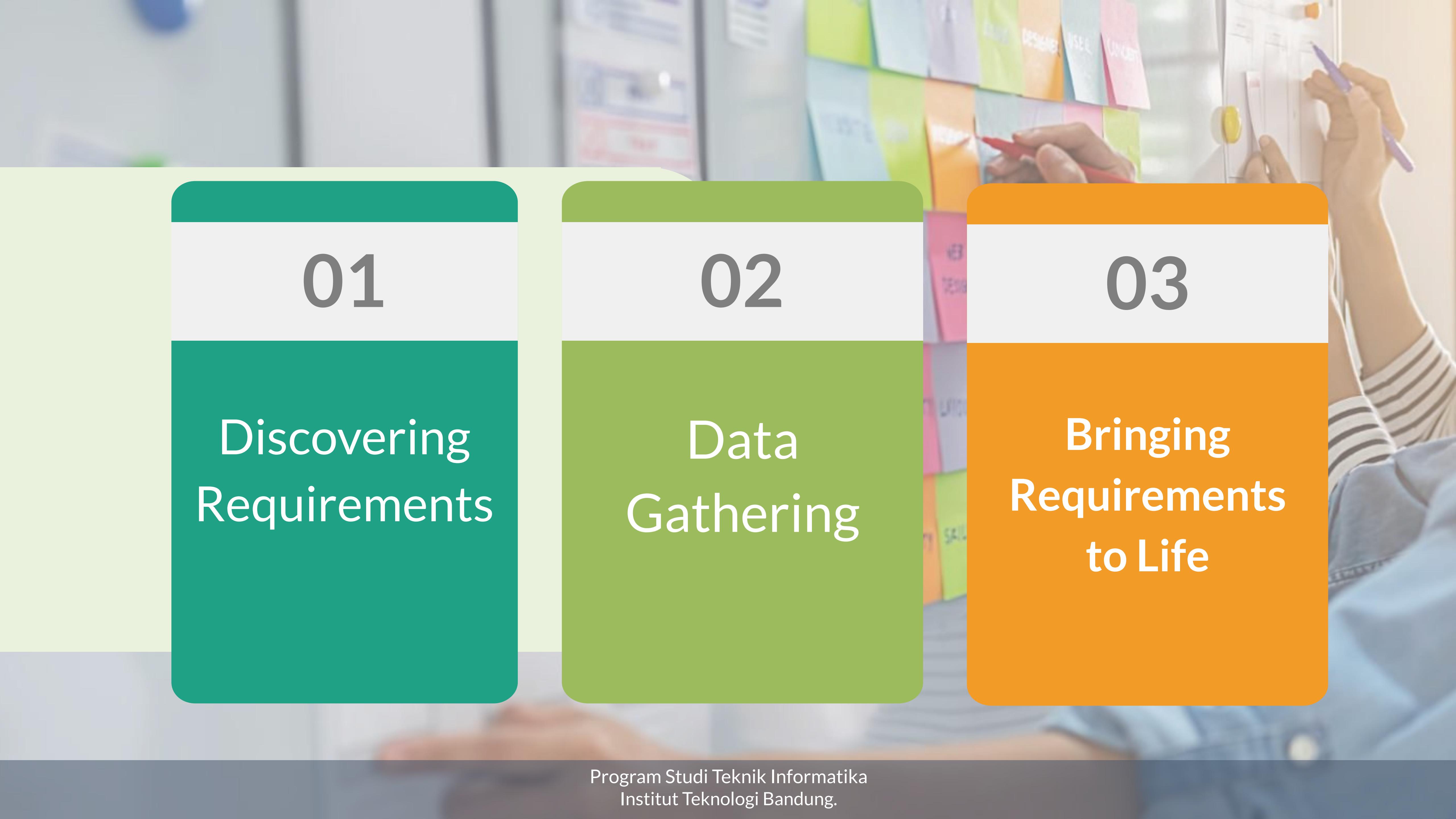
K2 Fitra Arifiansyah

K3 Adi Mulyanto / Maya Nabila

Basic Activities of Interaction Design

- 0 Discovering requirements
- 1 Designing alternatives
- 2 Prototyping alternative designs
- 3 Evaluating product and its user experience throughout
- 4



A blurred background image shows a person's hands writing on a whiteboard. The whiteboard is covered with numerous colorful sticky notes of various colors (yellow, green, pink, blue) containing handwritten text. The overall atmosphere suggests a collaborative workspace or a planning session.

01

Discovering
Requirements

02

Data
Gathering

03

Bringing
Requirements
to Life

01

Discovering Requirements

What, how, and why?

1

What is the purpose of the requirements activity

- Explore the problem space
- Knowing what will be developed

2

How to capture requirements

There are many mechanisms: observation, research, etc

3

Why it is needed

Requirements activity is the stage where miscommunication occurs

What are requirements

A statement about an intended product
that specifies what it is expected to do or
how it will perform

User Stories

- | an approach in software development that focuses on the user perspective.
- | Short statements that describe desired requirements or features from the user's point of view.
- | Help the development team better understand the goals and needs of end-users and keep the focus on the UX.

User Stories: Elements and Format

Elements:

- Who
- What
- Why

Format:

As a <role>, I want <behavior> so that <benefit>

User Stories Example (1)

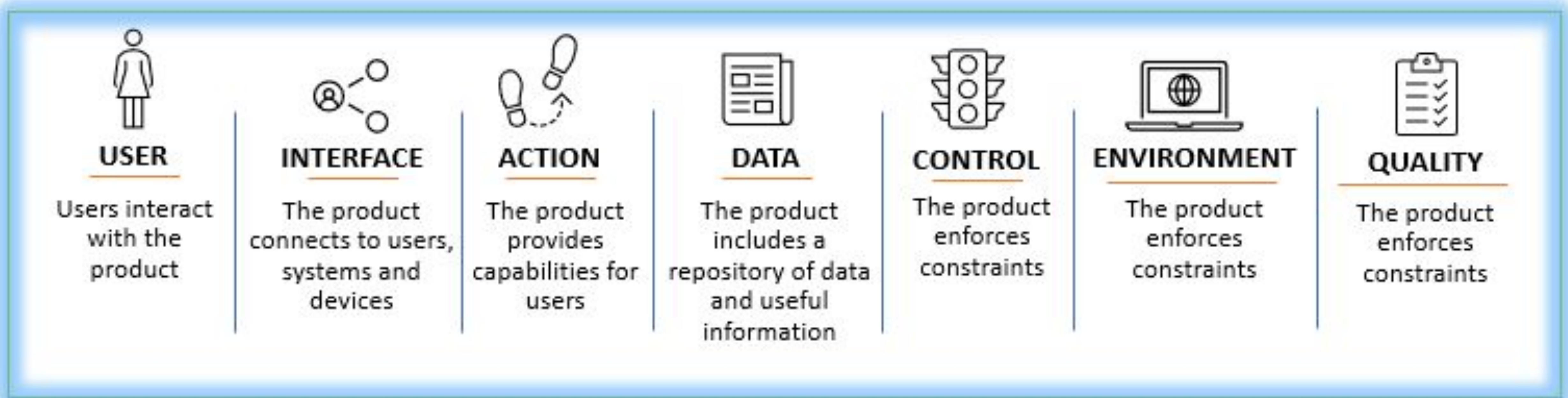
As a <traveler>,
I want
<to save my favorite airline for all my flights>
so that
<I will be able to collect air miles>

User Stories Example (2)

As a <travel agent>,
I want <my special discount rates to be displayed to me>
so that
<I can offer my clients competitive rates>

The Seven Product Dimension

(agile)



Source: Gottesdiener and Gorman (2012), Discover to Deliver: Agile Product Planning and Analysis

Different Kinds of Requirements (1)

Functional

- What the system should do

Data

- What kinds of data need to be stored?
- How will they be stored (for example, database)?

Different Kinds of Requirements (2)

Environment or context of use

- **Physical:** dusty? noisy? vibration? light? heat?
- **Social:** data sharing, collaboration, synchronous, privacy
- **Organizational:** user support, communications structure and infrastructure, availability of training
- **Technical:** on what technologies will it run or need to be compatible?

Different kinds of requirements (3)

User – who they are

- Characteristics: educational background, nationality, etc
- System use: novice, expert, casual, frequent
- User profile

Usability and User Experience Goals

Different products have different requirements and may be implemented in different ways

How to discover the user requirements?



User
Research

What is research?

| Asking more and better questions

| Thinking critically about the answers

User Research

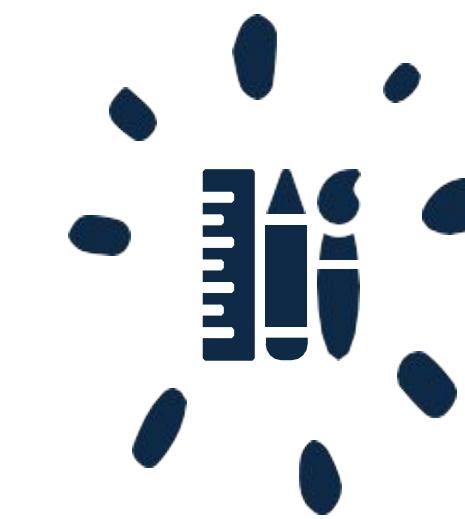
Helps place people at the center of your design process and your products



INSPIRE
design



EVALUATE
solutions



MEASURE
impact

Dimensions

Attitudinal
what people say

Behavioral
what people do

VS.

Qualitative
more effective at
revealing why

Quantitative
showing what is
happening and can
reveal a degree of how

A Landscape of User Research Methods

BEHAVIORAL



Field Studies
Contextual Inquiry

ATTITUDINAL

Concept Testing
Diary Studies
Participatory Design
Card Sorting / Tree Testing
Focus Groups
Customer Feedback
Interviews
Desirability Studies

Surveys

QUALITATIVE (DIRECT)

© 2022 Christian Rohrer

QUANTITATIVE (INDIRECT)

KEY FOR CONTEXT OF PRODUCT USE DURING DATA COLLECTION

<https://www.nngroup.com/articles/which-ux-research-methods/>

- Natural use of product ■ Scripted use of product ▲ Decontextualized (not using product)
- ◆ Limited (use of a limited form of the product to study a specific aspect of the user experience)

