

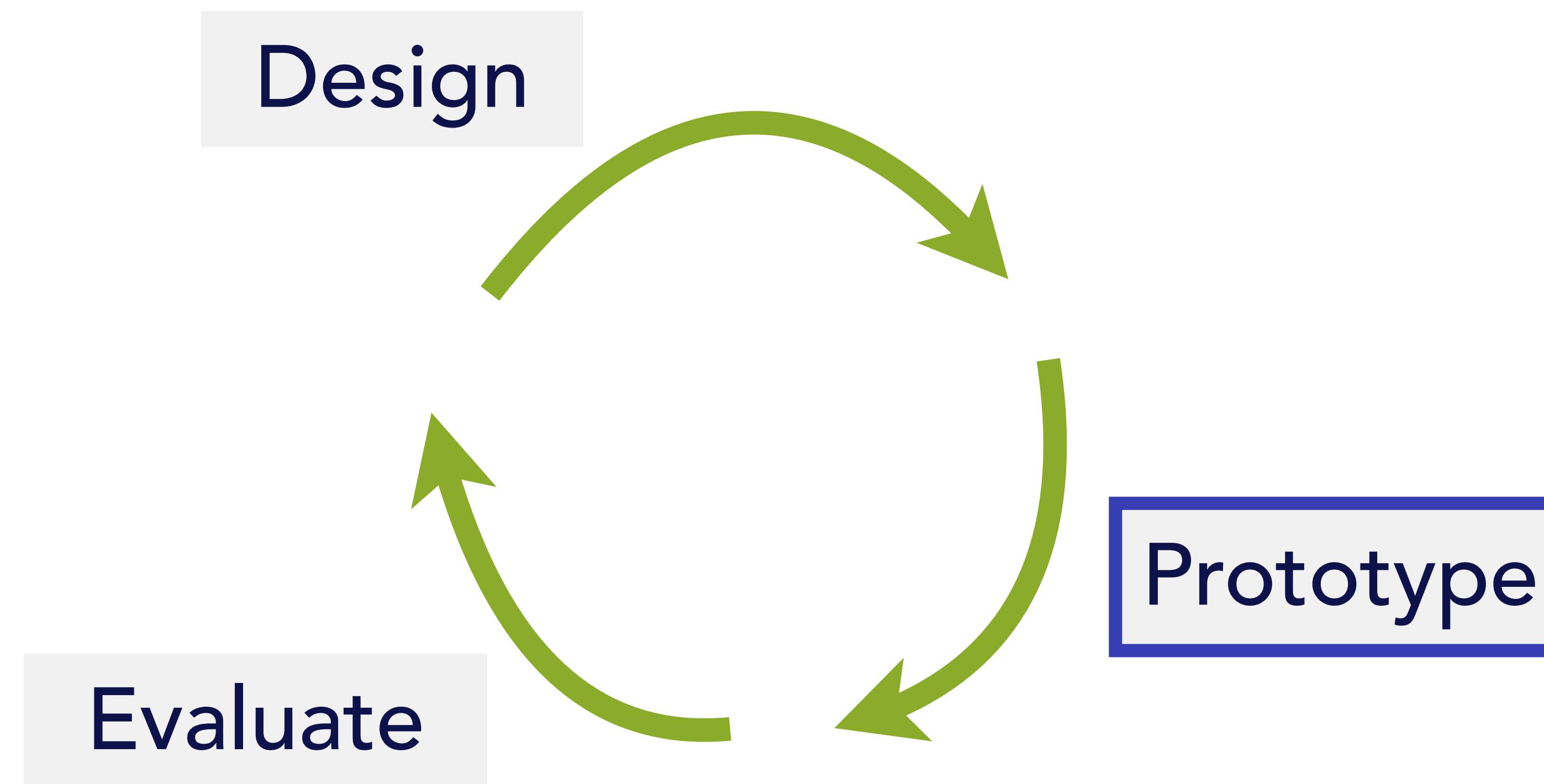
Needfinding

CS378 Intro to Human Computer Interaction

Hall of Fame (👍) or Shame (👎)



Prototyping Review



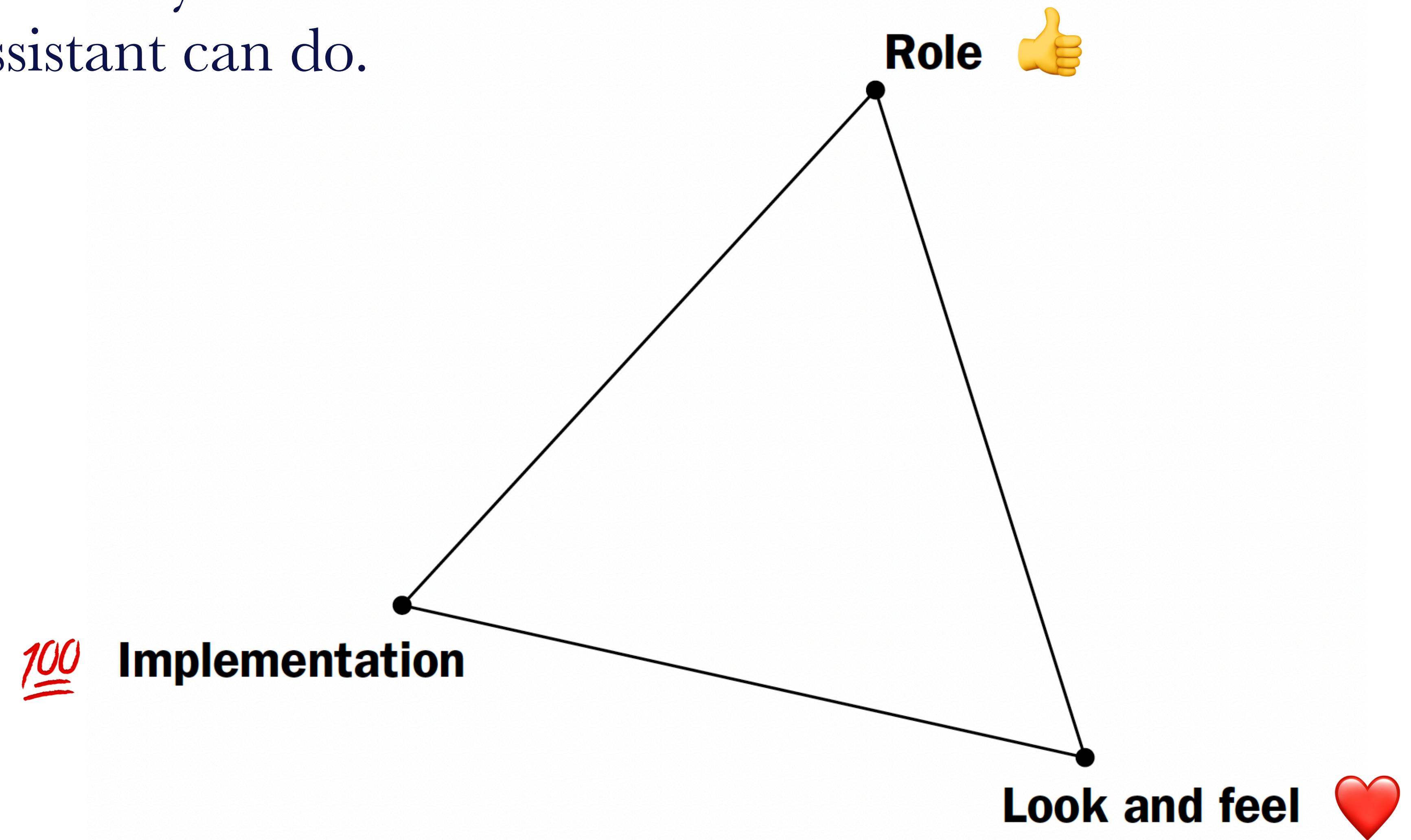
How would you prototype...

A robotic home assistant:

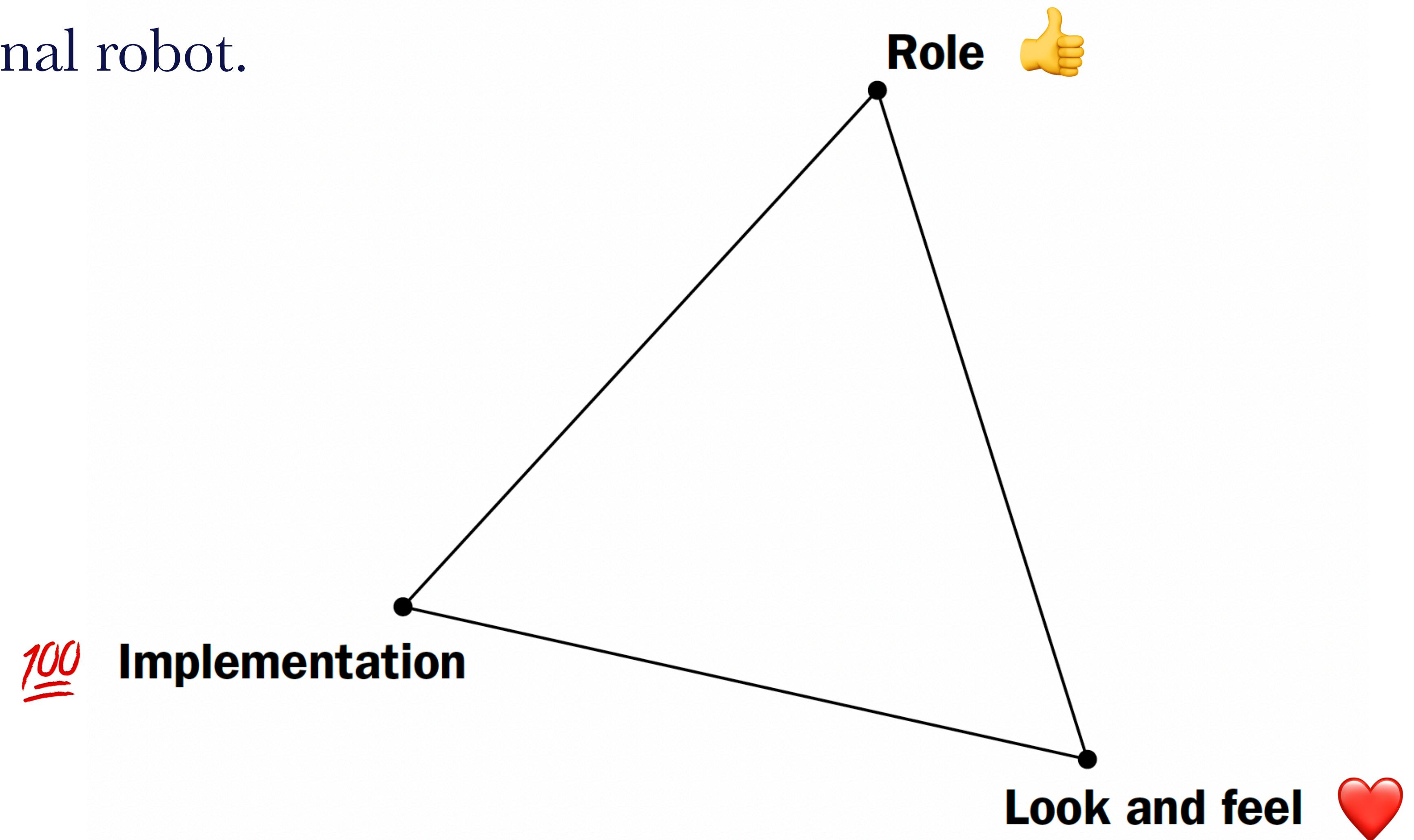
- Lays out an outfit each day to wear. Look and feel?
- Picks clothes off of the ground. Implementation?
- Folds clothes. Role?

What questions does your prototype answer?

An actor trained to do only the tasks that the robotic home assistant can do.



