The Human Factor
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Bringing the Human Factors Together

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What we've touched on so far:

- Importance of considering a variety of human factors in technology design and evaluation:
  - *Anthropometric factors: physical, anatomical and physiological aspects*
  - *Behavioural factors: what can users see, perceive and act on?*
  - *Cognitive factors: what cognitive processes are involved when someone uses a system?*
  - *Social factors: what is the social context in which a system is used?*

- Say, do and make methods for evaluating technology

Today…

- Importance of considering a variety of human factors in technology design and evaluation:
  - *Anthropometric factors: physical, anatomical and physiological aspects*
  - *Behavioural factors: what can users see, perceive and act on?*
  - *Cognitive factors: what cognitive processes are involved when someone uses a system?*
  - ***Cultural factors: how do beliefs, values, traditions, norms shape perceptions and use of a system?***
  - *Social factors: what is the social context in which a system is used?*

- Say, do and make methods for evaluating technology
  - **Reflecting on evaluation in relation to goals and human factors**
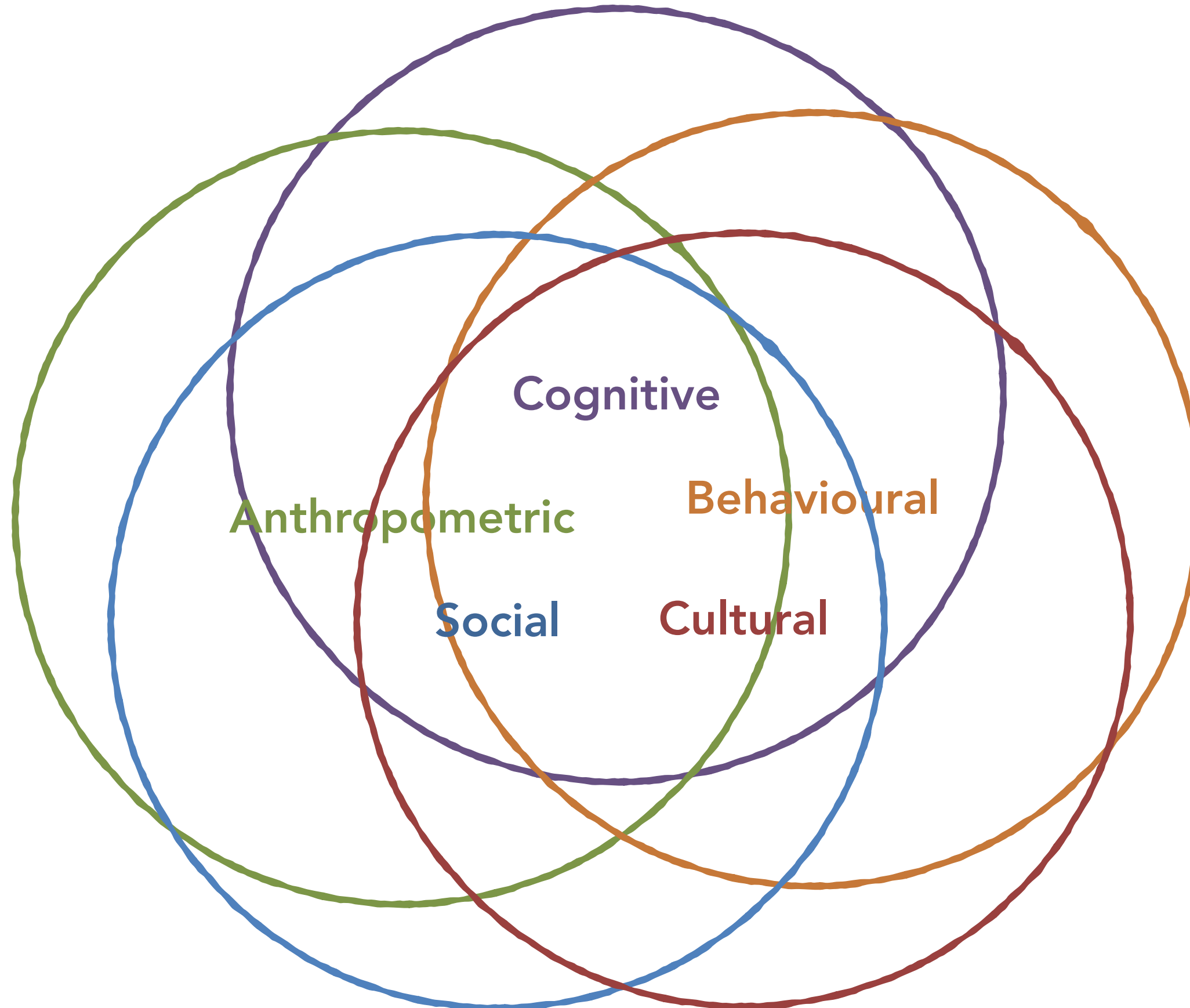
What is culture?

What is culture?

Linked to beliefs, values, traditions and norms

Goes beyond just national cultural to cultures of groups and communities more broadly

e.g., ethnic groups, specific communities (in person or online), subcultures, countercultures, etc.