When to use which
user-experience research
methods

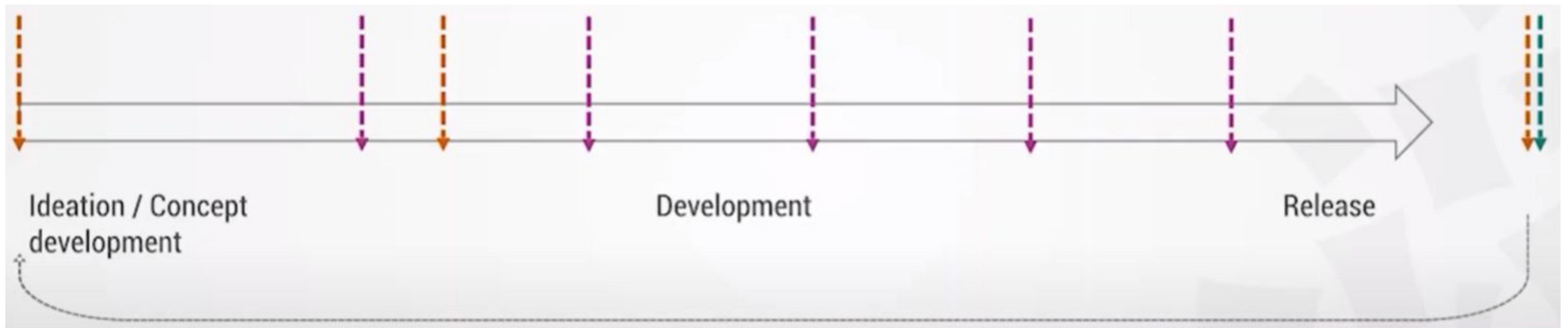
nngroup.com



<https://youtu.be/OtUWbsvCujM>

When to do user research

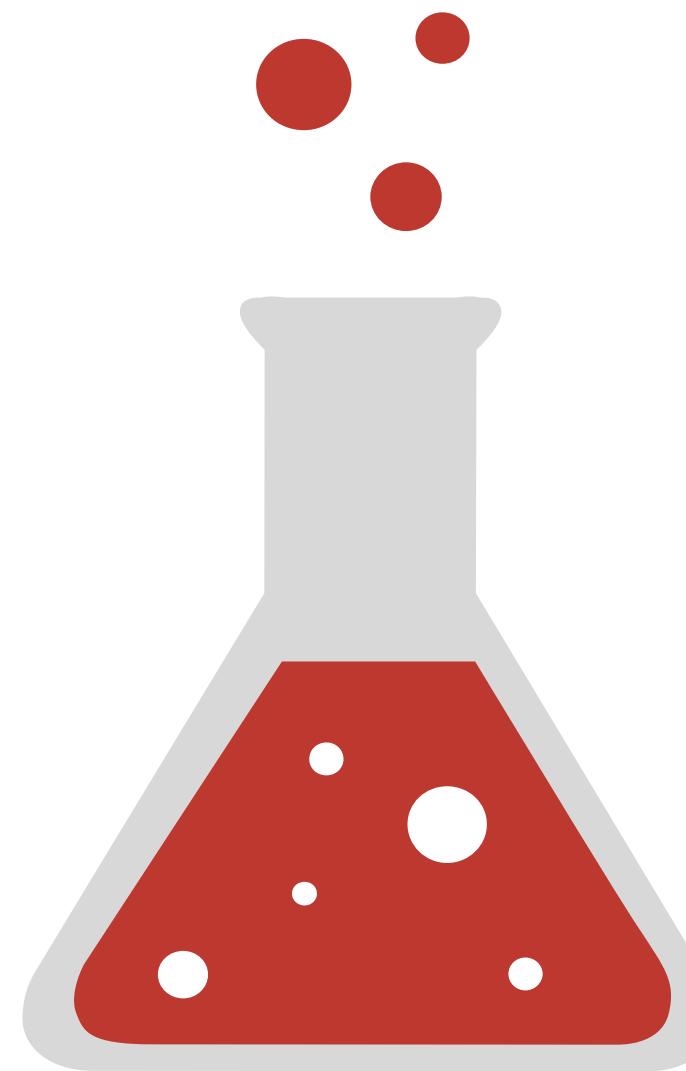
Depends on why you are doing user research



Research to ensure that your design are truly relevant

Research to ensure that your design is pleasant and easy to use

Research to understand return on investment of your user experience (UX) design



*Creativity is the key to success
in the great education*

Terima Kasih

User Research: Data Gathering and Bringing Requirement to Life

IF3151 Human Computer Interaction

K1 Dessi Puji Lestari / Lenny Putri Yulianti

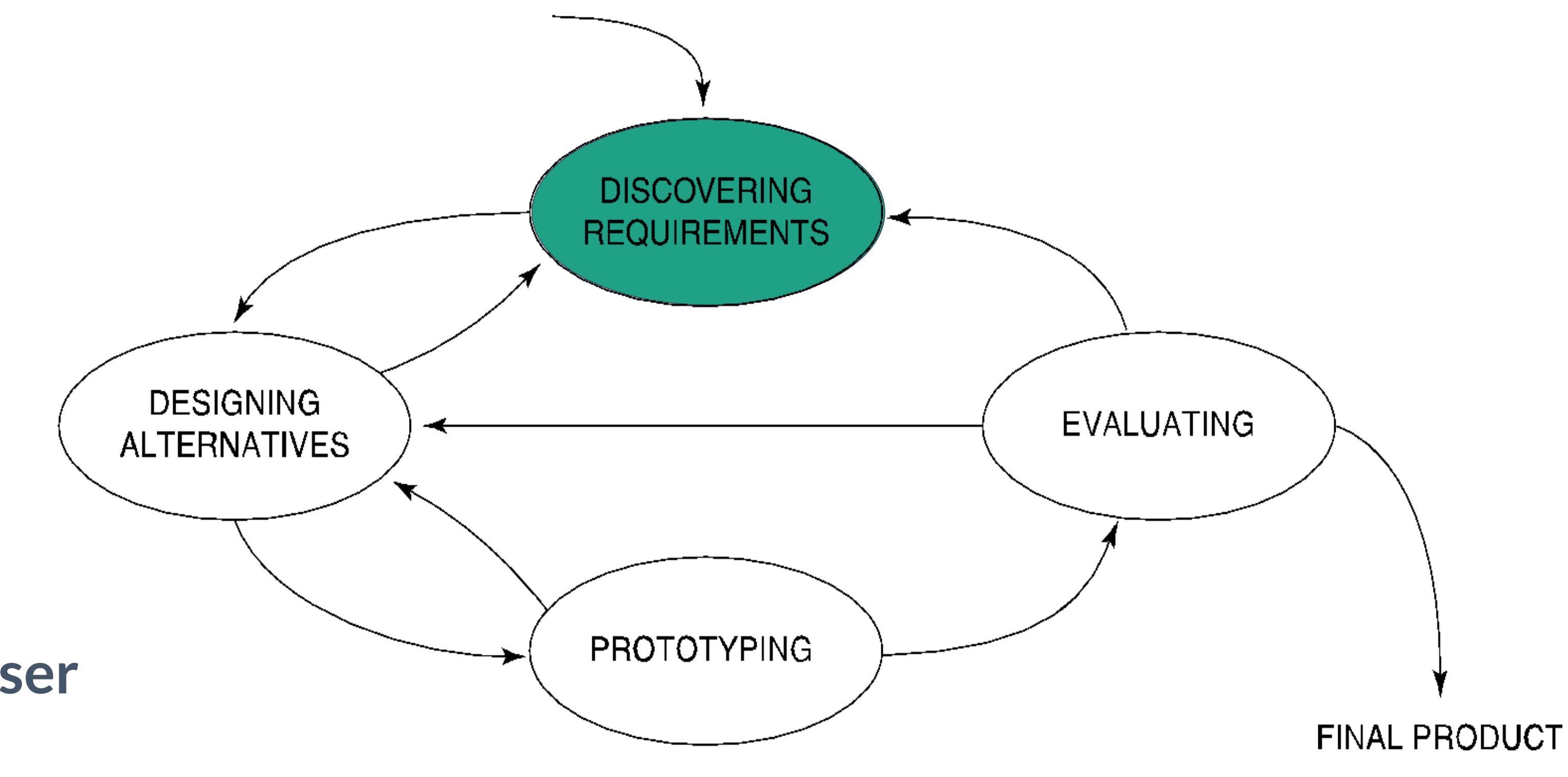
K2 Fitra Arifiansyah

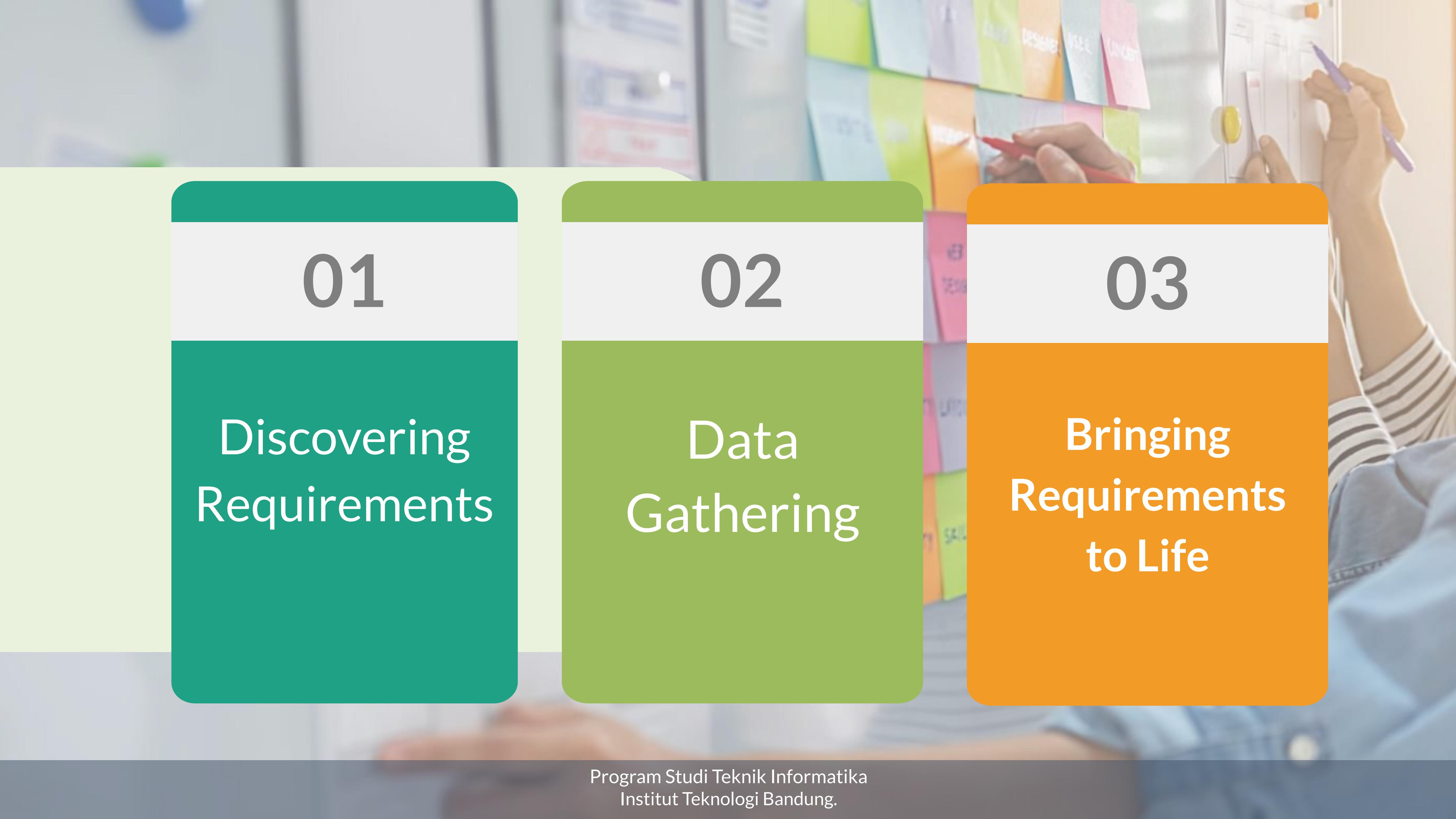
K3 Adi Mulyanto / Maya Nabila



Basic Activities of Interaction Design

- 0 Discovering requirements
- 1 Designing alternatives
- 2 Prototyping alternative designs
- 3 Evaluating product and its user experience throughout
- 4



A blurred background image shows a person's hands writing on a whiteboard. The whiteboard is covered with numerous colorful sticky notes of various colors (yellow, green, pink, blue) containing handwritten text. The overall atmosphere suggests a collaborative workspace or a planning session.

01

Discovering
Requirements

02

Data
Gathering

03

Bringing
Requirements
to Life

02

Data Gathering

Five Key Issues

1

Setting Goals

Decide how to analyze data once collected

→ target analisis
datanya apa

2

Identifying Participants

Decide from whom to gather data;
How many participants are needed

→ target partisipannya siapa

3

Relationship with participants

Clear and professional;
Informed consent when appropriate

→ harus cari responden profesional
(selain teman & keluarga)

4

Triangulation

Look at data from more than one perspective;
Collect more than one type of data, e.g: quantitative data from experiments and qualitative data from interviews

→ pake metode buat kumpulin
datanya jgn cuma satu

5

Pilot Studies

Small trial of main study

→ jgn gunakan responden yg diawal
utk respon di akhir

→ intinya responden awal ≠ responden akhir

Data Recording

Notes, audio, video, and photographs can be used individually or in combination:

Notes plus photographs

Audio plus photographs

Video

Different challenges and advantages with each type of data recording

Methods

01

Interviews

02

Questionnaires

03

Observation

0 Interviews

1

Type of Interviews

- **Unstructured:**

- Not directed by a script. *PALING JELOK !!*
- Rich but not replicable.

- **Structured:**

- Tightly scripted, often like a questionnaire.
- Replicable but may lack richness.

- pertanyaan ga dirancang,
berdasarkan flow saja

- Uda bikin list pertanyaan &
ga akan nanya hal di luar list

- **Semi-structured:**

- Guided by a script, but interesting issues can be explored in more depth.
- Can provide a good balance between richness and replicability.