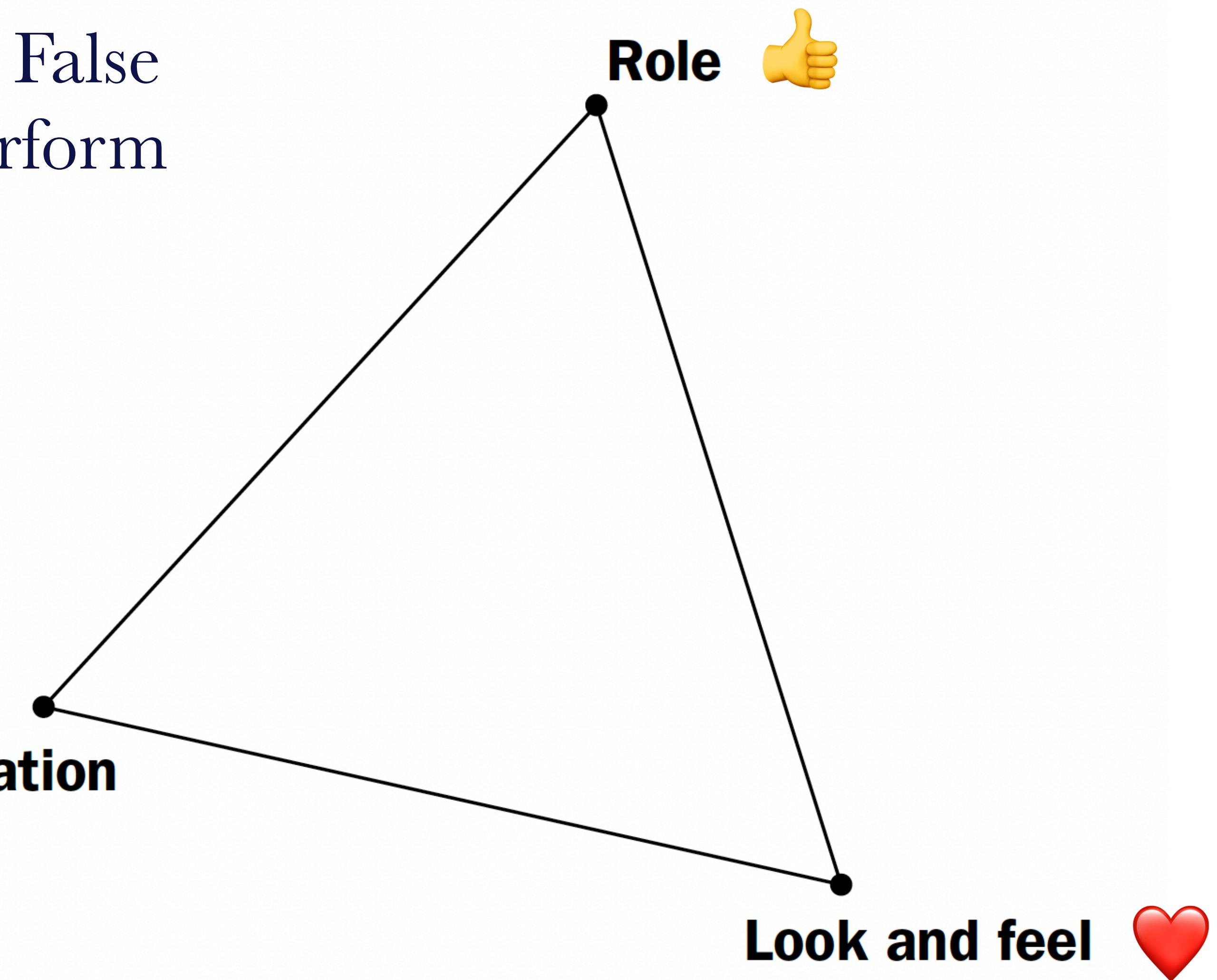
A cardboard box that is about the same dimensions as the final robot.



A terminal-based tool that takes in a text command and provides a True or False based on whether or not it can perform the task.

~~100~~

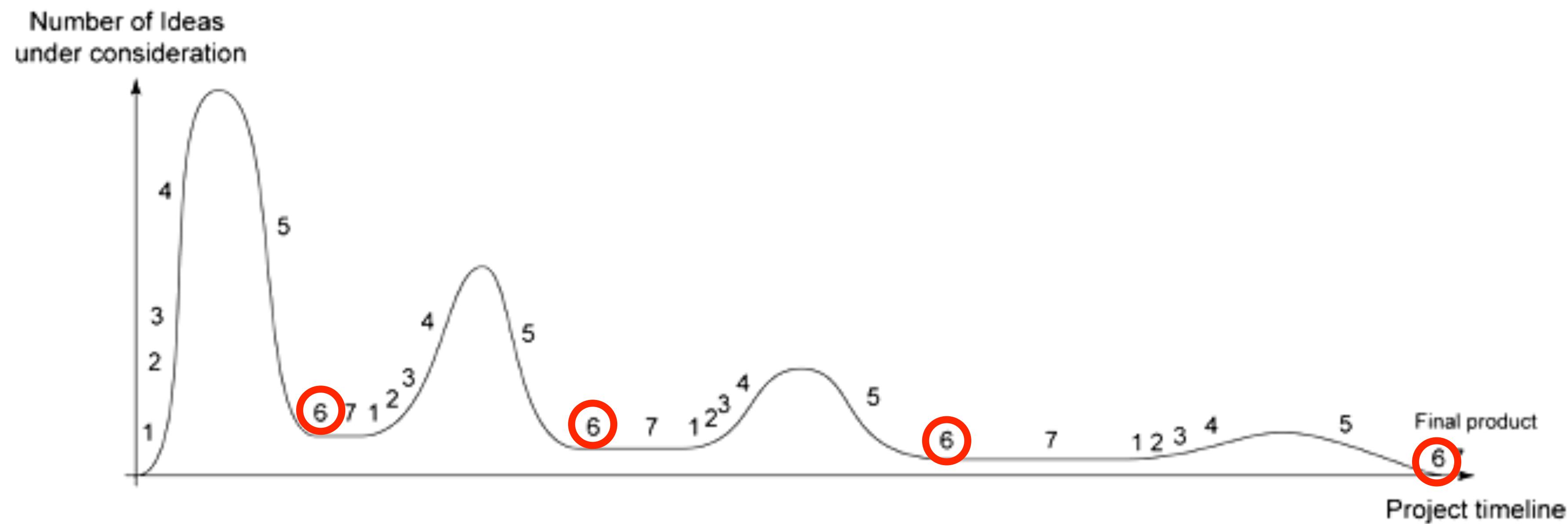
Implementation



Prototyping

Why do we prototype?

How do we decide what prototypes to create?