ABCCS

A bit on culture

*Technology can **shape** culture*

- *How we communicate*
- *Development of new cultures, e.g., over distance*
- *Our social norms and traditions*

A bit on culture

*Technology is designed **with** cultural norms*

A bit on culture

*Technology is designed **with** cultural norms*

-What is aesthetically appealing
-What is acceptable/unacceptable
-What is valued (e.g., privacy, individualism, autonomy?)
-What metaphors resonate (e.g., folders)
-How people communicate and act

Cultural mismatches

These days often technology is internationalised rather than localised - this can often lead to cultural mismatches and failure of products in particular contexts.
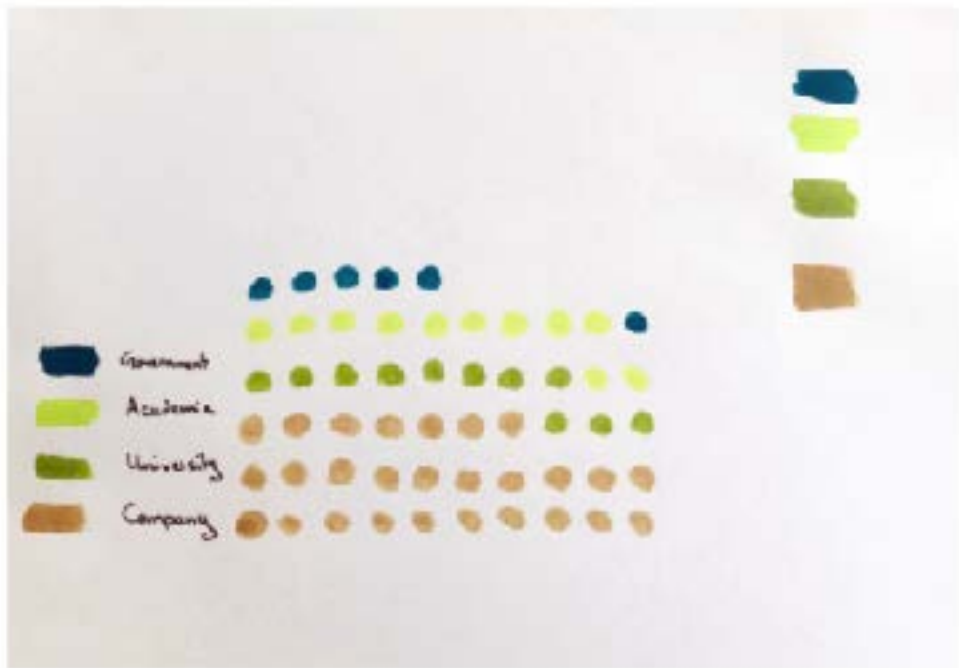
Peter Kariuki - ACM CHI Keynote 2023 - https://www.youtube.com/watch?v=vRYlokbxzmM (24'-30')

Technology and identity

Facebook's initial attempt to allow users to create additional genders, circa 2014. Image courtesy of Slate, reproduced from *Data Feminism*

Technology and identity

Response Time		Argument		Outcome		Feelings	
Promptly (< 24h)	16	None	16	No change	26	Exhaustion	19
Delayed (>24h)	12	Deference to unknown future	12	Systemic change	9	Frustration	10
None	9	External constraints	7	Individual solution	5	Gratitude	7
Misgendering	8	Need for discussion/documentation	6	Incomplete change	5	Anger	5
Phone	5	Apology	3	Silent change	2	Defeat	5
		Ignored	2	Voucher	1	Anxiety	4
		Nice thought, thanks	2			Excitement	2
						Confusion	2

"This is getting draining beyond compare and I thought at the start that I [was feisty enough] to challenge this on the level I am, but oh [expletive] this is super hard." - Dr. Katta Spiel

Key Reference
Spiel, K. (2021). " Why are they all obsessed with Gender?"—(Non) binary Navigations through Technological Infrastructures. ACM DIS.

Questions that arise

*Need to be aware of our **own** ways of seeing when designing and evaluating…*

Who is the technology for?

Who is involved in the process?

What are our assumptions/values as designers/developers and do they match those of the intedned users?

What do we consider to be 'good' and do those who we intend to use the technology agree?

What might we be missing and how do we account for that?

What do we mean by 'evaluating' a technology?

What do we mean by 'evaluating' a technology?

- The idea of 'evaluation' is often be oversimplified!
- Not always just how few errors people, in general, make when using technology
- Can also be about how technology makes people feel, how it achieves a particular desired effect (e.g., collaboration), whether it aligns with their values and life, how it fits into life in practice
- Need to consider how a particular methodological design is related to: **participation, context, human factors, focus, and data gathering/analysis**

What do we mean by 'evaluating' a technology?

Lens of participation:

- Who is involved?

- How are they involved?
  - E.g., Are they contributing to the design? Do they have a say in shaping the technology? Or are they just providing feedback?