- **Focus groups:** A group interview

buat cari interaksi antar 2 phak

0 Interview

1 —

Interviews Questions

Two types:

- ‘Closed questions’ have a predetermined answer format, for example, ‘yes’ or ‘no’
 - Closed questions are easier to analyze
- ‘Open questions’ do not have a predetermined format

jawaban nya kaya choice gitu jd eng gabakal dpt info banyak

bisa dapat banyak informasi

0 Interview

1 —

Interviews Questions

Avoid:

- Long questions → pecah² aja pertanyaannya
- Compound sentences – split them into two
- Jargon and language that the interviewee may not understand → pake bahasa yg mudah dimengerti
- Leading questions that make assumptions, for example, why do you like ...? → objektif, jan lsg arrange ke topik yg kita mau
- Unconscious biases, for instance, gender stereotypes

intinya tidak boleh menyinggung

0 Interview

1 —

Running the Interview

1. Introduction

Introduce yourself, explain the goals of the interview, reassure about the ethical issues, ask to record, and present the informed consent form.

2. Warm-up

Make first questions easy and non-threatening.

3. Main body

Present questions in a logical order

4. A cool-off period

Include a few easy questions to defuse tension at the end

kalo miral udah kelar, hr
ditutup sm pertanyaan = mudah
blar narrum ga pusing

5. Closure

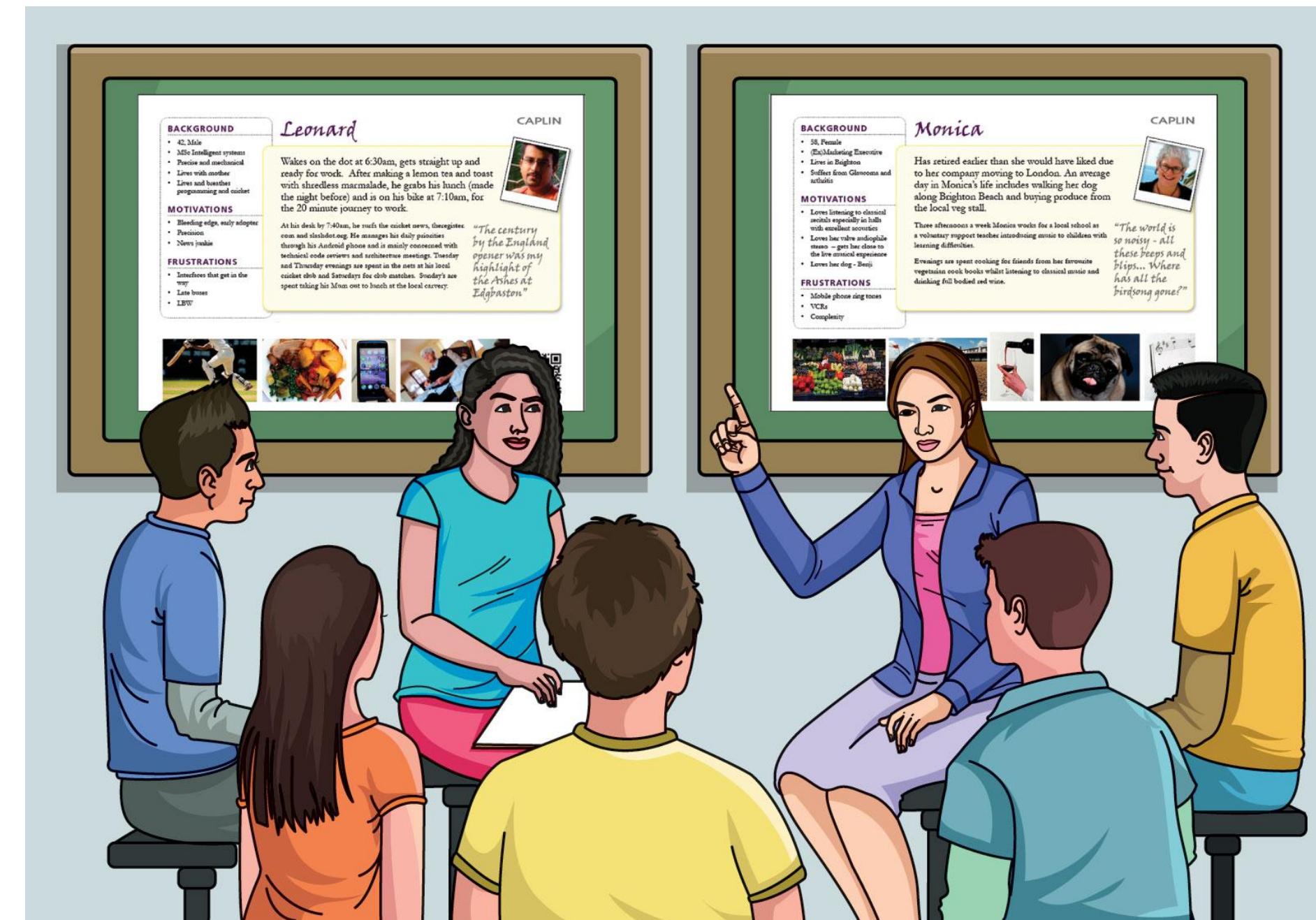
Thank interviewee, signal the end, for example, switch recorder off.

HARUS TULUS!

Enriching the Interview Process

Using Props: Devices for prompting interviewee

For example: use a prototype, scenario



Pros and Cons

0 Interviews

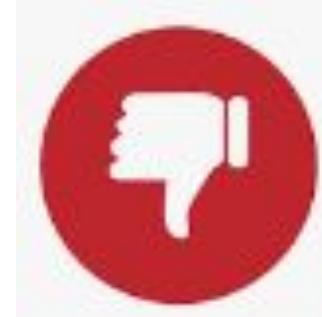
buat dapet insight lebih banyak & mendalam
buat user yg ribut mending pake interview

1 Pros



- Great way to start collecting data
- Explains why
- Can be done in many ways
- Easily combined with other techniques
- Usually inexpensive

Cons



- Data harder to quantify
- Result might not generalize (because of small samples)
- Hard to draw conclusion about population

Characteristics

0 Questionnaires

→ kalau targetnya punya waktu lebih banyak
kalau mau JUMLAH jawaban banyak
biasanya kombinasi closed and open question

2 Questions can be closed or open

- Closed questions are easier to analyze, and may be distributed and analyzed by computer
- Can be administered to large populations
- Disseminated by paper, email and the web
- Sampling can be a problem when the size of a population is unknown as is common online evaluation

Sample Size

0 Questionnaires

2

Sample Size?

How many survey participants do I need if there are ~500,000 riders in Jakarta?

Confidence Level	Confidence Interval (in %)	Population	Sample Needed
95%	5	>223.000	384
95%	3	>480.000	600
95%	1	>800.000	1,065
99%	5	>400.000	665
99%	3	>900.000	1,846
99%	1	>1.000.000	16,369

→ ada target responen;
pakai metode sampling yg tepat
biar valid utk mewakili populasi

Population Size	Margin of Error			
	5.0%	3.5%	2.5%	1.0%
10	10	10	10	10
20	19	20	20	20
30	28	29	29	30
50	44	47	48	50
75	63	69	72	74
100	80	89	94	99
150	108	126	137	148
200	132	160	177	196
250	152	190	215	244
300	169	217	251	291
400	196	265	318	384
500	217	306	377	475
600	234	340	432	565
700	248	370	481	653
800	260	396	526	739
1,000	278	440	606	906
1,200	291	474	674	1067
1,500	306	515	759	1297
2,000	322	563	869	1655
2,500	333	597	952	1984
3,500	346	641	1068	2565
5,000	357	678	1288	
7,500	365	710	1275	4211
10,000	370	727	1332	4899
25,000	378	780	1448	6939
50,000	381	772	1491	8056
75,000	382	776	1506	8514
100,000	383	778	1513	8762
250,000	384	782	1527	9248
500,000	384	783	1532	9423
1,000,000	384	783	1534	9512
2,500,000	384	784	1536	9567
10,000,000	384	784	1536	9594
100,000,000	384	784	1537	9603
300,000,000	384	784	1537	9603

Questionnaire Design

0 Questionnaires

urutan & cara pertanyaan berpengaruh

2

- Provide clear instructions on how to complete the questionnaire.
- Avoid very long questions and questionnaires
- The impact of a question can be influenced by question order.
- Decide on whether phrases will all be positive, all negative, or mixed.
- Strike a balance between using white space and keeping the questionnaire compact.
- You may need different versions of the questionnaire for different populations.

Question and Response Format

0 Questionnaires

2

- 'Yes' and 'No' checkboxes
- Checkboxes that offer many options
- Rating scales

Likert scales

Semantic scales

3, 5, 7 or more points

- Open-ended responses

Encouraging a Good Response

0 Questionnaires

2

- Make sure that the purpose of study is clear
- Promise anonymity
- Ensure that questionnaire is well designed
- Offer a short version for those who do not have time to complete a long questionnaire
- If mailed, include a stamped, addressed envelope
- Follow-up with emails, phone calls, or letters
- Provide an incentive

Deploying Online Questionnaires

0 Questionnaires

2

1. Plan the timeline
2. Design the questionnaire
3. Test the survey to make sure that it behaves as you would expect
4. Test it with a group that will not be part of the survey to check that the questions are clear
5. Recruit participants

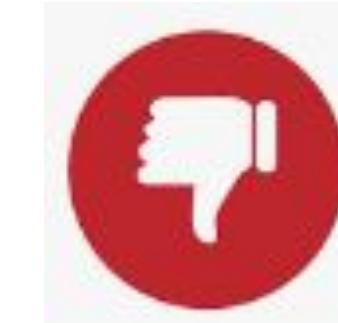
Pros and Cons Online Questionnaires

0 Questionnaires



Pros

- Easy and quick to distribute
- Responses are usually received quickly
- Can be collected in database for analysis
- Time required for data analysis is reduced
- Errors can be corrected easily



Cons

- Sampling is problematic if population size is unknown
- Preventing individuals from responding more than once can be a problem

Type of Observation

0 Observation

1. Direct observation in the field

- Structuring frameworks
- Degree of participation (insider or outsider)
- Ethnography

2. Direct observation in controlled environments^{3.}

3. Indirect observation: tracking users' activities

- Diaries
- Interaction logging
- Video and photographs collected remotely by drones or other equipment

Example of Direct Observation

0 Observation

3



Mars Exploration Rover

Source: Reproduced by permission of NASA Jet Propulsion Laboratory (NASA-JPL)

Structuring Frameworks to Guide Observation

0 Observation

Three easy-to-remember parts:

- The person: Who?
- The place: Where?
- The thing: What?

0 Observation

A  more detailed framework (Robson, 2014):

- Space : What is the physical space like and how is it laid out?
- Actors : What are the names and relevant details of the people involved?
- Activities : What are the actors doing and why?
- Objects : What physical objects are present, such as furniture
- Acts : What are specific individual actions?
- Events : Is what you observe part of a special event?
- Time : What is the sequence of events?
- Goals : What are the actors trying to accomplish?
- Feelings : What is the mood of the group and of individuals?

Planning and Conducting Observation in the Field

0 Observation

- **Decide on how involved you will be: passive observer or active participant**
- How to gain acceptance
- How to handle sensitive topics, e.g: culture, private spaces
- How to collect the data:
 - o What data to collect
 - o What equipment to use
 - o When to stop observing

Type of Observation

0 Observation

1. Direct observation

Think aloud techniques

1. Indirect observation – tracking users' activities

- Diaries
- Interaction logs
- Web analytics

Video, audio, photos, and notes are used to capture data in both types of observations

Ethnography

- Analyzing video and data logs can be time-consuming
- Ethnography is a philosophy with a set of techniques that include participant observation and interviews
 - Ethnographers immerse themselves in the culture that they study
 - A researcher's degree of participation can vary
 - Collections of comments, incidents, and artifacts are made

More on Ethnography (continued)



- (a) The situation before MERboard;
- (b) a scientist using MERboard to present information

Source: J. Trimble, R. Wales and R. Gossweiler (2002): "NASA position paper for the CSCW 2002 workshop on Public, Community and Situated Displays MERBoard."