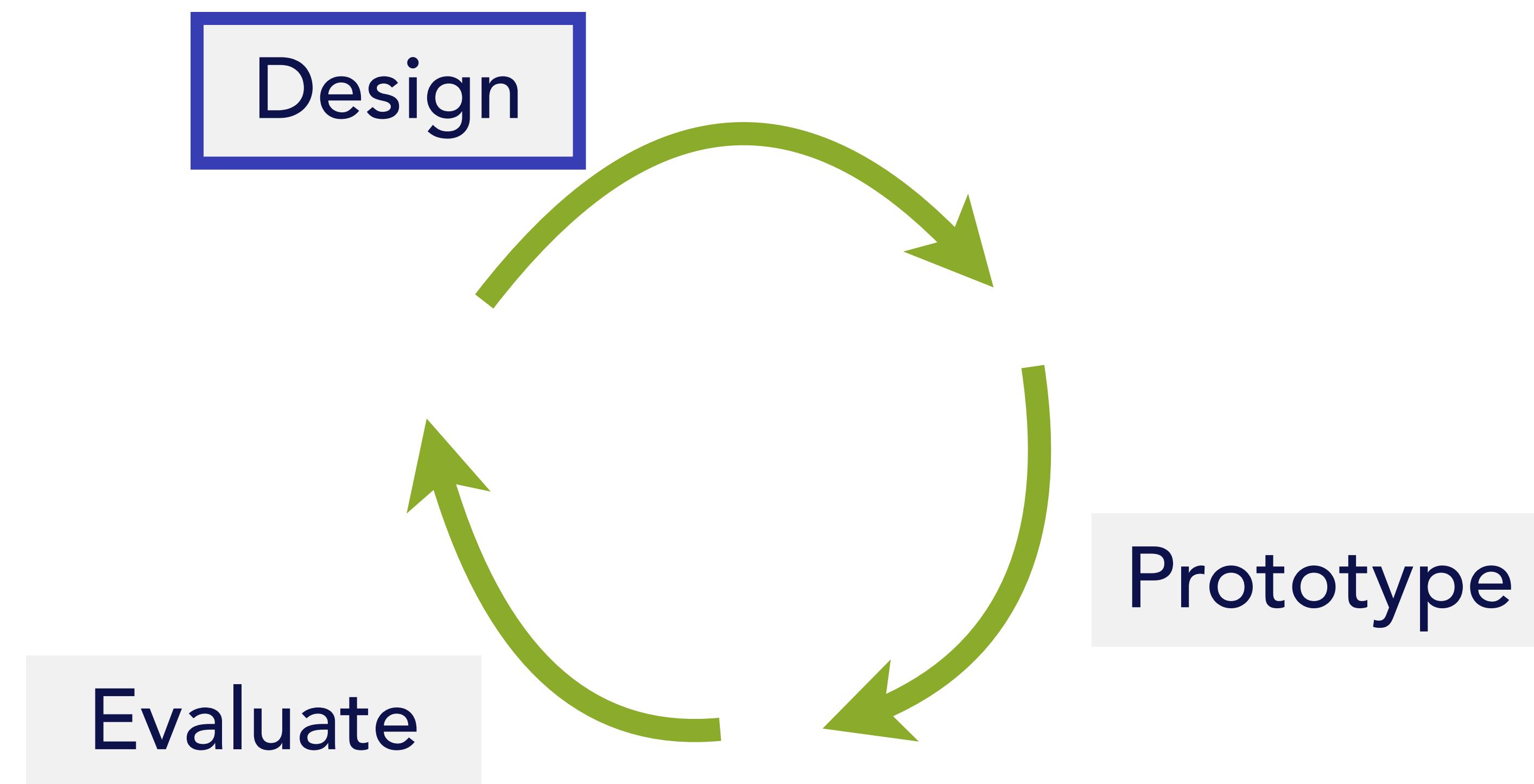


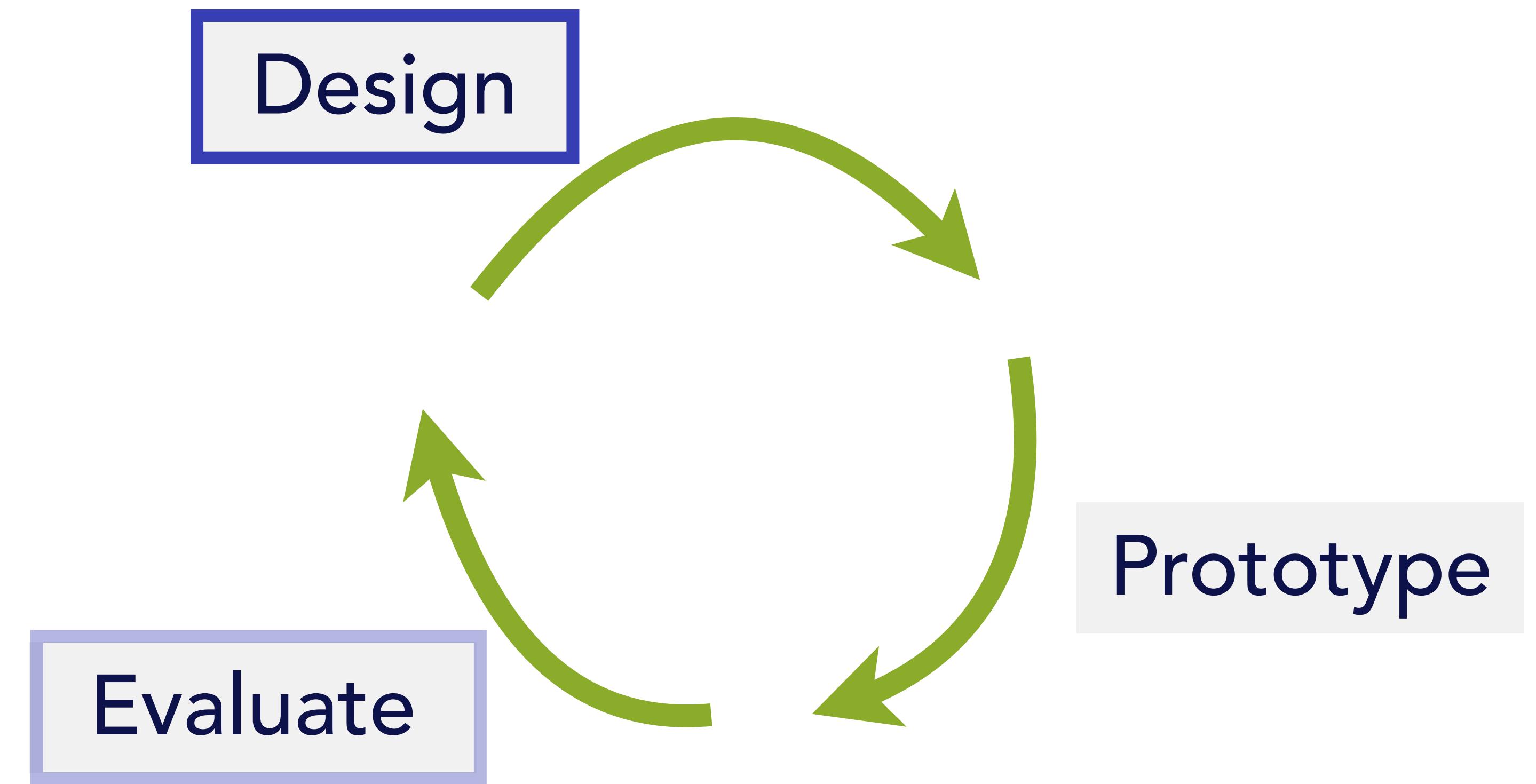
Observation

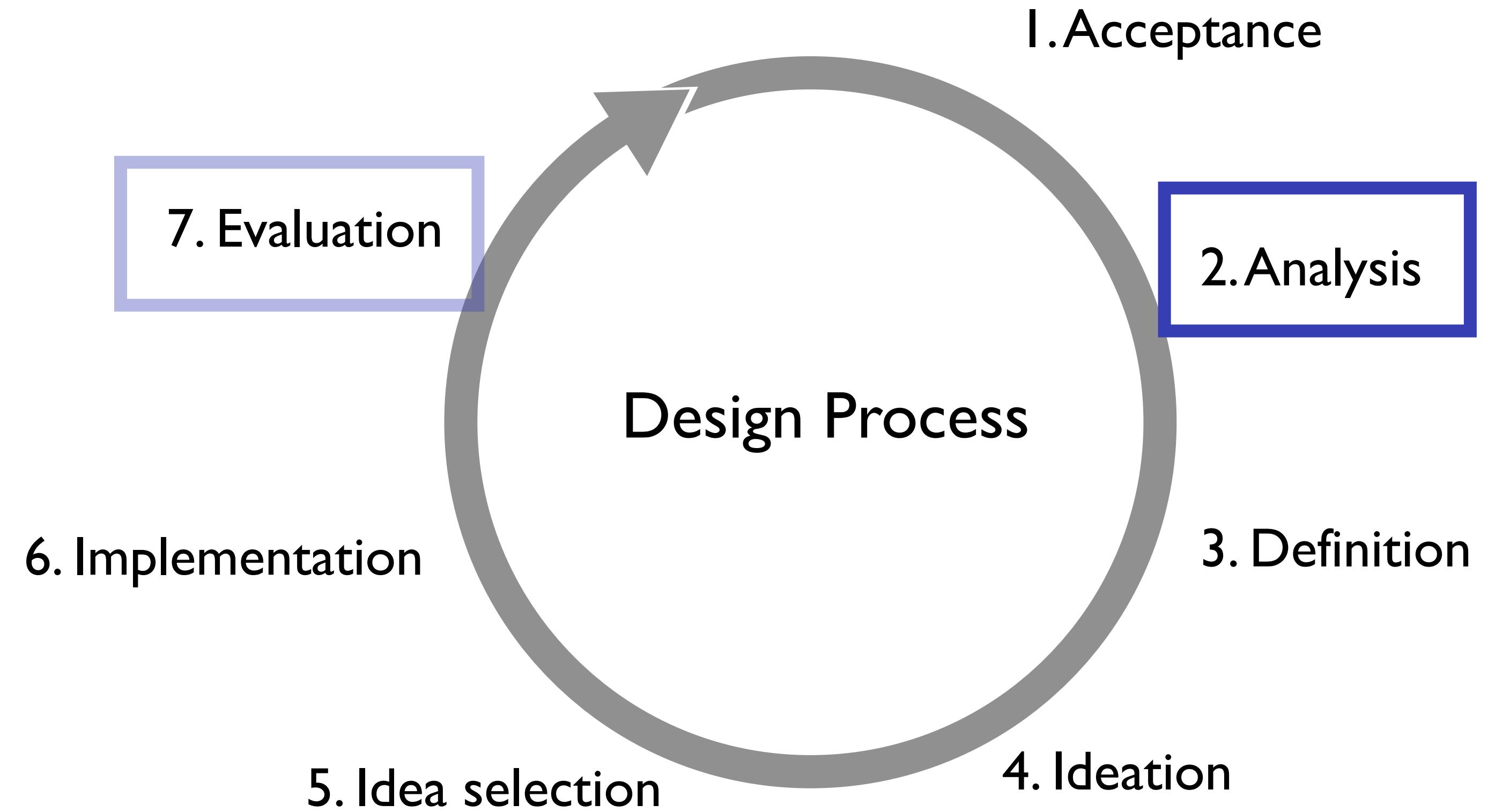
Interview

Conceptual Inquiry

This lecture







Investigation

"Do your homework"

Prior approaches

Articles/blogs

Needfinding

Observation

Interview

Observation



Observation

Key ideas

- Don't just trust your intuition to make design decisions.
- Observe target users in context to inform your design.

Observation

Key ideas

- Don't just trust your intuition to make design decisions.
- Observe target users in context to inform your design.

You can observe a lot by just watching.

— Yogi Berra

Xerox, CA 1983

Existing copiers judged as “too complicated” by customers.

But why?



Pushing the Green Button
(advertisement for the
8200 copier, c. 1983)

Xerox, CA 1983

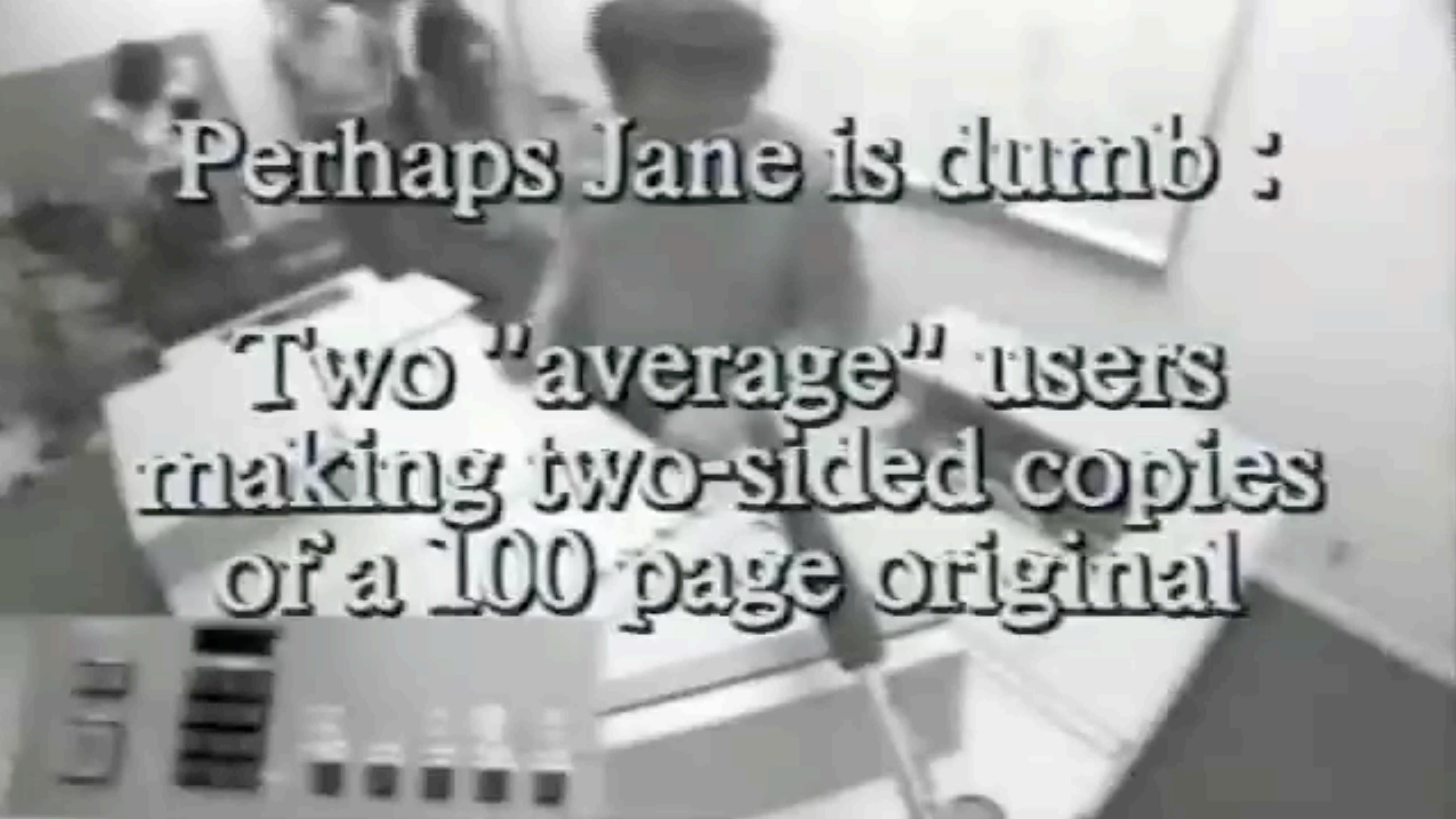
Existing copiers judged as “too complicated” by customers.

But why?

Lucy Suchman
UC Berkeley grad in Anthropology
at Xerox PARC suggests videotaping
interactions.



Pushing the Green Button
(advertisement for the
8200 copier, c. 1983)



Perhaps Jane is clutching:

Two "average" users
making two-sided copies
of a 100-page original

About those “average” users

Allen Newell

ACM Turing Award Winner

Unified Theory of Cognition

Ron Kaplan

Vice President and Distinguished Scientist at Nuance Communications

ACM Fellow, Chief Scientist at Powerset/Bing
Consulting Professor in the Linguistics Department at Stanford University



Observation showed that difficulties were not due to lack of sophistication of users, but due to problems “reading” (making sense of) an unfamiliar artifact.

Observation techniques

Ethnography

Task Analysis

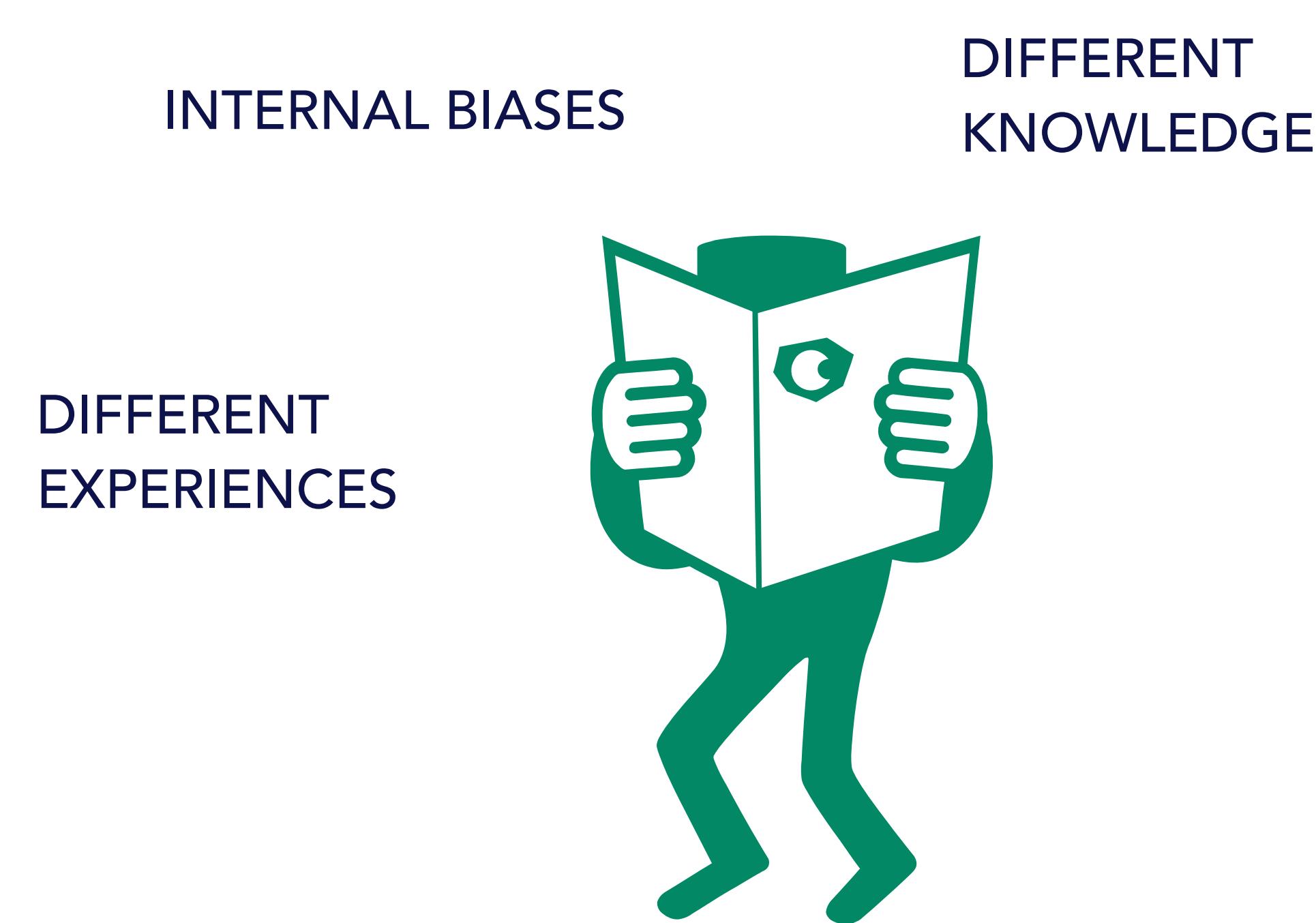
Contextual Inquiry

Diary Studies

Experience Sampling methods (ESM)

Autoethnography

Observation techniques



INTERNAL BIASES

DIFFERENT
KNOWLEDGE

DIFFERENT
EXPERIENCES

*DEPICTION OF A MYTHICAL
UNOBSTRUTIVE DESIGNER*

Needfinding Mindset

Observe and interview **without**
knowing what you are looking for,
and **discover** what is interesting.