- Conversely, who is not involved? Is this an issue?
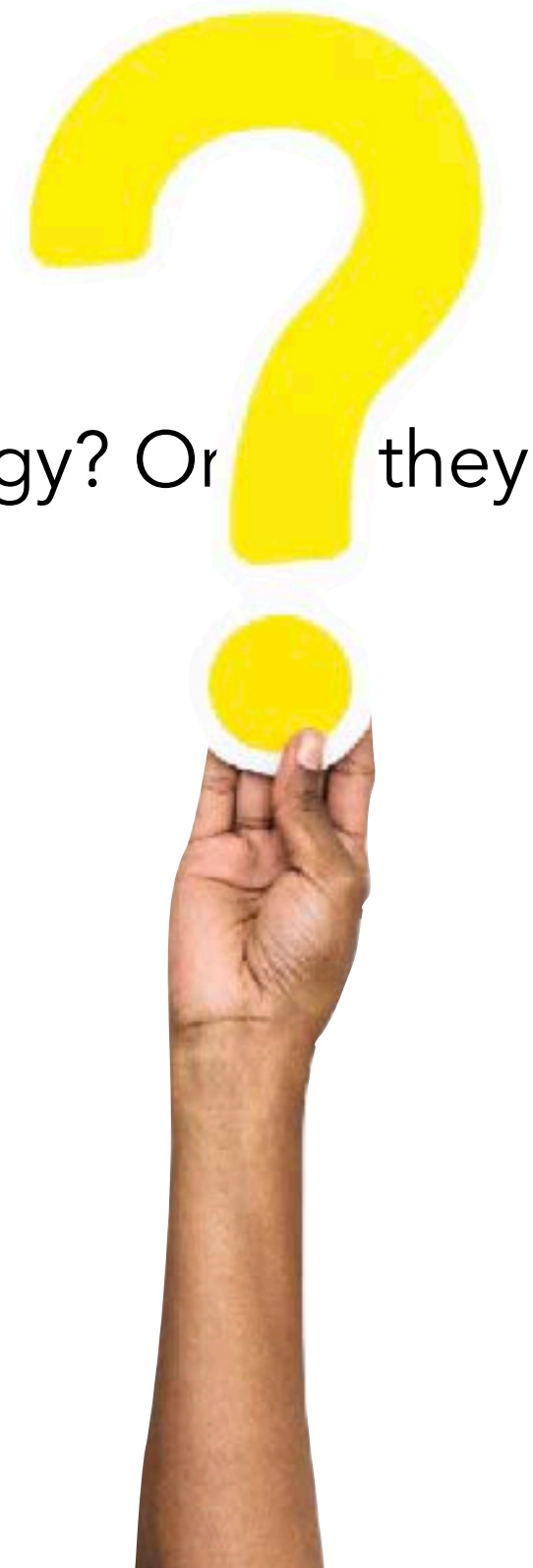
What do we mean by 'evaluating' a technology?

Lens of context:

- 'Controlled' studies - researcher present in a predetermined setting, able to control many 'confounding' factors
  - e.g., lab usability testing, interviews in a researcher-booked room
- 'In situ'/'in the wild studies' - in the intended context
  - e.g., ethnographic work, observation, contextual inquiry, etc.

Key Reference
Yvonne Rogers. 2011.
Interaction design gone wild:
striving for wild theory.
interactions 18, 4

What do we mean by 'evaluating' a technology?

Lens of human factors:

- *A*nthropometric factors: physical, anatomical and physiological aspects
- *B*ehavioural factors: what can users see, perceive and act on?
- *C*ognitive factors: what cognitive processes are involved when someone uses a system?
- *C*ultural factors: how do beliefs, values, traditions, norms shape perceptions and use of a system?
- *S*ocial factors: what is the social context in which a system is used?

What do we mean by 'evaluating' a technology?

Lens of focus:

E.g.,
- How easy/intuitive a technology is to use
- How it makes people feel
- Whether it achieves a particular desired effect (e.g., collaboration, supporting focus, supporting behaviour change, etc.)
- How it aligns with their values and life
- How it fits into life in practice
- Does it change how things are normally done?

What do we mean by 'evaluating' a technology?

Lens of data gathering and analysis:

- Quantitative
  - Reporting patterns and trends, generalising to a larger population
- Qualitative
  - Exploratory research, e.g., familiarising with a topic, defining problems, exploring potential design solutions
  - Rich qualitative understandings of phenomena/experiences

Reflecting on your methods in context of human factors

In your groups, focus on *one* of the methods you've each decided to use for CW1 and have each group member spend *5 minutes* summarising the method in terms of:

- **participation** - who are the participants? How are they involved? Who might be left out?
- **context** - is the method a controlled or 'in the wild' approach? Or something in between?
- **human factors** - which human factors does the method address?
- **focus** - what question(s) does it help us answer about the technology?
- **data gathering/analysis** - is it qualitative or quantitative? Is it important for the results to be generalisable, or is the aim to provide a rich descriptive account?

Then for *5 minutes* discuss: what does this method address? What does it miss out that might be important for this technology? What is the value of this method/approach? What are the limitations of this method?

Switch the presenter and repeat!

Further reading suggestions

D'ignazio, C., & Klein, L. F. (2023). *Data feminism*. MIT press.

Friedman, B. (1996). Value-sensitive design. *interactions*, *3*(6), 16-23.