Choosing and Combining Techniques

Depends on the:

- Focus of the study
- Participants involved
- Nature of the technique(s)
- Resources available
- Time available

03

Bringing Requirements to Life

Bringin Requirement to Life

↪ harus tau siapa target user

Create Personas

bangun persona dari user

Create Task Description

- Scenario
- Use Case

Personas

A way to model, summarize, and communicate research about people who been observed or researched in some way

Rich descriptions of typical users, not specific people

Represents a significant portion of people in the real world

Characteristics of Persona

- Capture a set of user characteristics (user profile)
- Synthesized from real people based on user research
 - Develop a small set of personas with one primary
 - Bring to life with name, characteristics, goals, and personal background relevant to product under development
- Good persona helps designer with design decisions and reminds team about who will use the product

Example of Persona #1

Family traveler



Organised **Practical** **Expects high standard**

Goals

- To book comprehensive travel quickly
- To find a trip that meets the needs of the whole family
- To feel supported and guided from the beginning of the booking experience right to the end.

Frustrations

- Wasting time filling in forms
- Too much irrelevant information
- Existing systems tend to be too diverse and complicated

Bio

Will loves to take his family on adventure holidays to explore new challenges. His children, Sky (8) and Eamonn (15) are old enough to take part in several sporting activities and he wants to make the most of this before they no longer want to go on trips with him and his wife, Claire. He likes the fact that choosing travel options is so much easier than it used to be, but is frustrated by the many different sources and disjointed options that this can result in. He wants a travel organiser that can provide clear support for family holidays while offering as wide a choice as possible.

Motivation

Price	
Comfort	
Choice	

Favourite destinations



Age: 35
Work: Plumber
Family: Married, two children

Personality

Introvert		Extrovert
Thinking		Feeling
Sensing		Intuition

"I want a travel organiser that will offer me a range of potential vacations that suit our needs"

Example of Persona #2



Where does The Concept of Personas Come from

- Informally developed by Alan Cooper in the early '80s
 - a way to empathize with and internalize the mindset of people who would eventually use the software he was designing
- He interviewed several people among the intended audience of the project and got to know them so well that he pretended to be them as a way of brainstorming and evaluating ideas from their perspective
- This method allows Cooper to put users front and center in the design process as he creates software

How Are Personas Created?

Designers are recommended to follow this general formula:

1. Interview and/or observe an adequate number of people.
2. Find patterns in the interviewees' responses.
3. Create archetypical models.
4. Drawing from that understanding of users.
5. Share with others team members.

What are Personas used for?

1

Build Empathy

Crafting the lens through which they will see the world

2

Develop Focus

Help to define who the product is being created for and who not to focus on

3

Communicate and Form Consensus

Help to communicate research findings; Establishing a medium for shared knowledge brings all members of a team on the same page

Scenarios

- User scenarios are detailed descriptions of a user – typically a persona – that describe realistic situations relevant to the design of a solution.
- By painting a “rich picture” of a set of events, teams can appreciate user interactions in context, helping them to understand the practical needs and behaviors of users.

Scenarios Form

May be textual descriptions, animations, audio or video

Example animation scenarios



Source: Keirnan et al. (2015), Figure 1. Reproduced with permission of [ACM Publications](#).

Scenario for Group Travel Organizer

"The Thomson family enjoy outdoor activities and want to try their hand at sailing this year.

There are four family members: Sky (8 years old), Eamonn (12 years old), Claire (32), and Will (35).

One evening after dinner they decide to start exploring the possibilities.

They want to discuss the options together but Claire has to visit her elderly mother so will be joining the conversation from her mother's house down the road.

As a starting point, Will enters an idea they had been discussing over dinner – a sailing trip for four novices in the Mediterranean.

The system supports users to log on from different locations and use different devices so that all members of the family can interact easily and comfortably with it wherever they are.

The system's initial suggestion is a flotilla, where several crews (with various levels of experience) sail together on separate boats.

Sky and Eamonn aren't very happy at the idea of going on vacation with a group of other people, even though the Thomson's would have their own boat.

The travel organizer shows them descriptions of flotillas from other children their ages and they are all very positive, so eventually, everyone agrees to explore flotilla opportunities.

Will confirms this recommendation and asks for detailed options.

As it's getting late, he asks for the details to be saved so everyone can consider them tomorrow.

The travel organizer emails them a summary of the different options available."

Scenarios and Personas

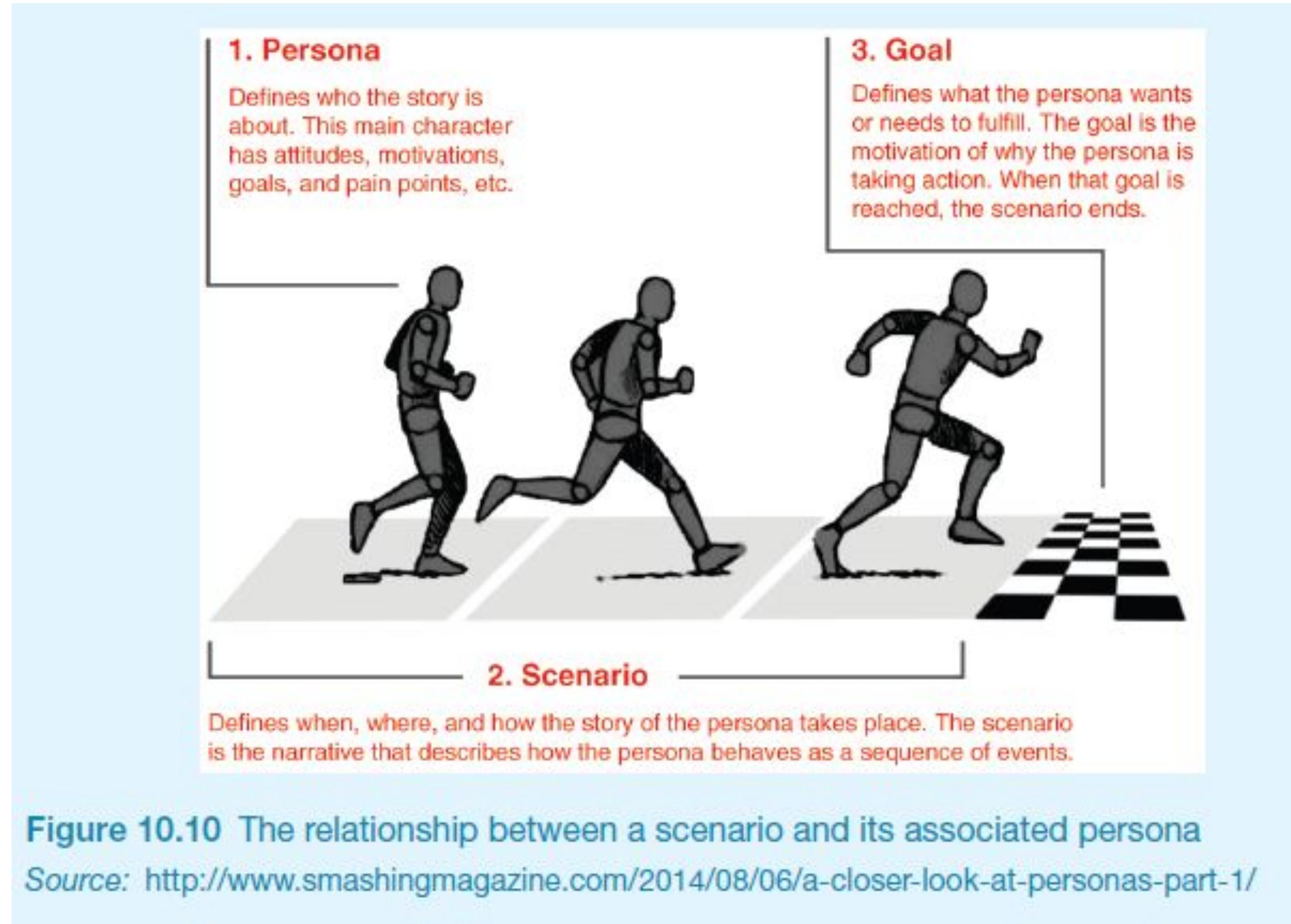


Figure 10.10 The relationship between a scenario and its associated persona

Source: <http://www.smashingmagazine.com/2014/08/06/a-closer-look-at-personas-part-1/>

- These three parts are most effective when used together.
- For instance, in order for a sprinter to reach their potential, they need a place to run and a finish line to cross.
- Without a scenario or end goal, the sprinter would have nothing to do or strive for.

Use Case

Focus on functional requirements and capture interaction

Can be used in design or to capture requirements

Use cases are step-by-step descriptions of interactions

Two styles:

- Essential use cases: division of tasks, no implementation detail
- Use case with normal and alternative courses: more detail

Essential Use Case for Travel Organizer

RetrieveVisa

USER INTENTION

Find visa requirements

Supply required information

Obtain copy of visa info

Choose suitable format

SYSTEM RESPONSIBILITY

Request destination and nationality

Obtain appropriate visa info

Offer info in different formats

Provide info in chosen format

Use Case for Travel Organizer

1. The product asks for the name of the destination country
2. The user provides the country's name
3. The product checks that the country is valid
4. The product asks the user for their nationality
5. The user provides their nationality
6. The product checks the visa requirements of that country for a passport holder of the user's nationality
7. The product provides the visa requirements
8. The product asks whether the user wants to share the visa requirements on social media
9. The user provides appropriate social media information

Use Case for Travel Organizer

Some alternative courses:

4. If the country name is invalid:

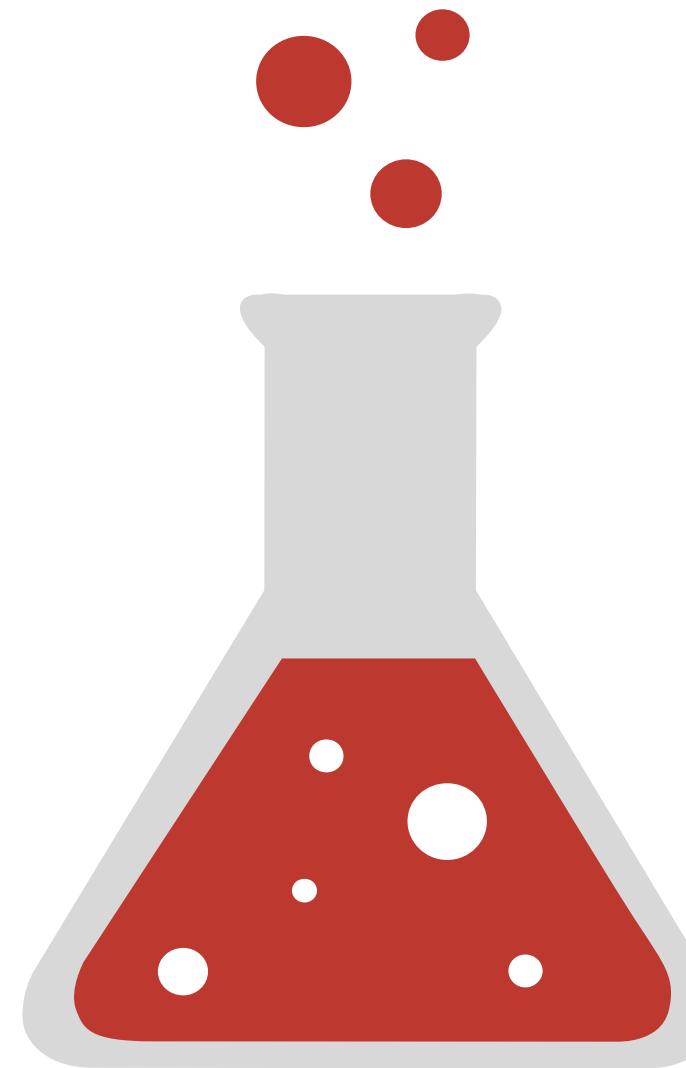
- 4.1: The product provides an error message
- 4.2: The product returns to step 1

6. If the nationality is invalid:

- 6.1: The product provides an error message
- 6.2: The product returns to step 4

7. If no information about visa requirements is found:

- 7.1: The product provides a suitable message
- 7.2: The product returns to step 1



*Creativity is the key to success
in the great education*

Terima Kasih

Emotional Interaction

IF3151 Human Computer Interaction

K1 Dessi Puji Lestari / Lenny Putri Yulianti

K2 Fitra Arifiansyah

K3 Adi Mulyanto / Maya Nabila



Overview

1

Emotions and the user experience

2

Expressive and emotional design

- How the 'appearance' of an interface can affect users

3

Affective computing and emotional AI

4

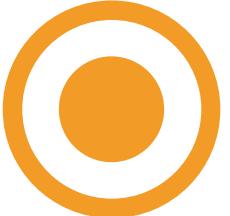
Persuasive technologies and behavioral change

5

Anthropomorphism

- The pros and cons

1. Emotions and the user experience

-  HCI has traditionally been about designing efficient and effective systems
-  Now more about how to design interactive systems that make people respond in certain ways
 - For example, to be happy, to be trusting, to learn, or to be motivated
-  Emotional interaction is concerned with how we feel and react when interacting with technologies
-  Affective computing is improving with better recognition software and machine learning algorithms

Emotional interfaces



What makes us **happy, sad, annoyed, anxious, frustrated, motivated, delirious**, and so on

- Translating this into different aspects of the **user experience**



Why people become **emotionally attached** to certain products (for instance, virtual pets)



Can social robots help reduce **loneliness** and improve **well-being**?