Needfinding

Needs gaps within a system

Needfinding

Needs gaps within a system

Needfinding is discovering opportunities by recognizing those gaps

Needfinding



Needfinding



Needfinding

Needs gaps within a system

Needfinding is discovering opportunities by recognizing those gaps

Figure out the story of **what** and **why**

Tell a new one!

Observation techniques

Goal

Understand user's activities in context to inform (re-)design of information technologies and interfaces

“**in context**” go to a normal work environment

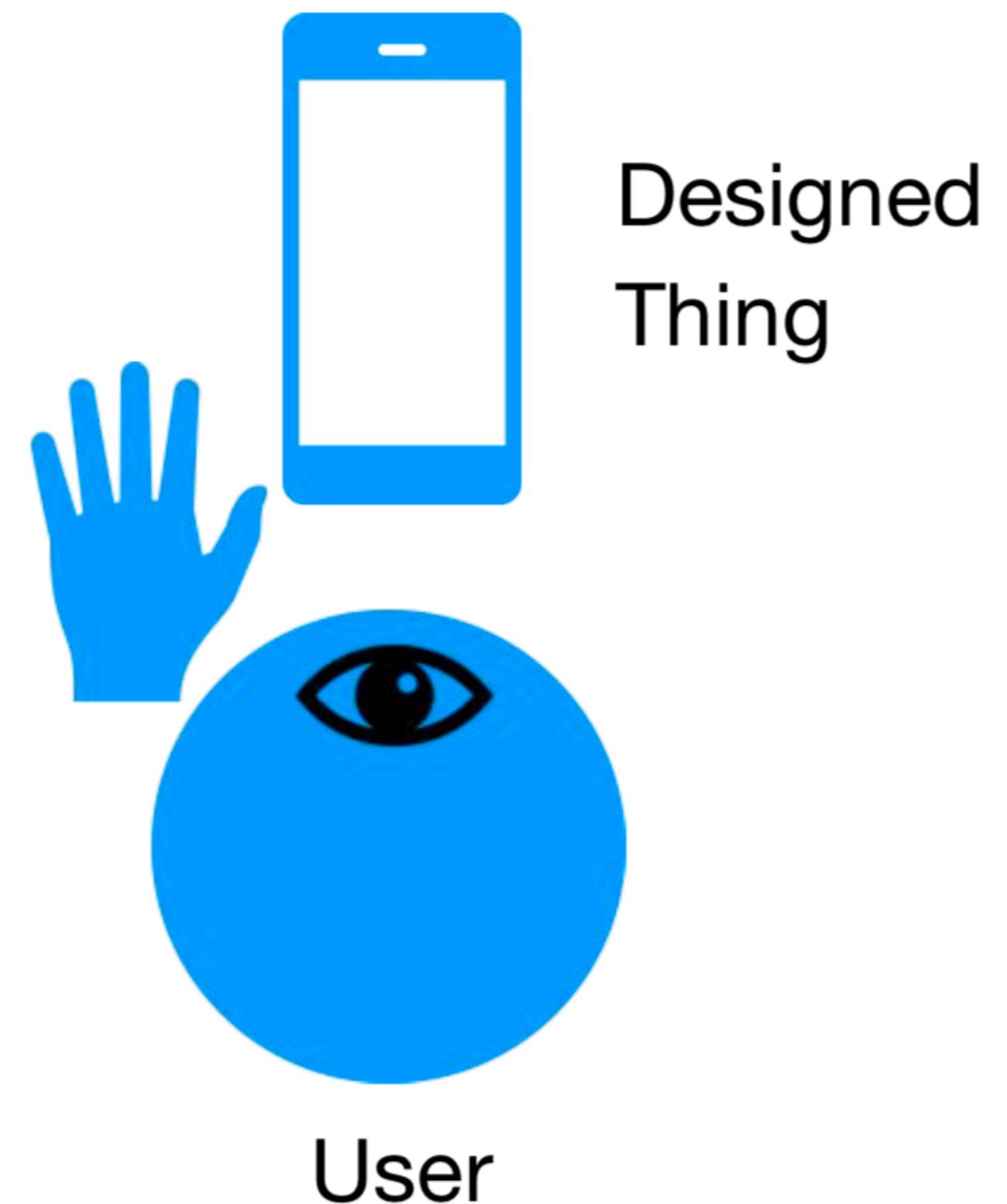
“**understand user's activities**” - Seek to understand their activities, even the inefficient ones. User's will often use tools in unexpected ways. Look for “work arounds”.