How to **change** human behavior through the use of **emotive feedback**

Activity



Try to remember the emotions you went through when buying a big ticket item online (for example, a refrigerator, a vacation, or a computer)



How many different emotions did you go through?

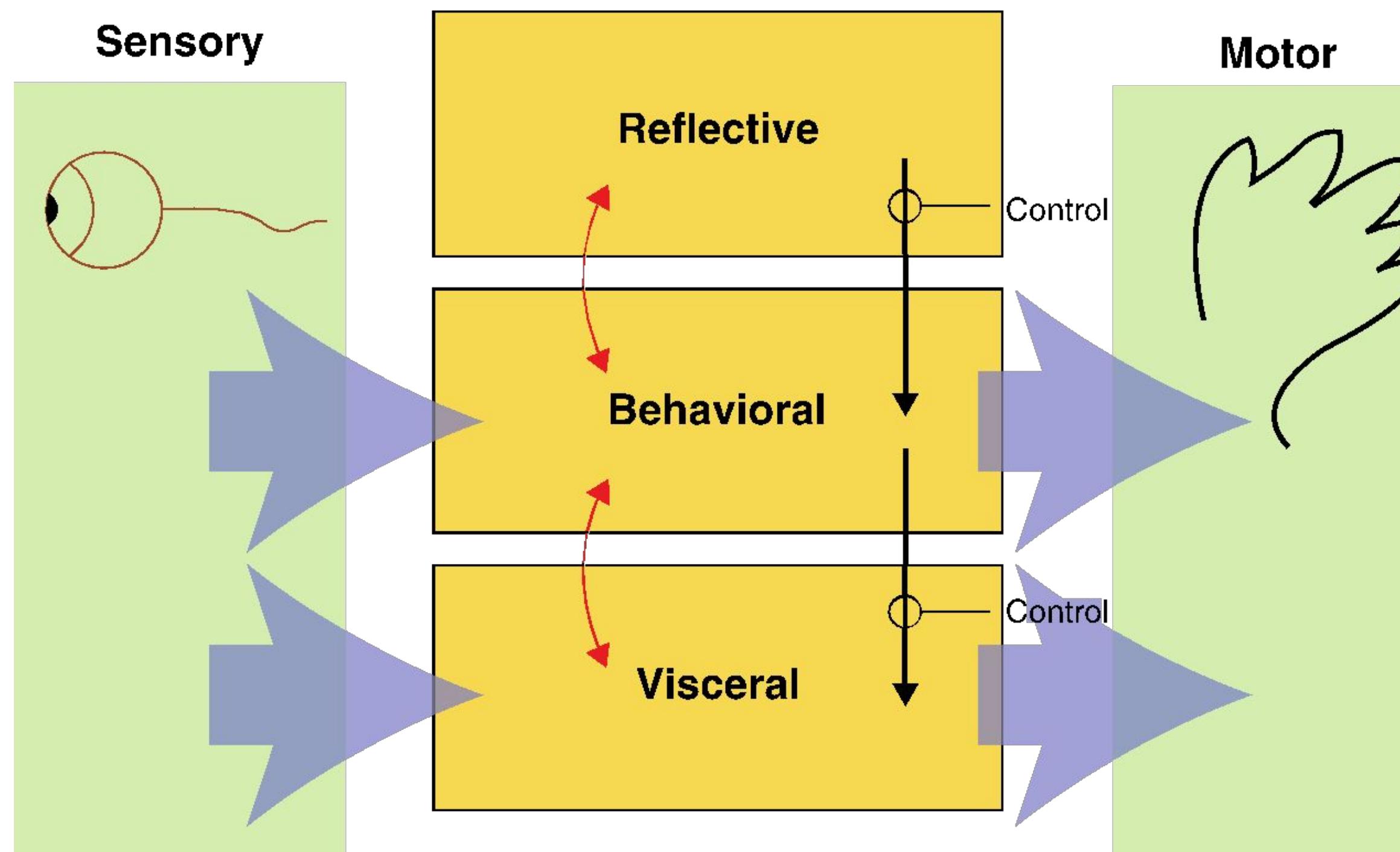
Why has
this simple way
of obtaining
visitor feedback
been so effective?



Pulling at the heart strings with an emotive message



Ortony et al. (2005) model of emotional design



Designing with the three levels in mind

1. **Reflective design** is about considering the meaning and personal value of a product
2. **Behavioral design** is about use, and it equates with traditional values of usability
3. **Visceral design** refers to making products look, feel, and sound good

Claims from model



Our emotional state changes how we think

- When **frightened or angry**, we focus narrowly and our bodies respond by tensing muscles and sweating
 - More likely to be less tolerant
- When **happy**, we are less focused and our bodies relax
 - We are more likely to overlook minor problems and be more creative

Analyzing a swatch watch design using the model



- Cultural images and graphical elements designed at the reflective level
- Affordances of use at the behavioral level
- Brilliant colors and wild design attract user's attention at the visceral level

2. Expressive interfaces

- | Provide **reassuring feedback** that can be both **informative** and **fun**
- | Can also be **intrusive**, however, causing people to become **annoyed** and even **angry**
- | **Color, icons, sounds, graphical elements, and animations** are used to make the 'look and feel' of an **interface appealing**
 - Conveys an emotional state
- | In turn, this can affect the **usability** of an interface
 - People are prepared to put up with certain aspects of an interface (for instance, slow download rate) if the end result is appealing and aesthetic



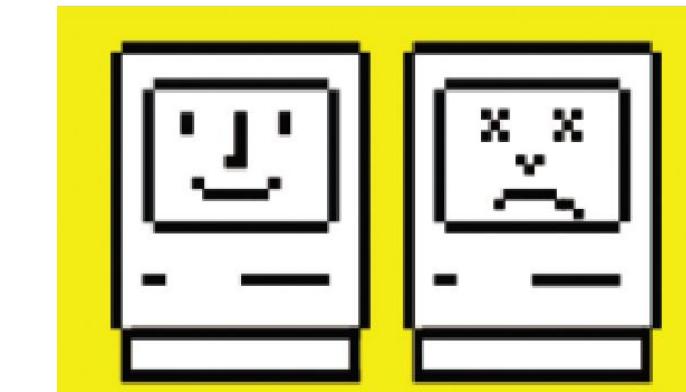
The appearance of an interface

0 Emotional icons were used in the 1980s to indicate rebooting or crashed computer

- Smiling apple face

0 Nowadays, computers use more impersonal but aesthetically-pleasing icons to indicate that the user needs to wait

- Beachball



(a)



(b)

The design of thermostats

0 The Nest thermostat has a minimalist and aesthetically-pleasing design

- Round face and simple dial
- Large font and numbers



(a)

0 It is very different from earlier thermostat designs

- Utilitarian and dull



(b)

Annoying interfaces



Microsoft pioneered friendly interfaces for technophobes

- For example, 'At Home with Bob' software
- 3D metaphors based on familiar places (for instance, living rooms)



Agents in the guise of pets (such as a bunny or dog) were included to talk to the user

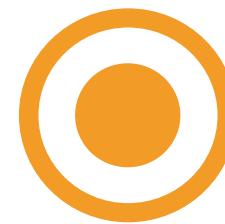
- Made users feel more at ease and comfortable
- But many people did not like the idea of Bob, so it never made it as a product

Microsoft's Clippy and IKEA's Anna



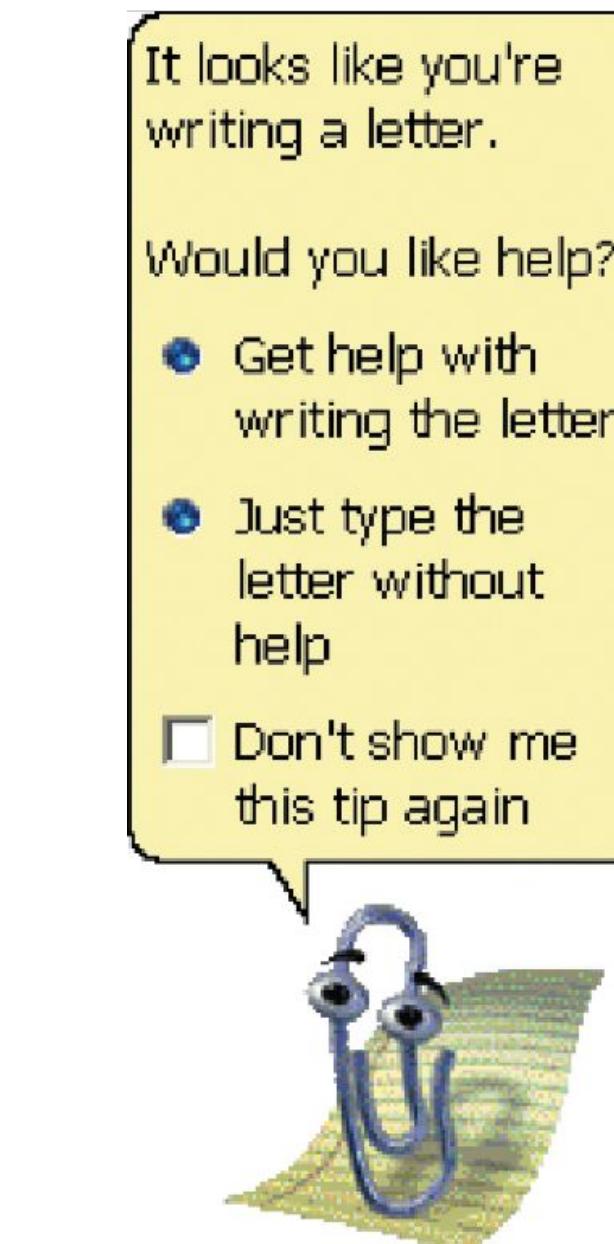
Clippy did... but was disliked by so many?

- Was it annoying, distracting, patronizing, or other?

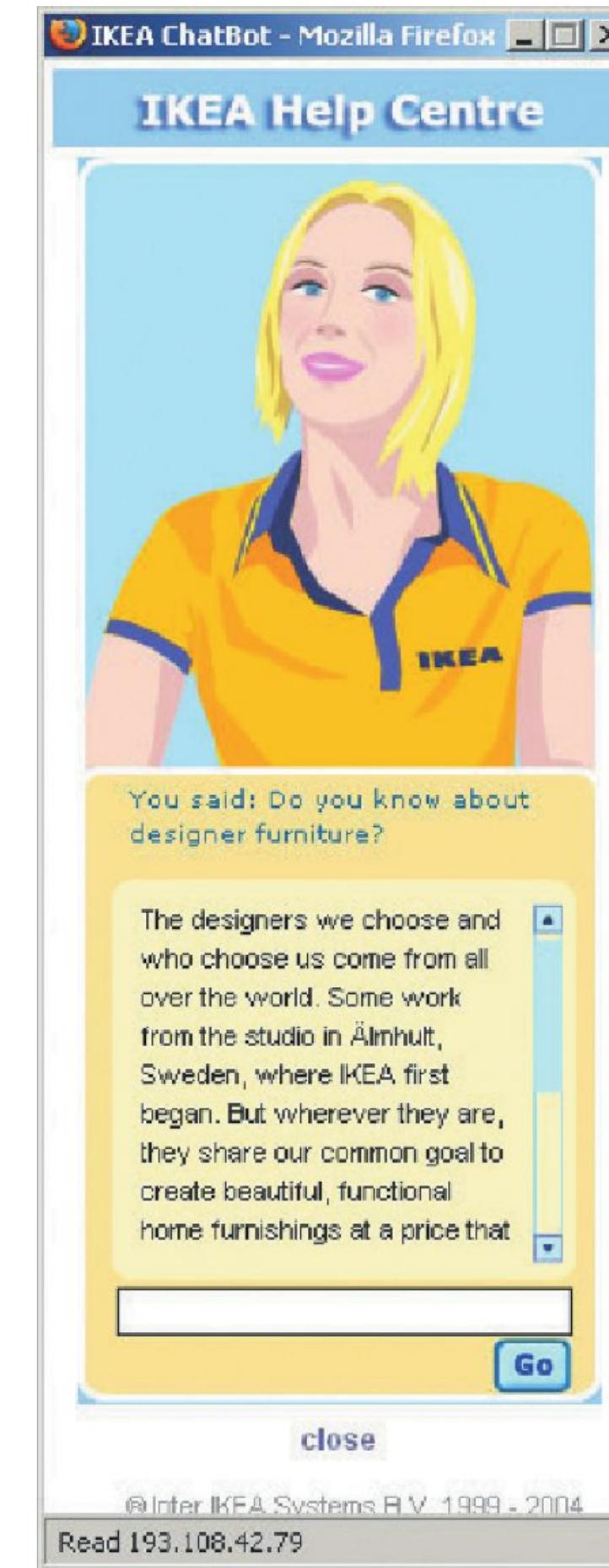


Anna appeared as a virtual agent

- Blinked, moved her lips and head to suggest facial expressions



(a)



(b)

3. Frustrating interfaces

Many causes:

- ▶ When an application **doesn't work** properly or **crashes**
- ▶ When a system doesn't do what the **user wants** it to do
- ▶ When a **user's expectations** are not met
- ▶ When a system does not provide **sufficient information** to enable the user to know what to do
- ▶ When **error messages** pop up that are **vague, obtuse, or condemning**
- ▶ When the appearance of an interface is **garish, noisy, gimmicky, or patronizing**
- ▶ When a system requires users to carry out **too many steps** to perform a task, only to discover that a **mistake** was made earlier and that they need to start all over again

Error messages

“The application Word Wonder has unexpectedly quit due to a type 2 error.”

Why not instead?

“The application has unexpectedly quit due to poor coding in the operating system”

Shneiderman's classic guidelines for error messages include:

- Avoid using terms like FATAL, INVALID, or BAD
- Audio warnings
- Avoid UPPERCASE and long code numbers
- Messages should be precise rather than vague
- Provide context-sensitive help

A friendly cute
image instead of
the impersonal
404 error message



Dilemma: Should computers say they're sorry?

- Reeves and Naas (1996) argue that computers should be made to apologize
- Should emulate human etiquette
- Would users be as forgiving of computers saying they're sorry as people are of each other when saying they're sorry?
- How sincere would they think the computer was being? For example, after a system crash:
 - “I’m really sorry I crashed. I’ll try not to do it again”
- How else should computers communicate with users?

Dilemma: Should voice assistants teach kids good manners?

- Many children talk to Alexa as if she was their friend
- They also learn that it is not necessary to say please and thank you to her when asking questions
- Is this lack of using etiquette a problem?
- Would it transfer over to real life situations?
 - For example, demanding “Auntie, get me my drink.”
- Parents should still teach their kids good manners
- Alexa can be configured to be polite as well
- How much parental control should voice assistants be given?
- Would children find it weird or creepy that their Alexa (who is their friend) nags them to clean their teeth?

Affective Computing and Emotional AI

- *Affective computing* is concerned with how to use computers to recognize and express emotions as humans do (Picard, 1998)
- It involves designing ways for people to communicate their emotional state
- It uses sensing technologies to measure GSR, facial expressions, gestures, and body movement
- Explores how affect influences personal health

Affective Computing and Emotional AI (2)

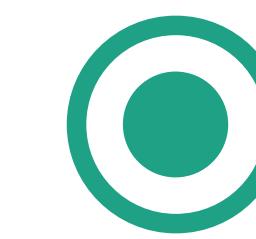
- *Emotional AI* aims to automate the measurement of feelings and behavior using AI to infer them from facial expressions and voice
- The goal is to predict user's emotions and aspects of their behavior
 - For example, what is someone most likely to buy online when feeling sad, bored, or happy

Techniques used



- Cameras for measuring facial expressions
- Biosensors placed on fingers or palms to measure GSR
- Affective expression in speech (for example, intonation, pitch, and loudness)
- Body movement and gestures using accelerometers and motion capture systems

Classification of emotions



Six core expressions typically measured:

- Sadness, disgust, fear, anger, contempt, and joy



Type of facial expression chosen by AI through detecting presence of absence of:

- Smiling, eye widening, brow raising, brow furrowing, raising a cheek, mouth opening, upper-lip raising, and wrinkling of the nose

How is this emotional data used?

- If user screws up their face when an ad pops up
 - Feel disgust
- If user starts smiling
 - They are feeling happy
- Website can adapt its ad, movie storyline, or content to match user's emotional state
- If system used in a car, it might detect an angry driver and suggest they take a deep breath
- Eye-tracking, finger pulse, speech, and words/phrases also analyzed when tweeting or posting to Facebook

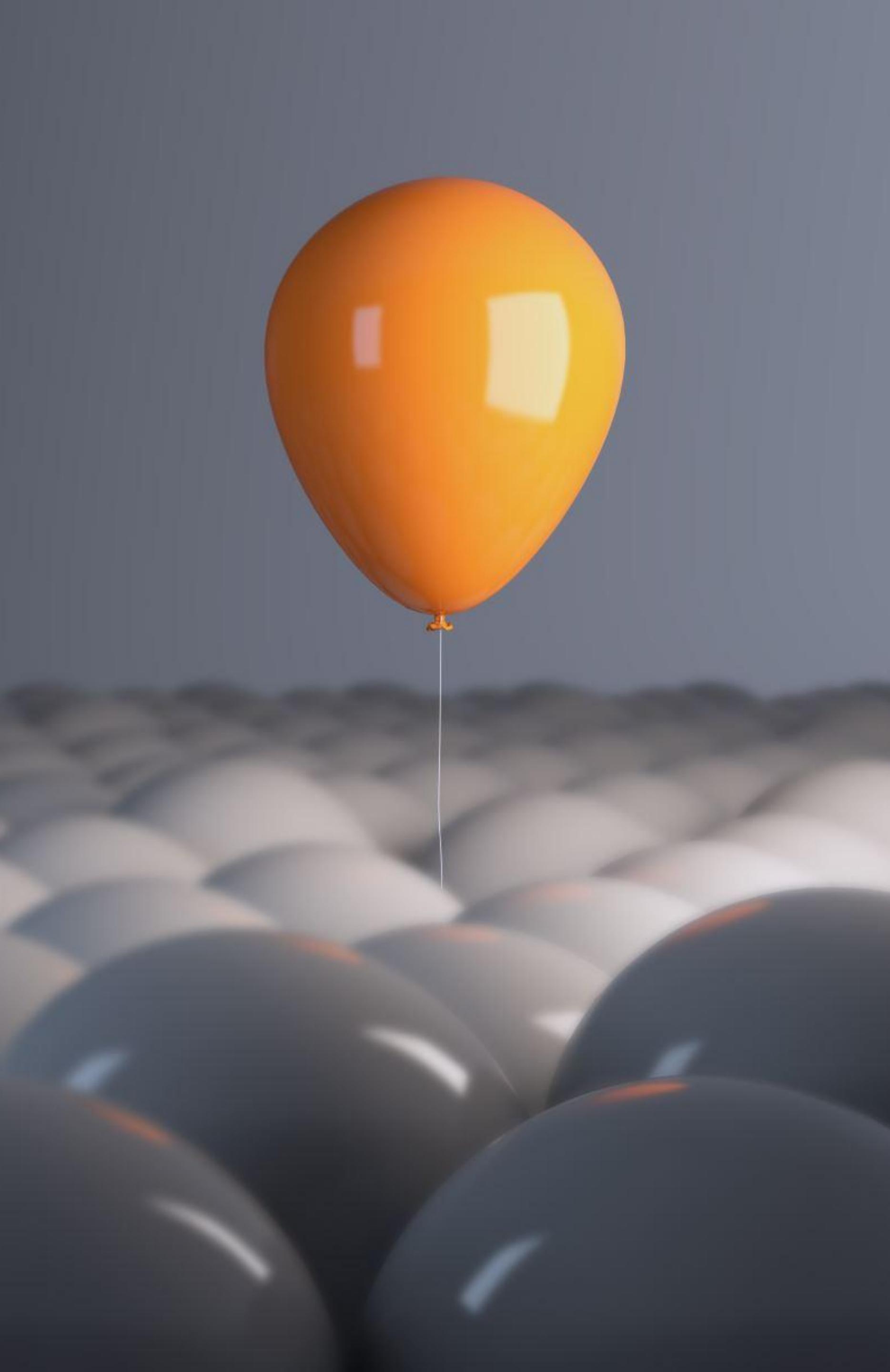
Indirect emotion detection



Also used more to infer or predict someone's behavior

- For instance, determining a person's suitability for a job or how they will vote in an election

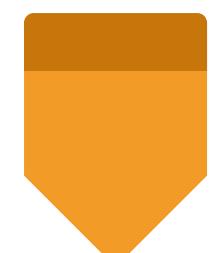
Do you think it is ethical that technology can read your emotions from your facial expressions or from your tweets?



4. Persuasive technologies and behavioral change



Interactive computing systems designed to change people's **attitudes** and **behaviors** (Fogg, 2003)



A diversity of techniques now used to change what they **do** or **think**

- Pop-up ads, warning messages, reminders, prompts, personalized messages, recommendations, or Amazon 1-click
- Commonly referred to as *nudging*

How effective?



Can interactive technologies that monitor, nag, or behave like a human keep them interested in looking after it and in doing so make themselves more fit?



How does looking after a virtual pet change a child's behavior?

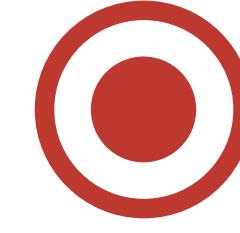
- Emotional attachment
- Happy Pokemon makes them feel good
- Sulking Pokemon makes them feel bad



Tracking devices

- | Mobile apps designed to help people monitor and change their behavior (for instance, fitness, sleeping, or weight)
- | Can compare with online an leaderboard and charts to show how they have done in relation to their peers and friends
- | Also apps that encourage reflection, which in turn increase well-being and happiness

Sustainable HCI

-  Focus on designing tech interventions to help people reduce their energy consumption
-  An effective technique is to provide homeowners with feedback on their consumption
-  Simple infographics and emoticons are often most powerful:
 - Encourage people to reflect and see what they can change to reduce their energy consumption
-  Peer pressure and social norms are also powerful methods

The Tidy Street project

Large-scale visualization of the street's electricity usage

- Stenciled display on the road surface using chalk
- Provided real-time feedback that all could see change each day
- Reduced electricity consumption by 15 percent
 - (Bird and Rogers, 2010)



Phishing scams



Web used to deceive people into parting with personal details

- For example, PayPal, eBay, and “you won the lottery” emails



Allows Internet fraudsters to access their bank accounts and draw money from them



Many vulnerable people fall for it



The art of deception is centuries old but internet allows ever more ingenious ways to trick people

Anthropomorphism

- Attributing **human-like qualities** to **inanimate objects** (for instance cars or computers)
- Well known phenomenon in advertising
 - Dancing butter, drinks, and breakfast cereals
- Much exploited in human-computer interaction
 - Make user experience **enjoyable** and **motivating**
 - Make people **feel at ease** by reducing anxiety
- Furnishing technologies with **personalities** can make them **enjoyable** to interact with

Which message you prefer?

As a welcome message:

- “*Hello Chris! Nice to see you again. Welcome back. Now what were we doing last time? Oh yes, Exercise 5. Let's start again.*”
- “*User 24, commence Exercise 5.*”

Which do you prefer?