How to Observe

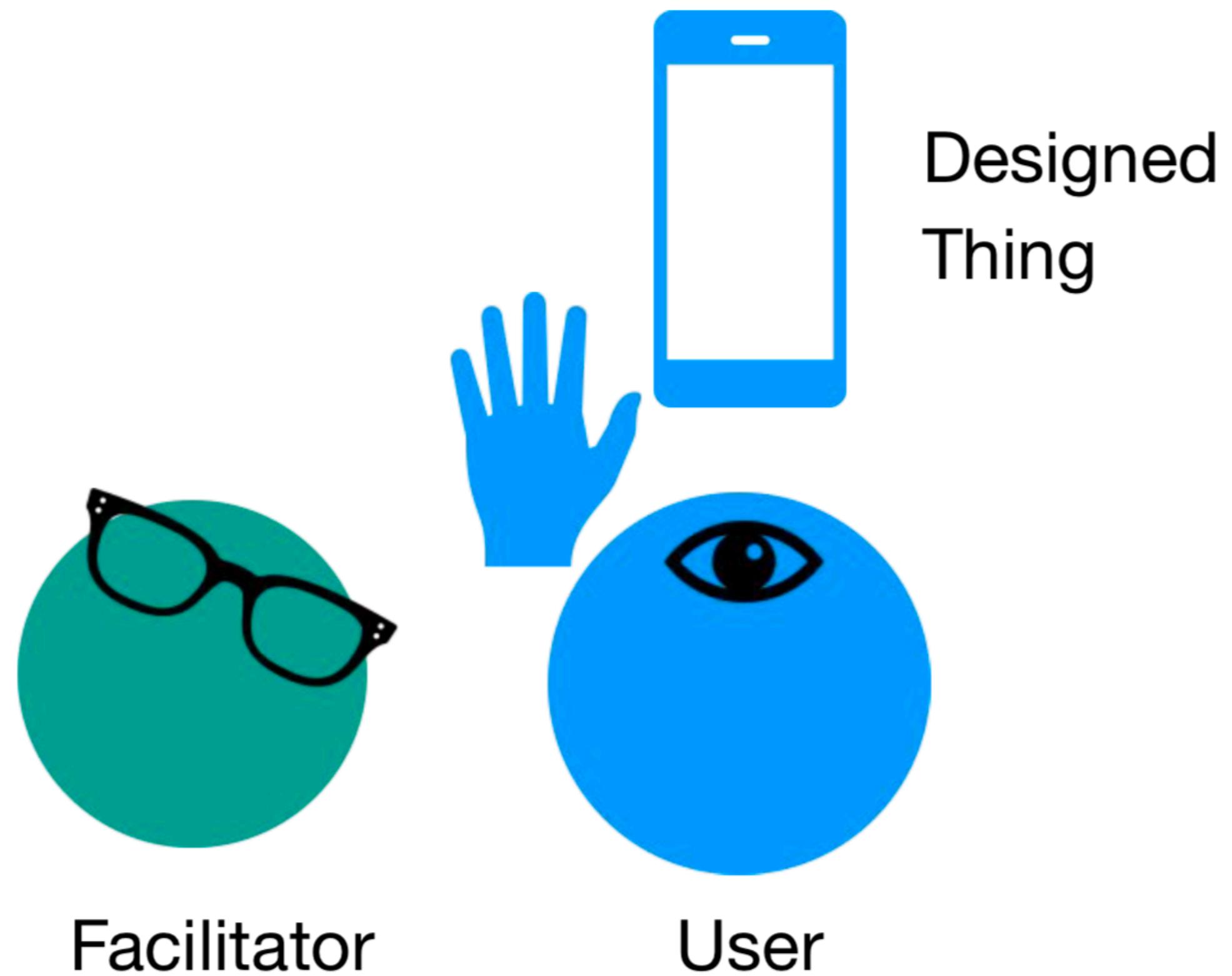


Designed
Thing

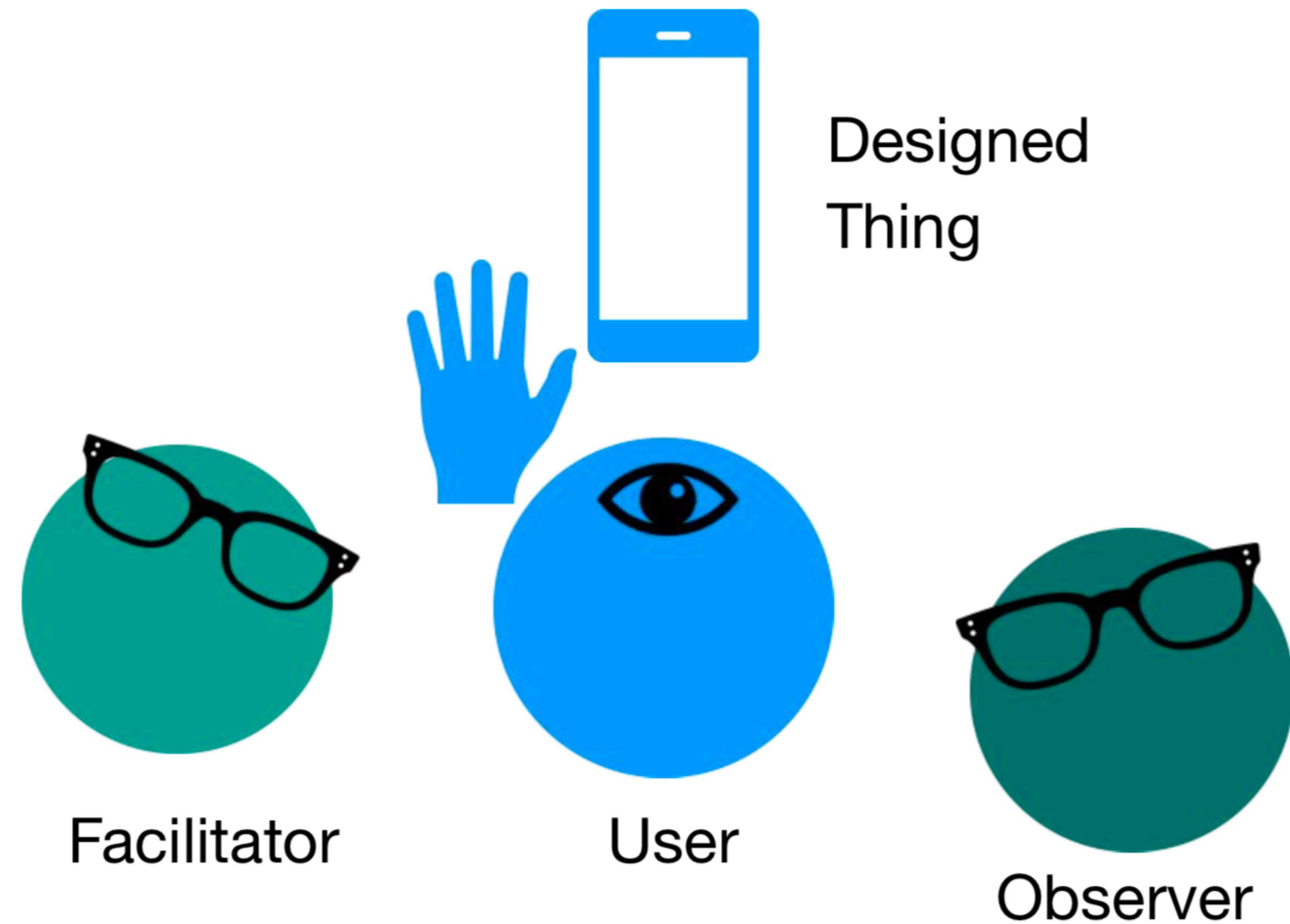
How to Observe



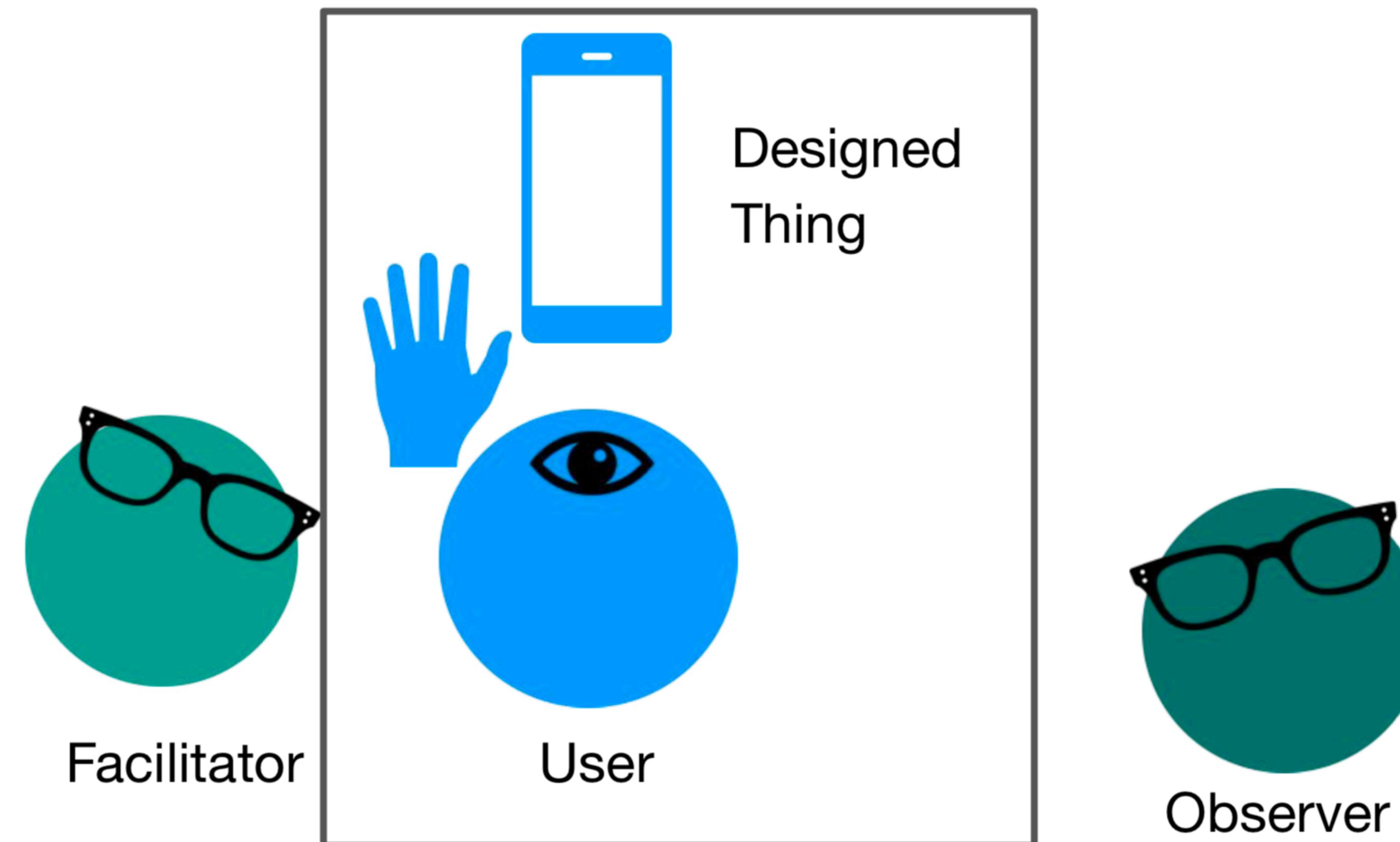
How to Observe



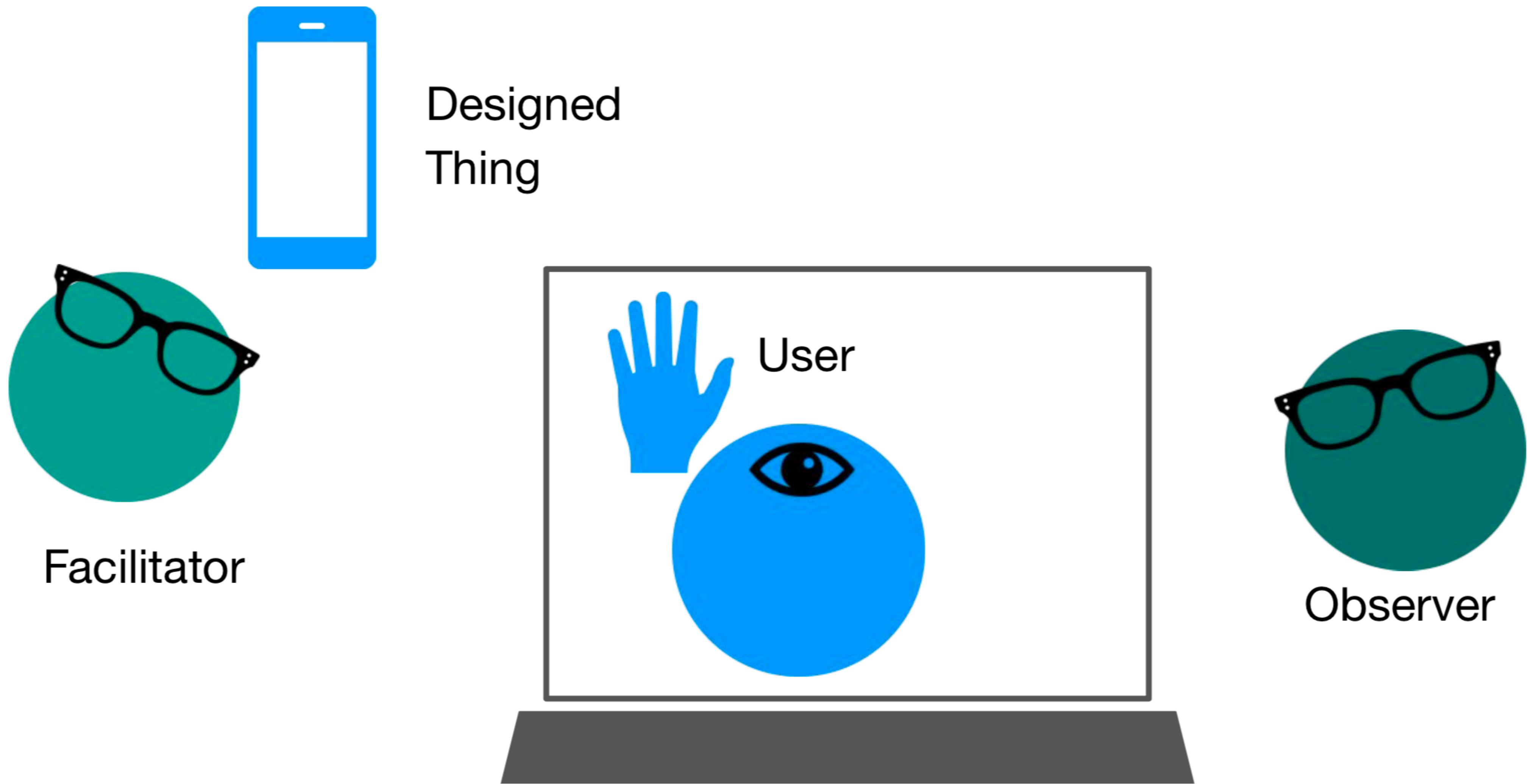
How to Observe



How to Observe

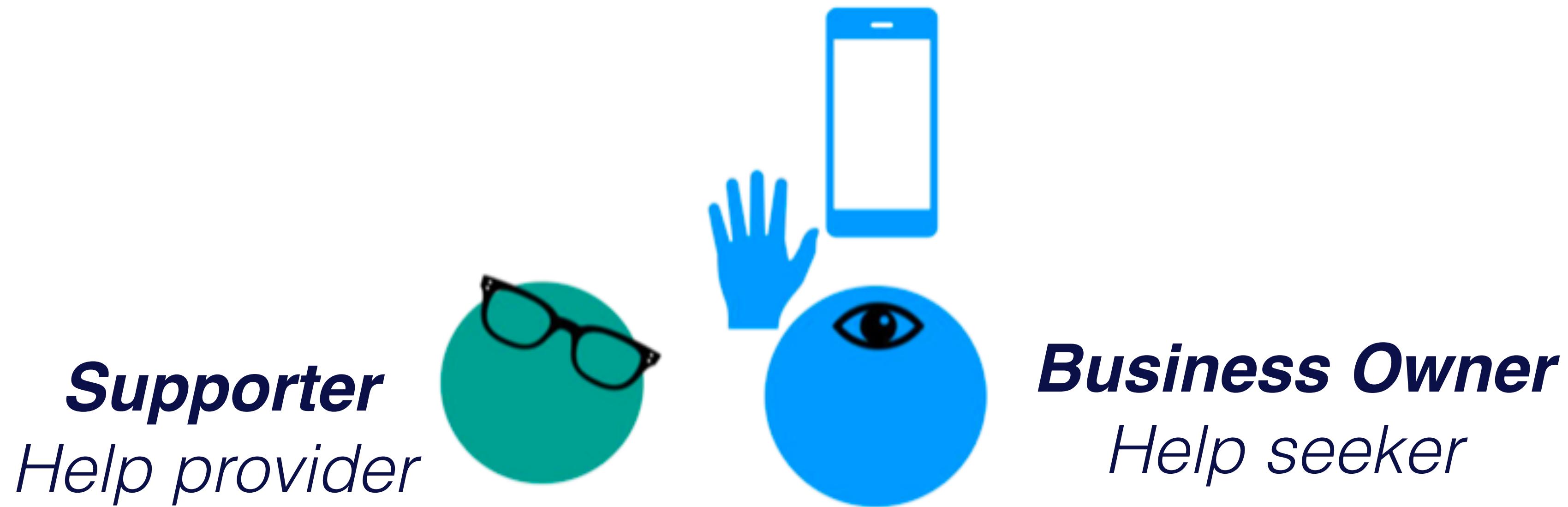


How to Observe



Observation Example

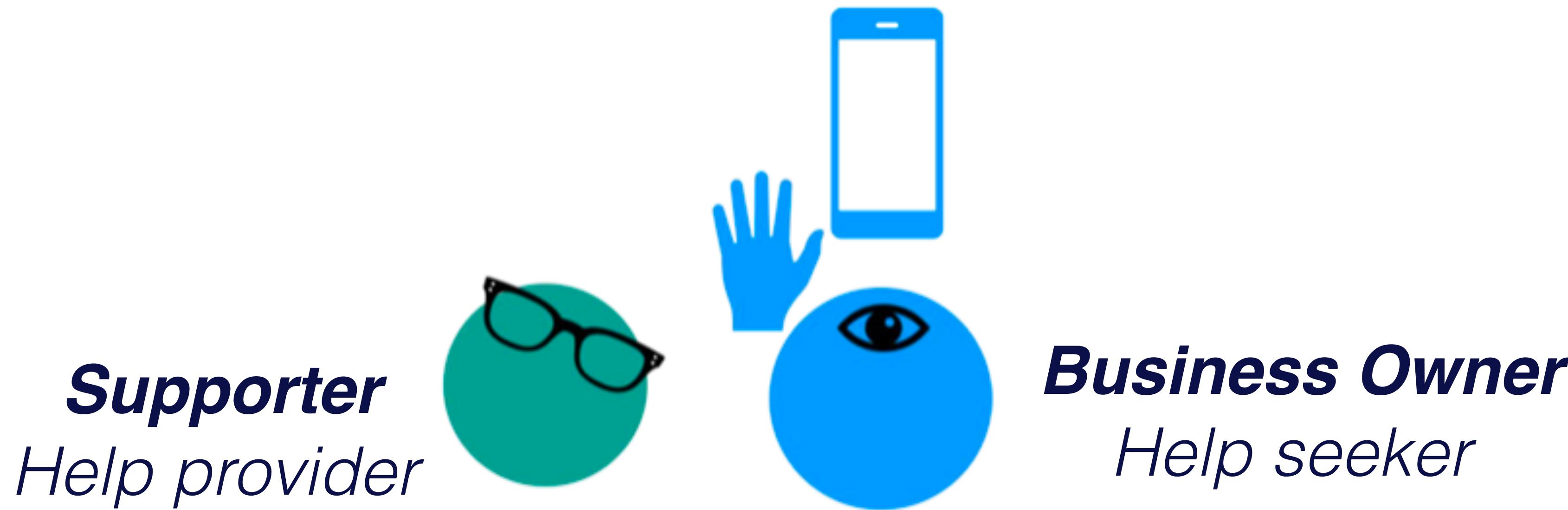
Technical Help



Stated (by user): Need to install software for running business remotely

Observation Example

Technical Help

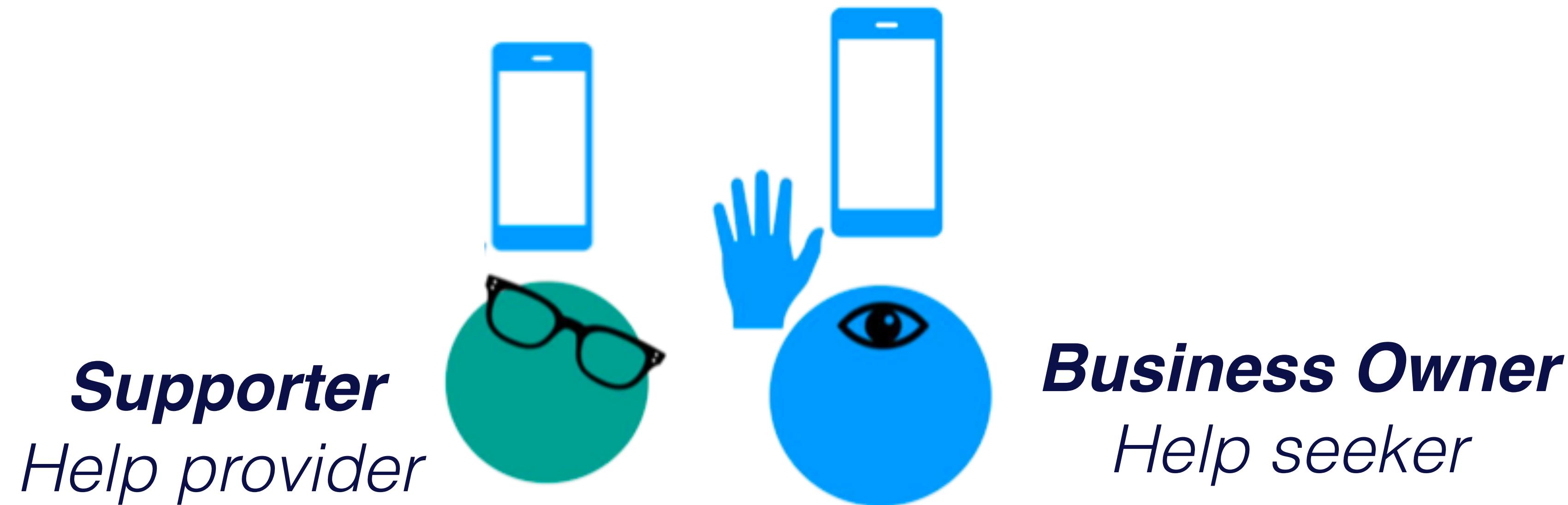


Stated (by user): Need to install software for running business remotely

Observed (by facilitator): Improve computer efficiency by clearing files