Feedback when user gets something wrong:

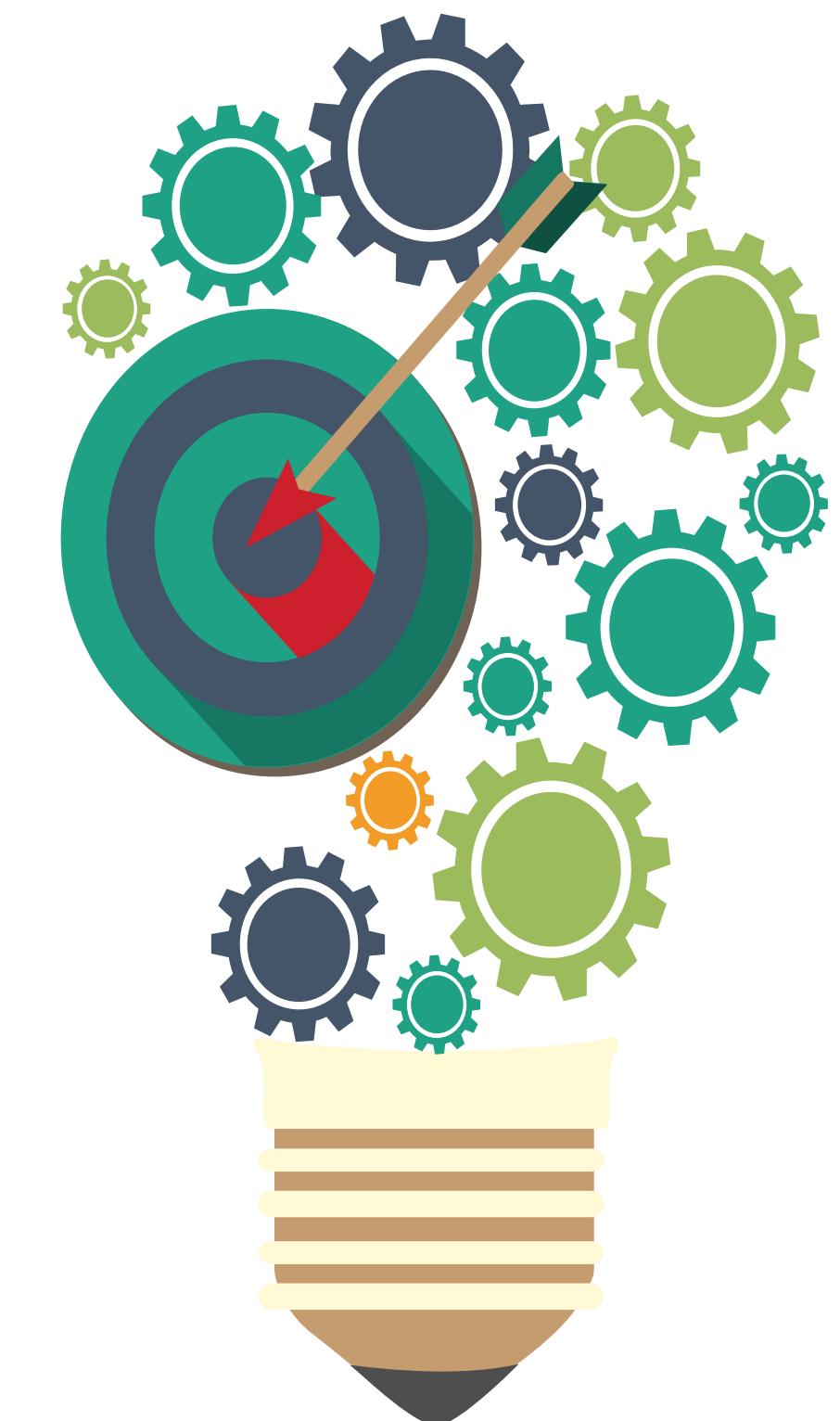
1. “Now Chris, that’s not right. You can do better than that. Try again.”
2. “Incorrect. Try again.”

Is there a difference as to what you prefer depending on type of message? Why?

Evidence to support anthropomorphism

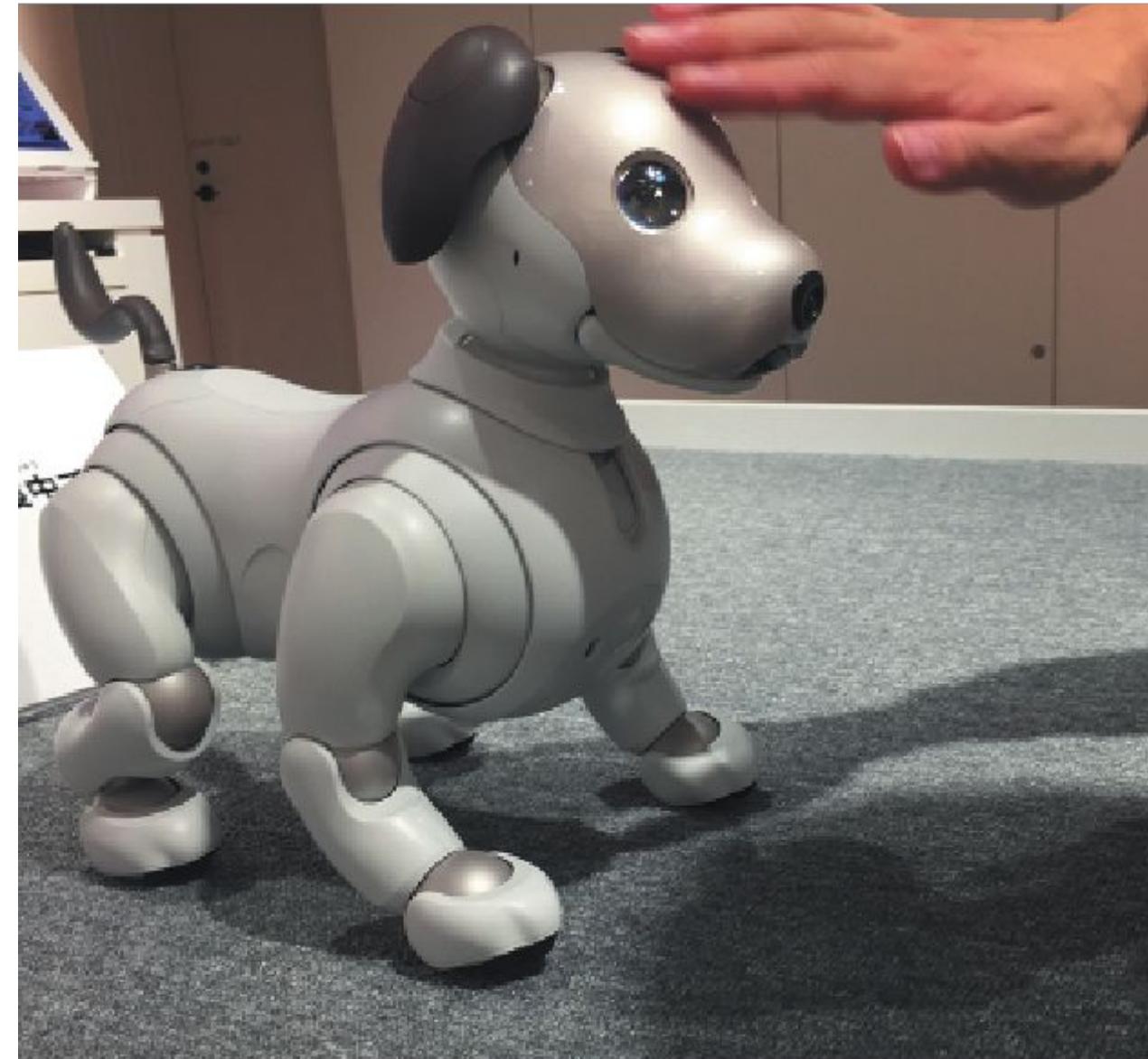
- Reeves and Naas (1996) found that computers that flatter and praise users in educational software programs result in:
 - Positive impact on users

“Your question makes an important and useful distinction. Great job!”
- Students were more willing to continue with exercises with this kind of feedback



Robot-like or cuddly?

Which do you prefer and why?



(a)

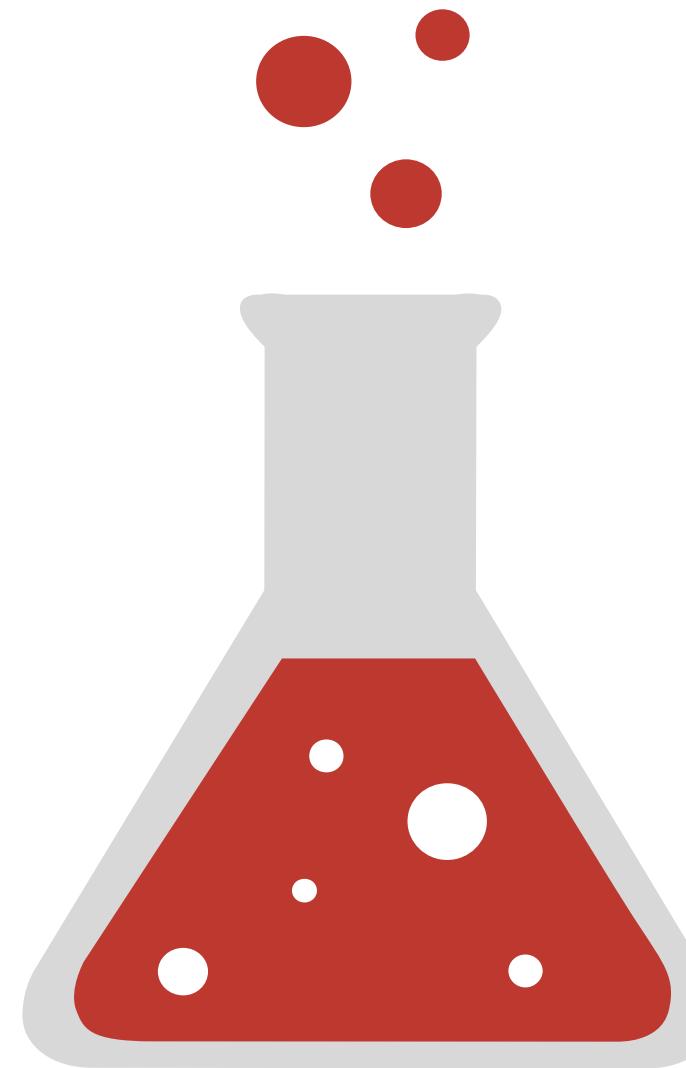
Aibo

(b)

The Haptic Creature

Is it OK
for seniors to develop
an emotional
attachment
with the robot Zora?





*Creativity is the key to success
in the great education*

Terima Kasih

Social Interaction

IF3151 Human Computer Interaction

K1 Densi Puji Lestari / Lenny Putri Yulianti

K2 Fitra Arifiansyah

K3 Adi Mulyanto / Maya Nabila



Overview

1

What is social interaction?

2

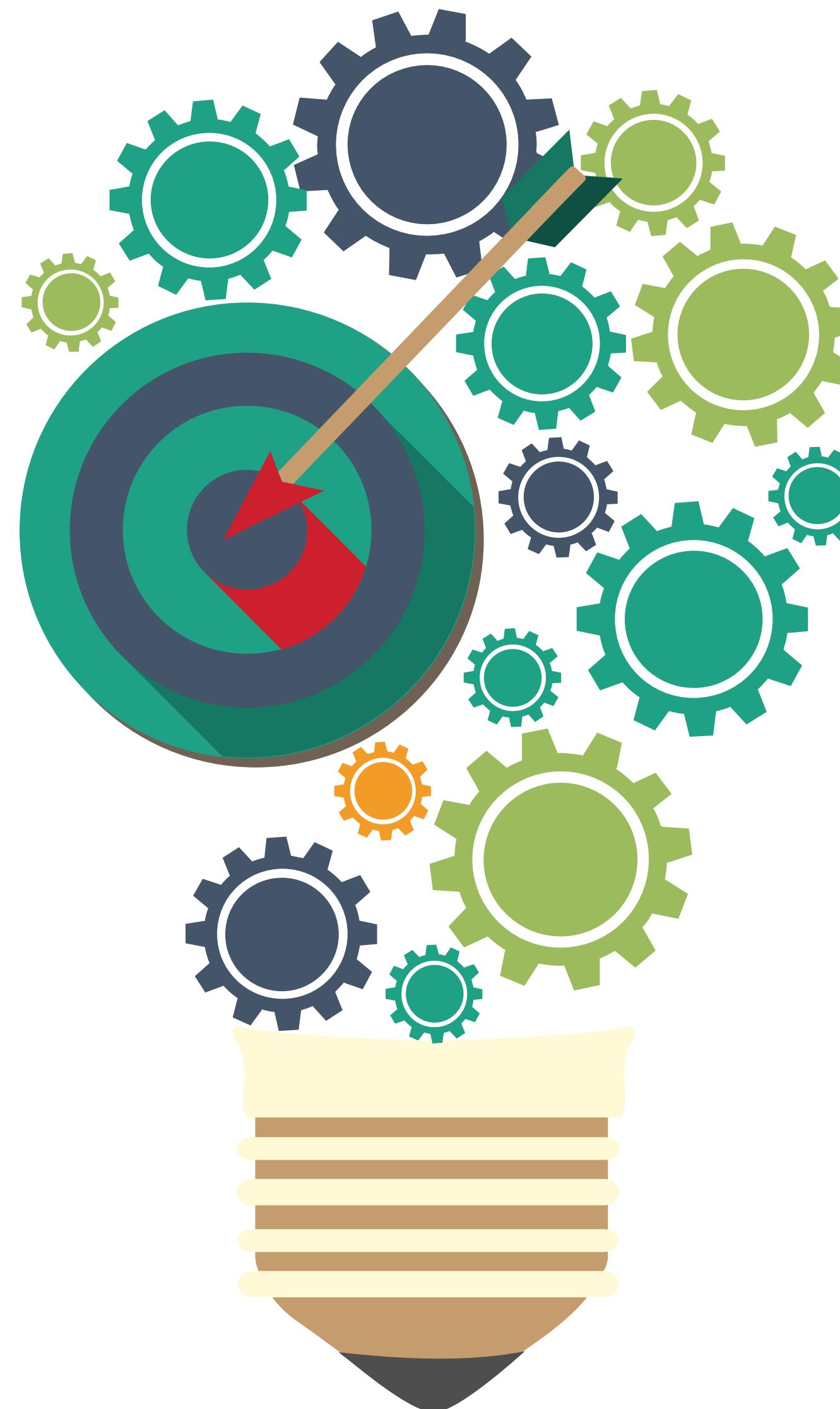
What is social presence?