Observation Example

Technical Help



Stated (by user): Need to install software for running business remotely

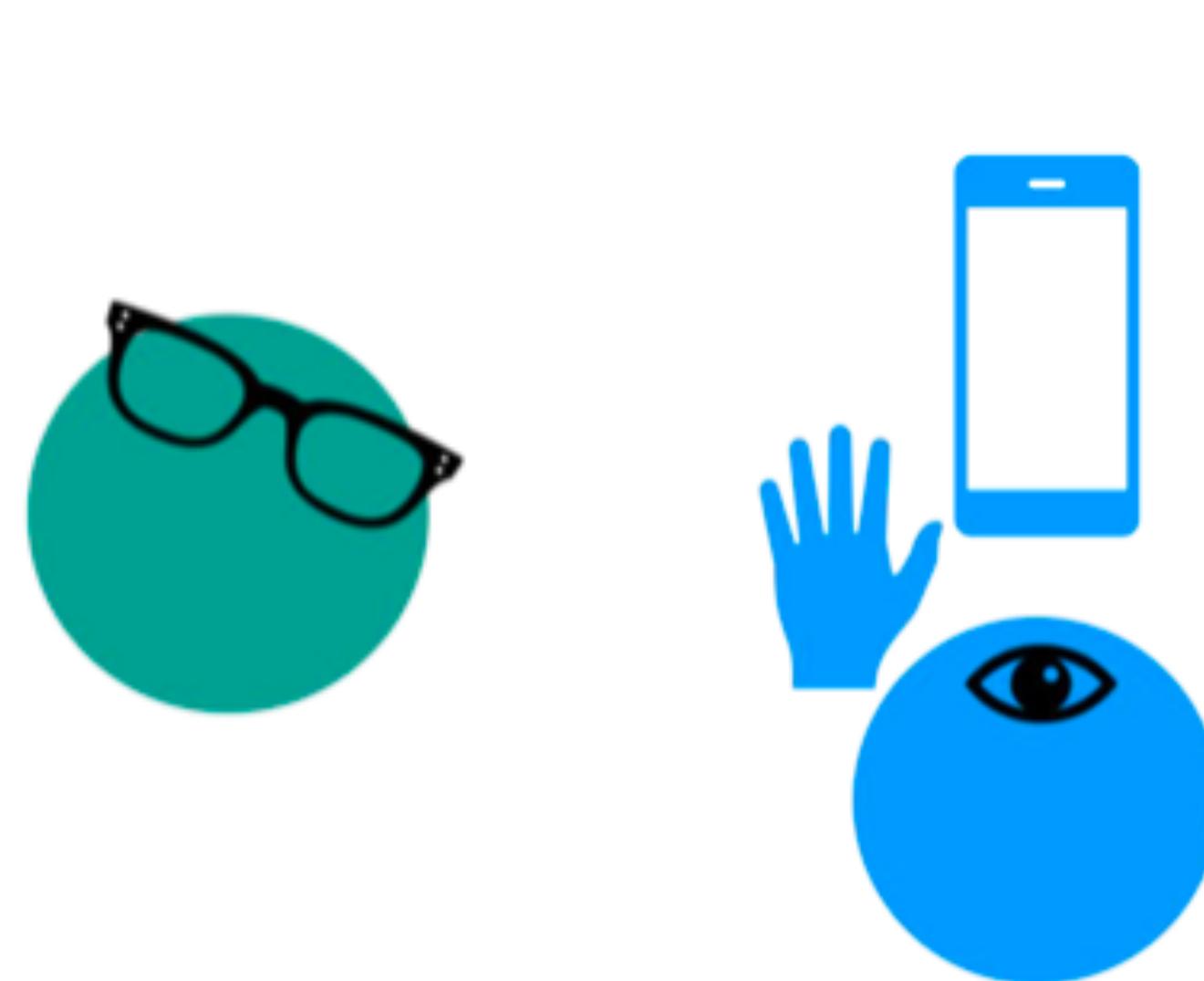
Observed (by facilitator): Improve computer efficiency by clearing files

Observed (by user): Improve ability to navigate files

Observation Example

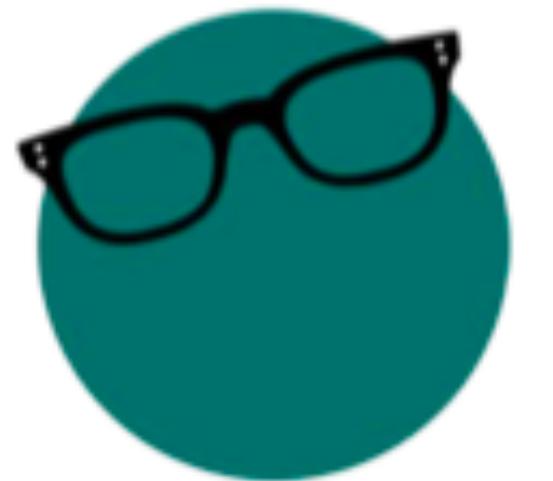
Augmentative and Alternative Communication

Interviewer



**Close
Conversational
Partner (User 2)**

**Augmented
Communicator
(User 1)**



Observer

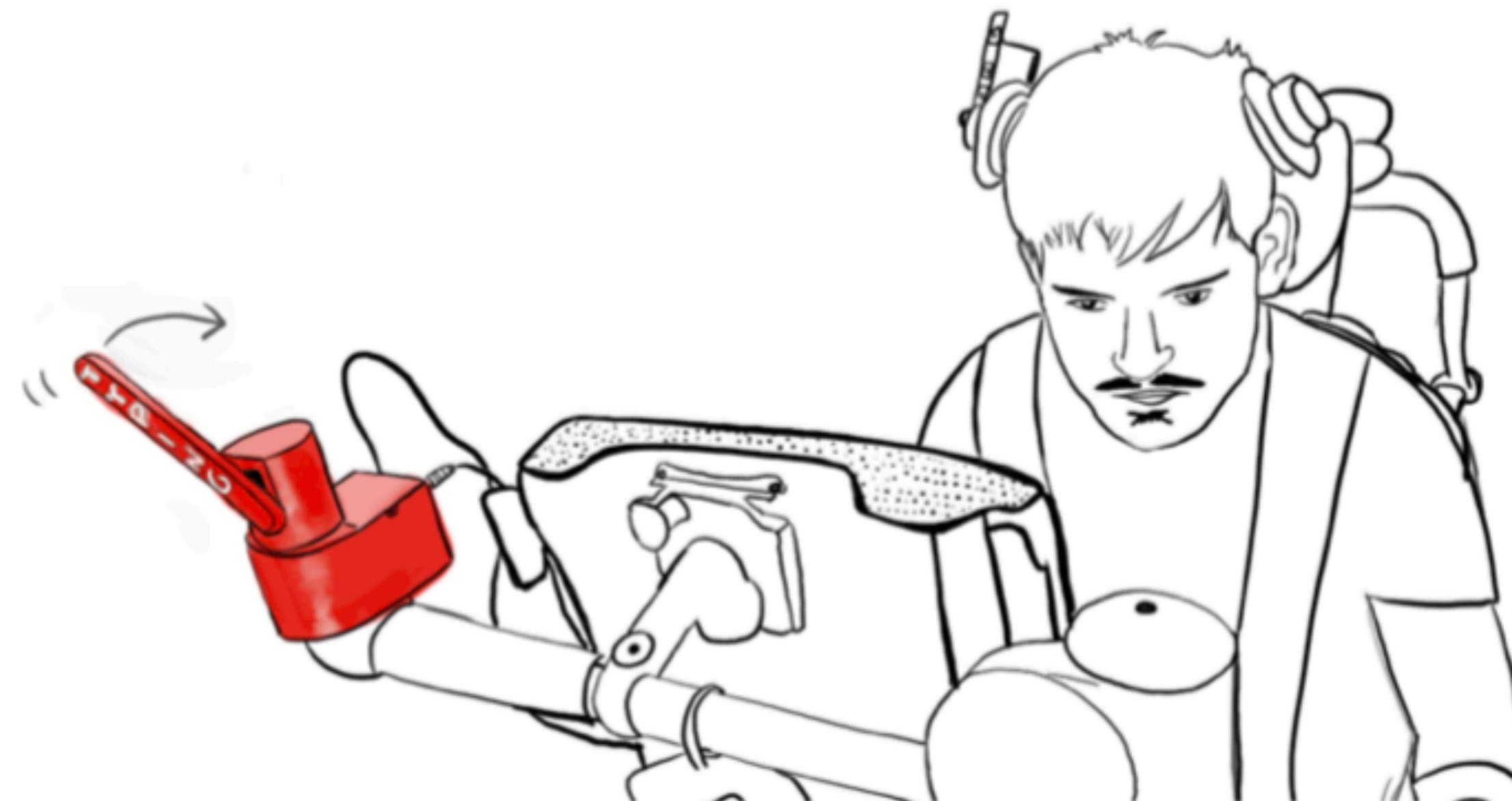
Previous focus: Make communication device faster

Observed: Other people change topics too quickly

Opportunity: Use another approach to make people slow down!