3

Overview of technologies

4

Social engagement



Social Interaction



We live together, work together, play together, talk to each other, and socialize



Social technologies developed to enable us to persist in being social when apart

- They differ in how they support us
- Some encourage social interactions (for example, family games with Alexa)
- Others have a negative impact on everyday conversations (Turkle, 2015)

Are we spending too much time in our own digital bubbles?



Conversational mechanisms

| Various mechanisms and ‘rules’ are followed when holding a conversation face to face, such as mutual greetings

- A: Hi there
- B: Hi!
- C: Hi
- A: All right?
- C: Good, how’s it going?
- A: Fine, how are you?
- C: OK
- B: So-so. How’s life treating you?

Conversational rules

Sacks et al. (1978) conversation analysis of conversations propose three basic rules



Rule 1: The current speaker chooses the next speaker by asking opinion, question, or request



Rule 2: Another person decides to start speaking



Rule 3: The current speaker continues talking

More conversational rules

| Turn-taking used to coordinate conversation

A: Shall we meet at 8:00?

B: Um, can we meet a bit later?

A: Shall we meet at 8:00?

B: Wow, look at him?

A: Yes, what a funny hairdo!

B: Um, can we meet a bit later?

| Back channeling to signal to continue and following

- Uh-uh, umm, ahh

Further conversational rules

Farewell rituals

- Bye then, see you, yeah bye, see you later....

Implicit and explicit cues

- For instance, looking at watch or fidgeting with coat and bags
- Explicitly saying, “Oh dear, look at the time, I must go, I’m running late...”

What happens in online conversations?



Do the same conversational rules apply?



Are there different kinds of breakdowns?



How do people repair them for:

- Email?
- Chat?
- Texting?
- Video conferencing software?

Telepresence and Social Presence



Telepresence refers to one party being present with another party, who is present in a physical space, such as a meeting room



Social presence refers to the feeling of being there with a real person when in virtual reality

Telepresence robots



Susan Lechelt at ACM CHI



Enable people to attend events who could not do so, such as by controlling their robot remotely

- In places such as schools, conferences, and museums
- Early example: Beam+
- Often dressed up to appear like the person to others at the event
- Positive experience of being there

Social presences



Facebook's vision of socializing in a 3D world using VR

Two avatars talking at a virtual table

Users experience each other through
donning VR headsets

Coordination mechanisms



When a group of people act or interact together, they need to coordinate themselves

- For example, when playing football or navigating a ship



To do so, they use:

- Verbal and non-verbal communication
- Schedules, rules, and conventions
- Shared external representations

Coordination mechanisms (face to face)



Talk is central



Non-verbal also used to emphasize and as a substitute

- For instance, nods, shakes, winks, glances, gestures, and hand-raising



Formal meetings

- Explicit structures such as agendas, memos, and minutes are employed to coordinate the activity

Shareable Interfaces



Designed to capitalize on existing forms of coordination and awareness mechanisms



Several studies investigating whether they help people to work together better, have found:

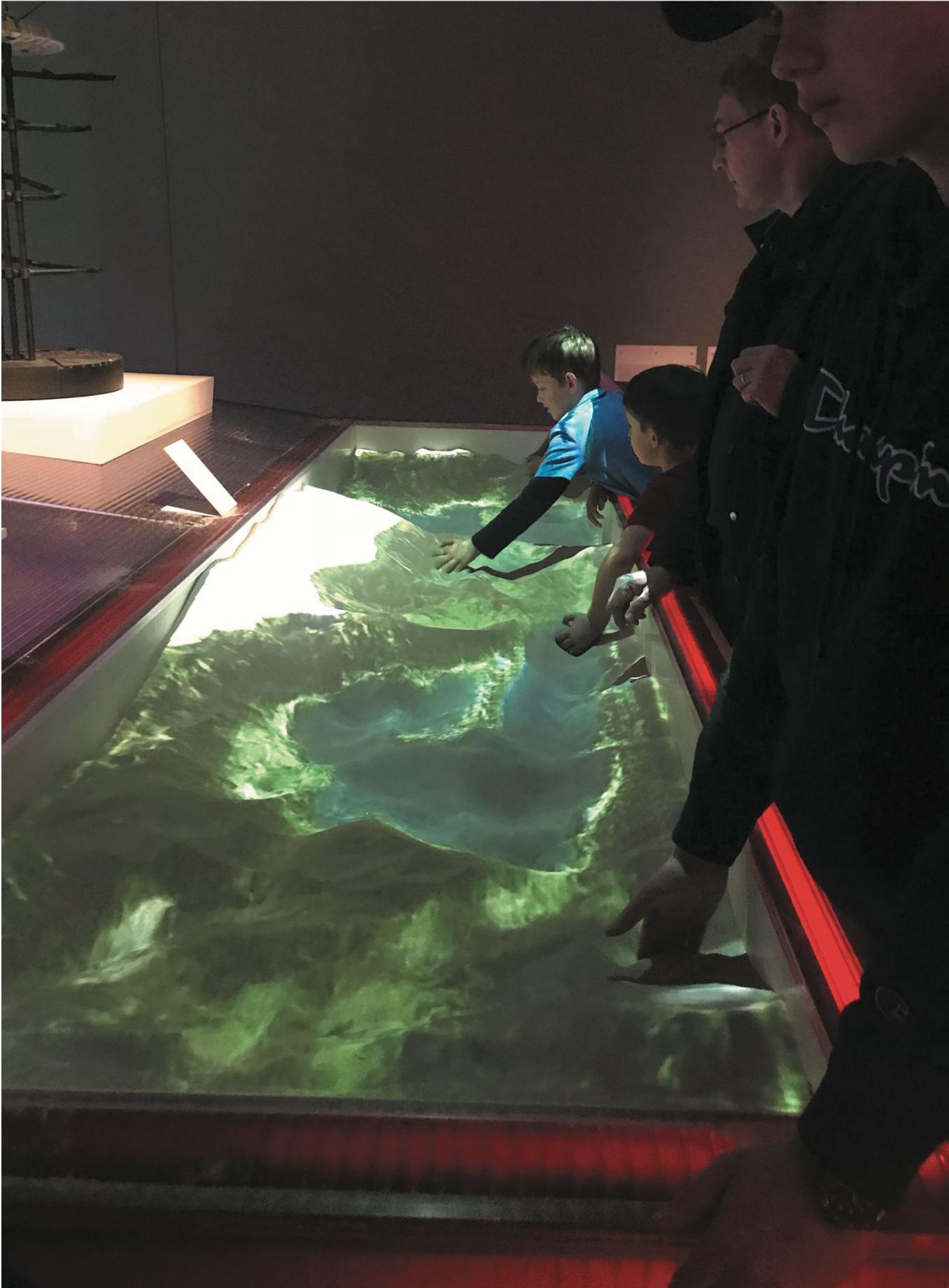
- More equitable participation
- More natural to work around
- More comfortable sitting around a table than standing in front of a display

Some examples



Sococo floor plan of a virtual office: who is where and who meeting with whom

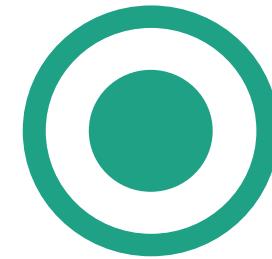
Some examples



Playing together in same space using AR

- Visitors using an AR sandbox at the V and A
- Visitors sculpt landscapes out of sand
- System reacts with changing superimposed digital colored landscape
- Enables creative forms of collaboration

Social Engagement



- Refers to participation in activities of a social group
- Social exchange where people give or receive something from others



- Voluntary, unpaid and often altruistic (in the sense of sharing and doing good for others)



- Websites often used as hub to connect people
- Retweeting is a powerful way of connecting millions of people

Retweeting goes viral

- The epic Twitter battle between Ellen DeGeneres and Carter Wilkerson
- Millions retweeted in the space of hours
- Connected millions of people for a fun cause
- Many people found it amusing to join in and watch the numbers grow



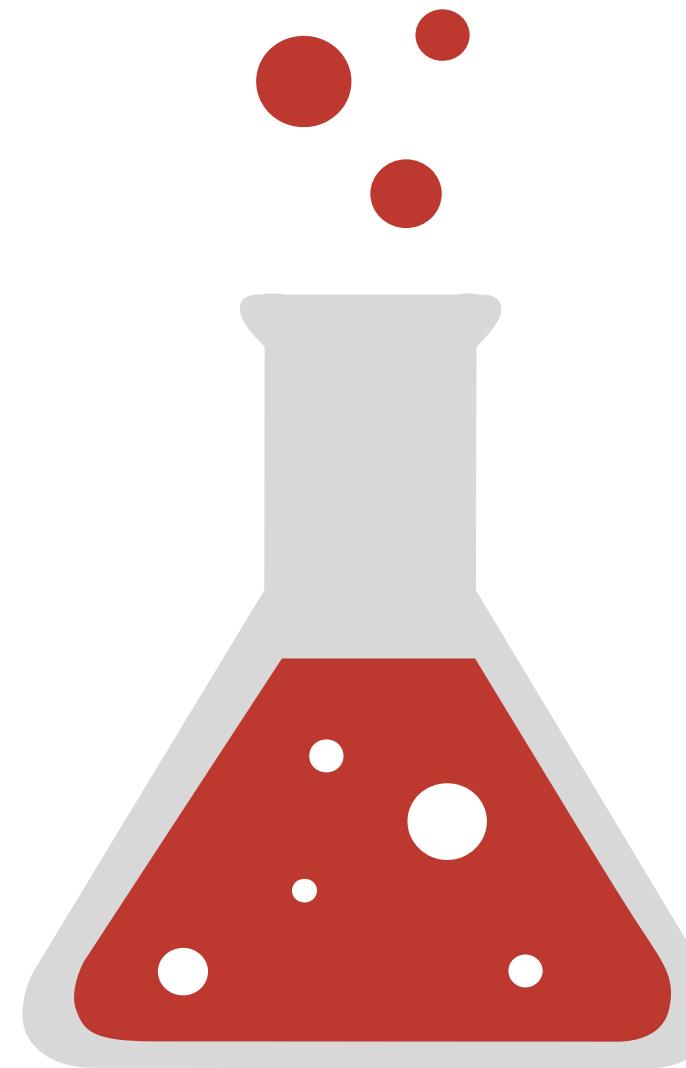
Carter Wilkerson @carterjwm



HELP ME PLEASE. A MAN NEEDS HIS NUGGS

02:38 - 6 Apr 2017

994K 3.61M people are talking about this



*Creativity is the key to success
in the great education*

Terima Kasih