Observation Example

Augmentative and Alternative Communication



*From Valencia et al. “Aided Nonverbal Communication
through Physical Expressive Objects”*

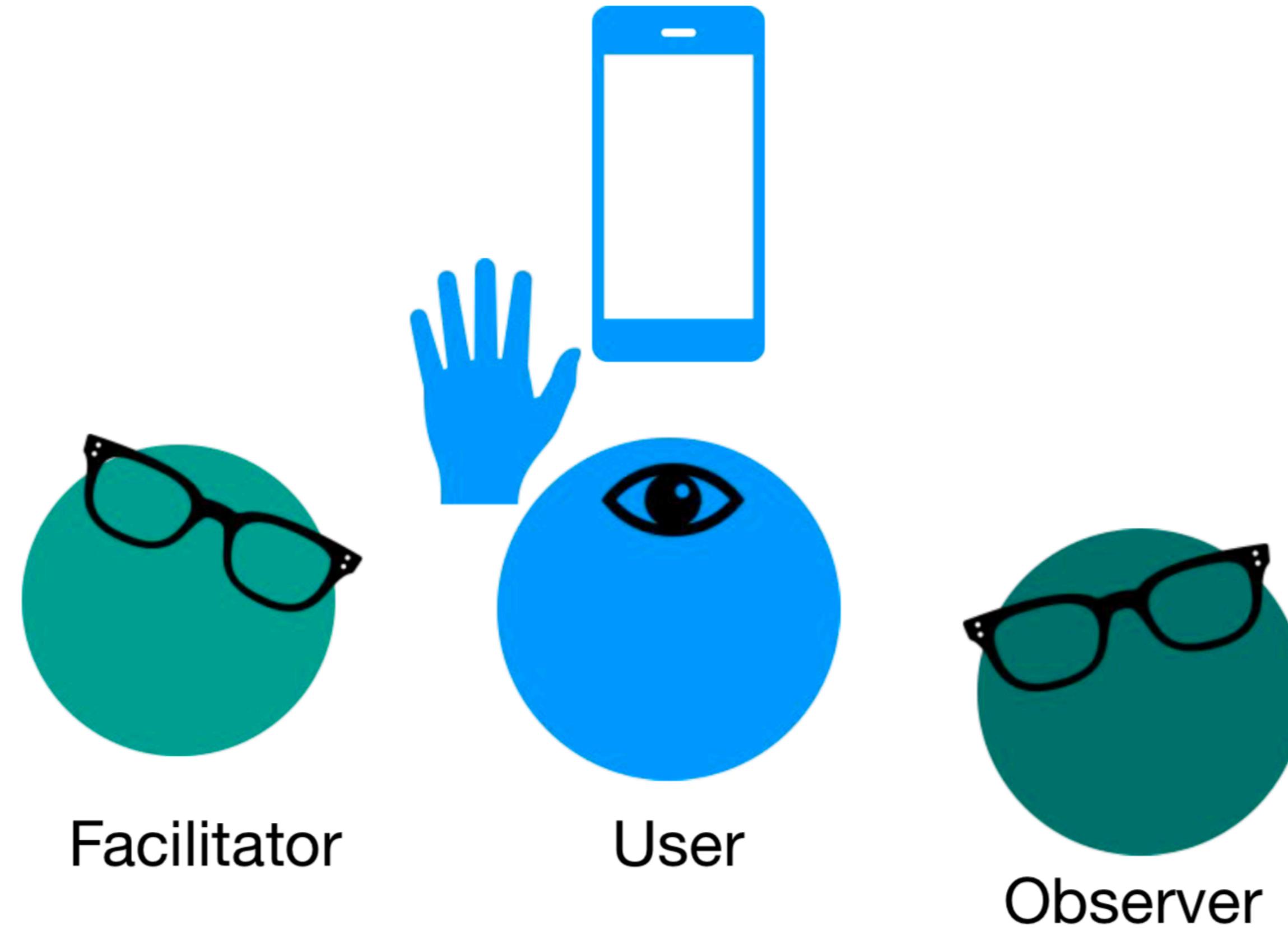
Observation tips

Pay attention to all the artifacts

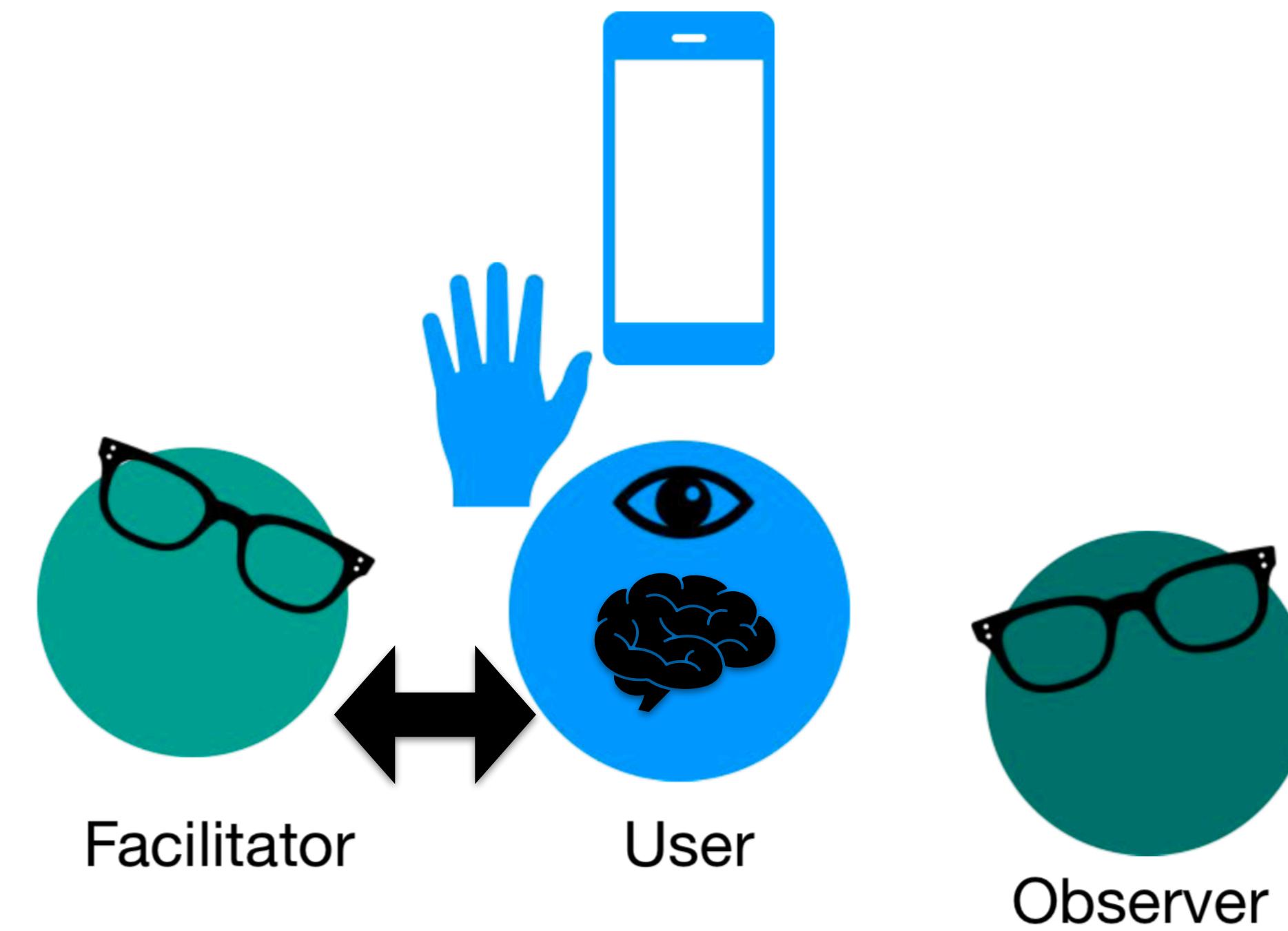
Look for workarounds and hacks

“Errors” and repetitive actions are a goldmine

What if watching isn't enough?



What if watching isn't enough?



what is the user doing? what are they thinking?

sometimes, watching performance isn't enough

Contextual Inquiry

Contextual Inquiry is observation and collaborative interpretation performed in-context to uncover hidden insights

Context. Natural environment > labs or conference-rooms settings.

Partnership. The user and researcher are partners in understanding the work. Both parties direct the conversation.

Interpretation. The researcher develops a comprehensive and shared interpretation for all important aspects of the work (e.g., via feedback).

Focus. The researcher should understand the purpose of the research to guide the observation and the interviews during sessions.

OBSERVE LIKE AN APPRENTICE



Sometimes watch, sometimes probe

OBSERVE LIKE AN APPRENTICE



How did you decide to...?

I saw ____... Am I
understanding this right?

Sometimes watch, sometimes probe

BENEFITS OF MASTER-APPRENTICE RELATIONSHIP

Allows user to teach us what they do

- Skill knowledge is usually tacit (can't put it in books)
- Sometimes literal apprenticeship is best



Interviewing

Needfinding Interview

Start with basic questions about experience

Move from **close** to **open ended questions**

Move from **what** to **why**

Move from **actions** to **feelings**

Needfinding Interview

The interviewee should speak **90% of the time**

Make time for silence and answers will come

Needfinding Interview

The interviewee should speak **90% of the time**

Make time for silence and answers will come

This is awkward, but I promise it works!

Needfinding Interview

Beginners mindset and be curious

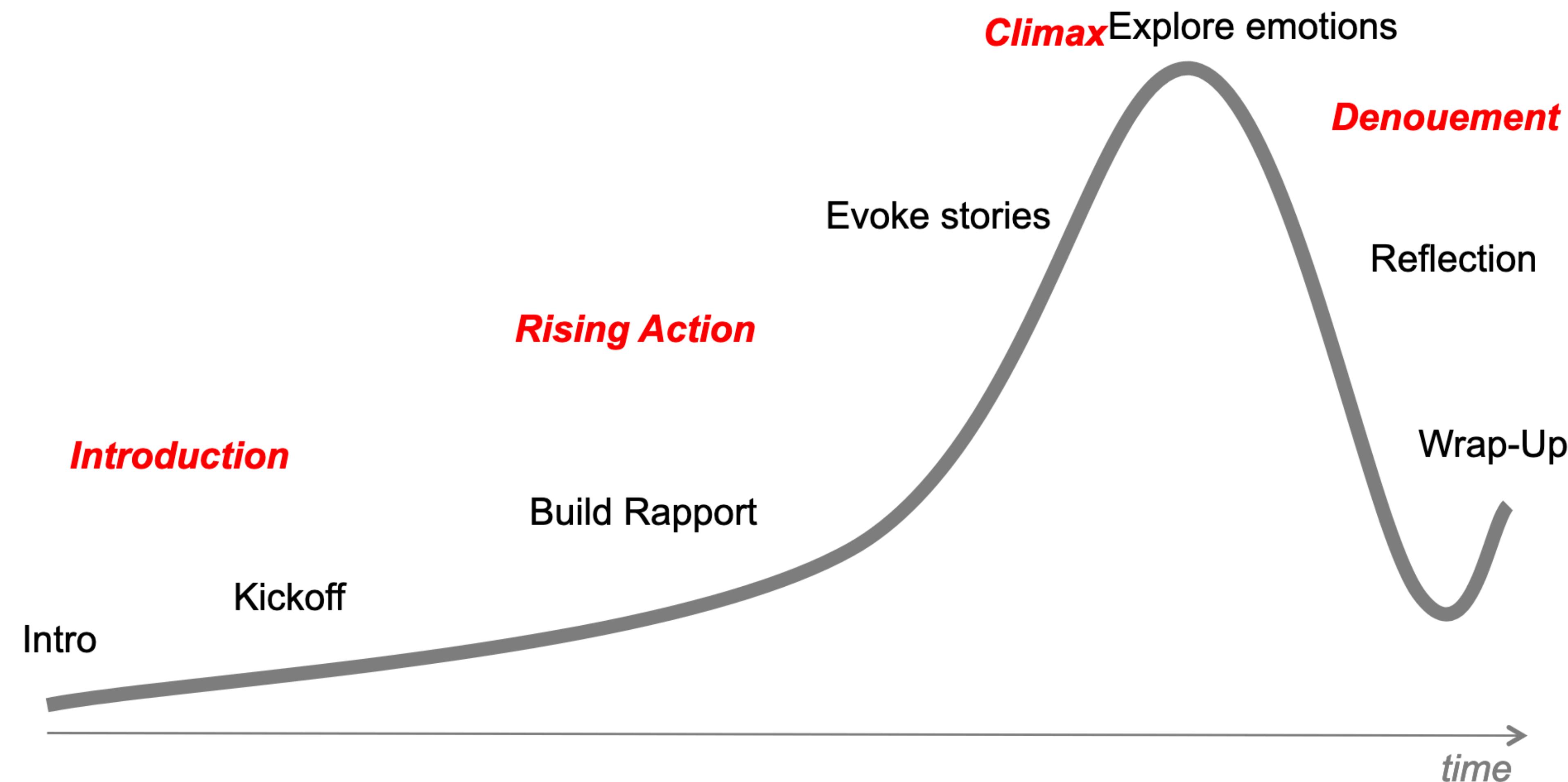
Engage in their environment

Needfinding Interview

Prepare a set of questions ahead of time

But also, prepare to **veer**

Needfinding Interview Structure



Kickoff



- **Background**— “Tell me about what you do here.”
- **Sequence** — “Walk me through your day yesterday...then what do you do next?”
- **Physical tour** — Take me on a tour of how you build the panels...”
- **Virtual tour** — Walk me through your sales process from the beginning...“
- **Participation** — “Can you show me exactly how you prepare a bid for a customer?”
- **Exhaustive List** — “What are all the different municipalities where you sell?”

Build Rapport



- **Naïve Outsider Perspective** — “I’m not from Southern California, tell me how the housing market works here.”
- **Quantity** — “How many of your competitors fall into that category?”
- **Changes Over Time** — “How are things different than they were a year ago?”
- **Tasks and organizational structures** — “Can you draw me a diagram of the organizational chart of your company?”
- **Native Language** — “Why do you call your office ‘the command post’ ?”
- **Reflecting Back** - “So, what I hear you saying is..... is that right?”

Stories and Emotions



- **Peer Comparison** - “Do your colleagues share your sales techniques?”
- **Other Viewpoint Comparison** - “What would other solar owners think about that?”
- **Clarification** - “...and when you say ‘I’m a closer,’ what do you mean exactly?”
- **Characterization and Comparison** - “Could you characterize your sales style and compare it to Mike’s?”
- **Success and Failure** – “Describe your most successful sales call. Now tell me about a sales call that was an absolute disaster.”

Reflection



- **Point to Their Reaction** - “Why do you roll **your eyes when you say that?**”
- **Suggestive Opinion** - “Some people have very negative feelings about emotional, non-technical sales pitches in the solar industry. What are your feelings about it?”
- **Contradictions** - “You tell me you can sell ice cubes to Eskimos but you also tell me you have a deep concern for your customers, how do these two work together?”

Pitfalls

“How do you get your contacts for potential sales? Does your boss share a list with you?”

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“When I sold girl scout cookies, I always made sure to revisit the houses that had bought from me previously and contact people I knew first, but I tried to delegate half of my time for trying new houses. However, this only had a 5% success rate. Because of that, I was wondering how much time do you spend cold calling vs. following up with known contacts?”

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“When do your colleagues decide to follow up with known contacts?”

Pitfalls

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“When do your colleagues decide to follow up with known contacts?”

“What if I designed a tool that makes it easier to keep track of your sales calls by extracting important information rather than making you enter it manually?” or “What would you do to fix your ice cube problem?”

Needfinding Interview Logistics

An **interviewer** and a **notetaker**

Collect **artifacts** from their process (e.g., for a costume designer: mood boards, fabric swatches, feedback emails from their team)

In person: Take **pictures** of the environment

Record the interview! Consider recording with a tool that provides an automated transcript.

Activity

You've been hired by UT Austin to redesign the process of planning and signing up for courses!

Form a group of 3 (a participant, an interviewer and a notetaker)

After 5 minutes, switch roles.

Reflection:

What was one interesting insight or story?

What **worked well** during the interview?

What **was one part of the interview that could be improved?**

Activity

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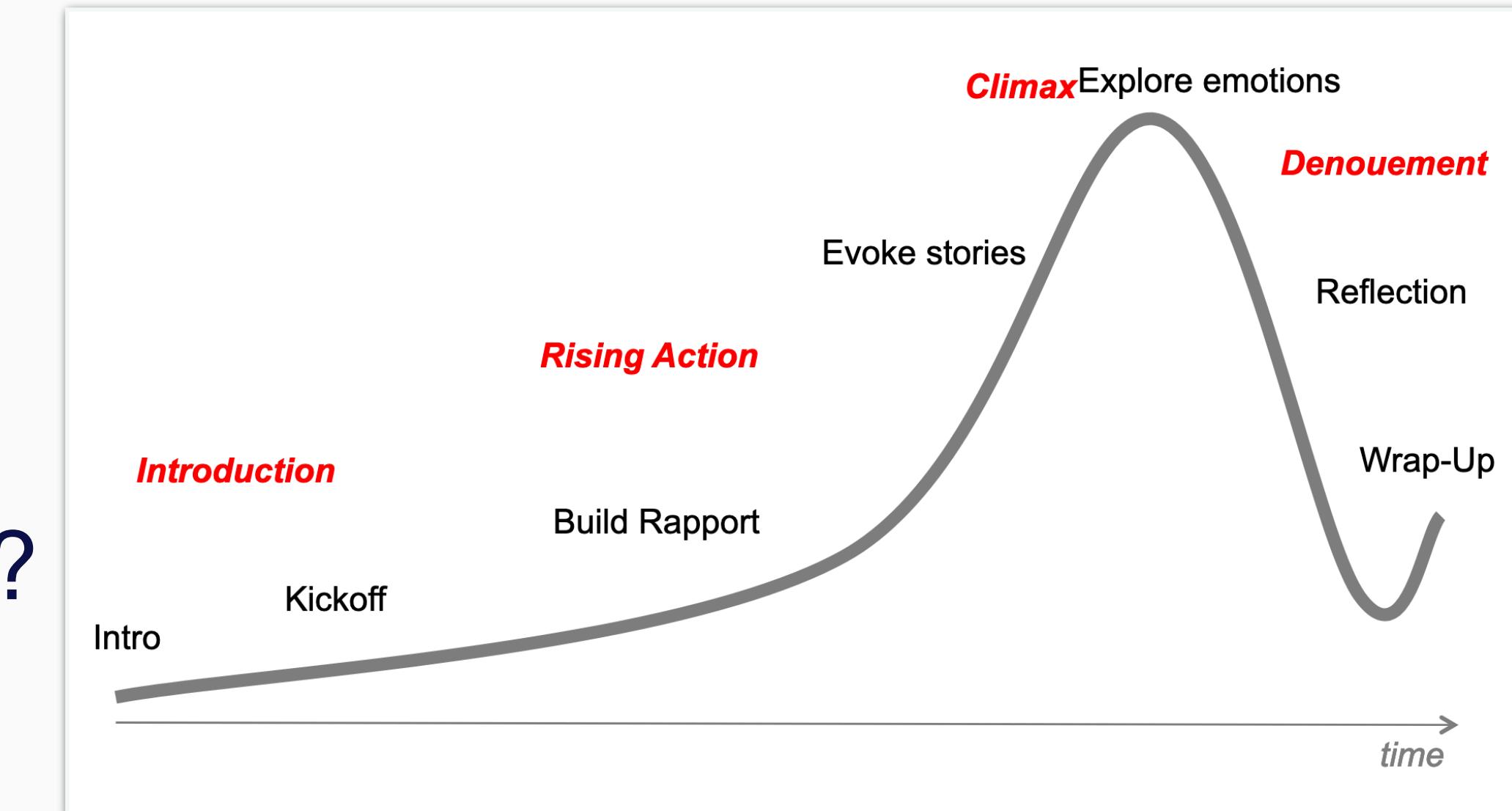
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Reflection:

What was one interesting insight or story?

What **worked well** during the interview?

What **was one part of the interview that could be improved?**



Participants

How do you decide who participates?

Users should be **representative** of your target users
(vs. a *convenience sample*)

Consider **multiple sides** of an interaction
(e.g., grocery store clerk, owner, and customer)

Consider **extreme users** (e.g., first time grocery shopper, a person who uses a wheelchair, a professional shopper)

Consider who's perspective is **missing**

Usually 6-16 people for 30-90 minutes each
(considerations: depth vs. breadth, repeating findings)

How do you recruit participants?

Depends on target users

In person at the location of interest

Social media: Twitter, Instagram, Facebook, BeReal (?)

Local email lists or social media groups (e.g., WeChat groups)

Snowball sampling

Outside of this class: Paid platforms (MTurk, Prolific, Upwork)

How do you get people to participate?

Strategy: Student card (“I’m a student” gets you way further than you would think, use it while you still can!)

Strategy: Just ask (see *the liking gap*) people are typically more willing to participate or help out than you would think!

Strategy: Be upfront about requirements and benefits (e.g., amount of time, location, help us learn about...)

Synthesis

What do you share?

You've uncovered a surprise or found something that is missing

You've found out **why** people do **unusual things**

You **want** to share with others!

Formal strategies exist to try and mitigate impacts of bias
(e.g., **qualitative coding, thematic analysis**)

What do you share?

Photos

Quotes

Stories

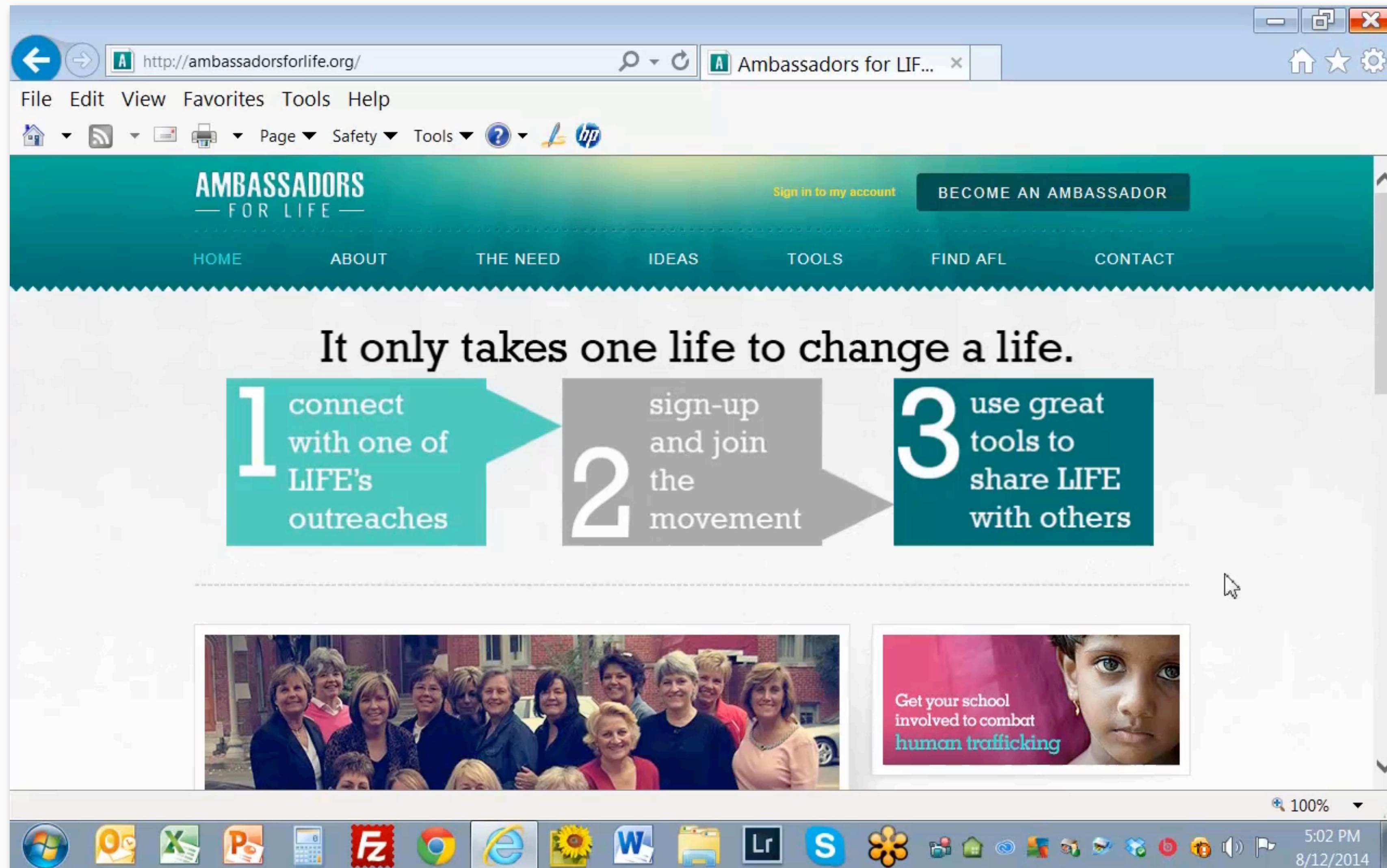
Sketches

Think aloud

Think aloud

In a thinking aloud test, you ask test participants to use the system while continuously thinking out loud — that is, simply verbalizing their thoughts as they move through the user interface.

Think aloud demonstration



<https://www.nngroup.com/articles/thinking-aloud-demo-video/>

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PROS?

CONS?

Think aloud

In a thinking aloud test, you ask test participants to use the system while continuously thinking out loud — that is, simply verbalizing their thoughts as they move through the user interface.

PROS: *Cheap, robust, flexible, convincing, and easy-to-learn*

CONS: *Unnatural situation, filtered statements, biasing user behavior*

Scripts

Now as you work on the tasks, I am going to have you do what we call "think out loud." What that means is that I want you to say out loud what you are thinking as you work. Let me show you what I mean. I am going to think out loud as I see whether I need to replace the staples in this stapler. Ok, I am picking it up. It looks like an ordinary stapler. I would expect that there would be some words or arrow that show me how it opens. I don't see any here. I am disappointed in that. Well I am going to pull it apart here. I think that this is how it opens. It seems easy to pull apart, that's good. I can see there are staples in it. So I am going to close it. That was pretty much how I expected the stapler to work. Do you see what I mean about thinking out loud? I am going to give you some practice by telling me out loud how you would replace the tape in this tape dispenser.

In this study, we are interested in what you say to yourself as you perform some tasks that we give you. In order to do this, we will ask you to think aloud as you work on the tasks. What I mean by think aloud is that I want you to say out loud everything that you say to yourself silently. Just act as if you are alone in the room speaking to yourself. If you are silent for any length of time, I will remind you to keep thinking aloud. Do you understand what I want you to do?