

Building User Interfaces

Experience Prototyping

Professor Bilge Mutlu

What we will learn today?

- VUI Design Context
- Experience Prototyping
- In-Class Activity

VUI Design Context

Recap: Module 3 Goals

Primary focus: Voice interfaces

Secondary foci: Building agents and characters, dialogue-based interaction,
connecting services, holistic user experience

Recap: What will we learn?

Design:

- VUI design principles and heuristics <
- Experience prototyping <
- Usability testing <
- Designing agents and personalities *bonus*

Build:

- DialogFlow <

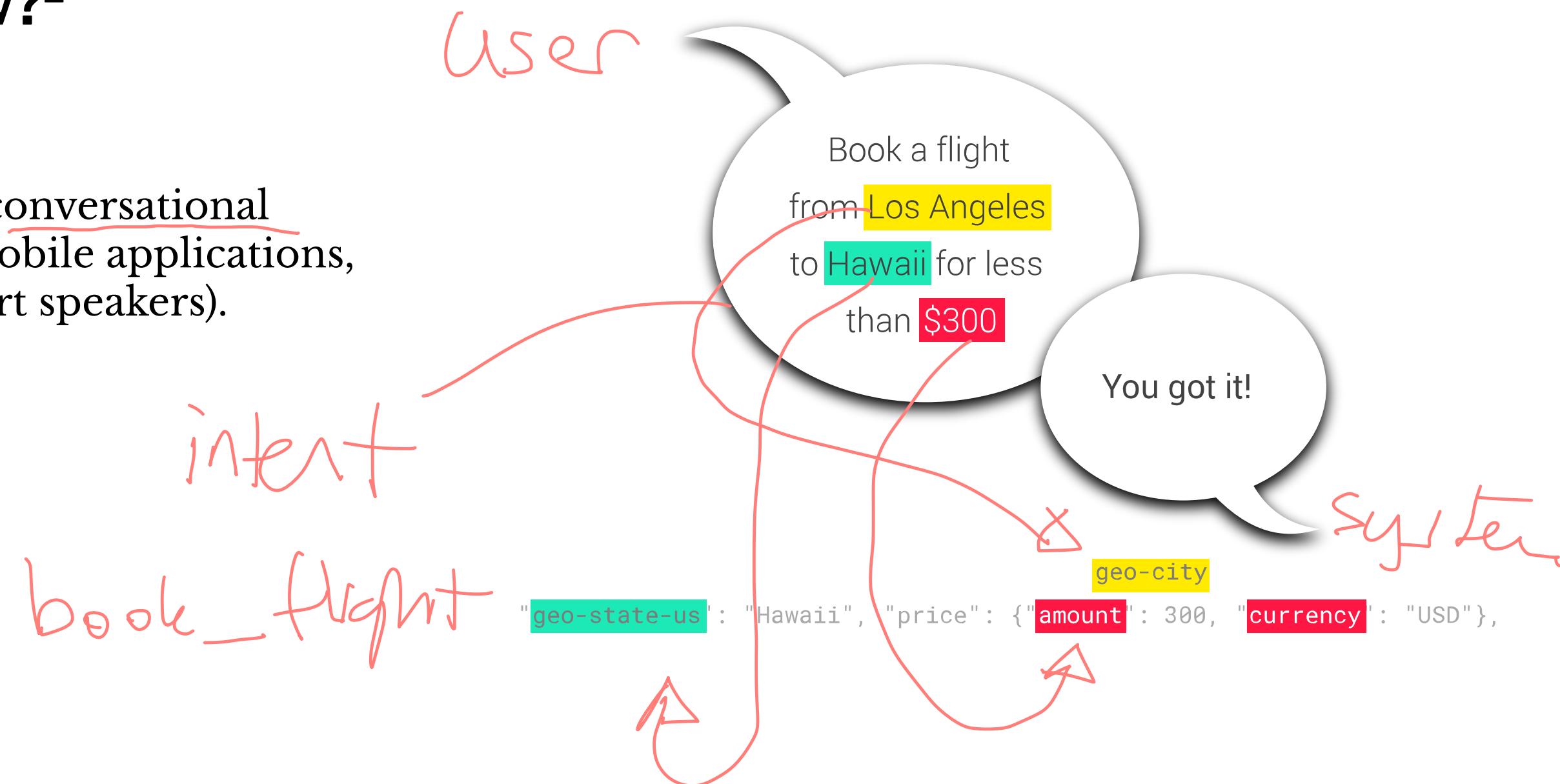
Intro to Dialogflow



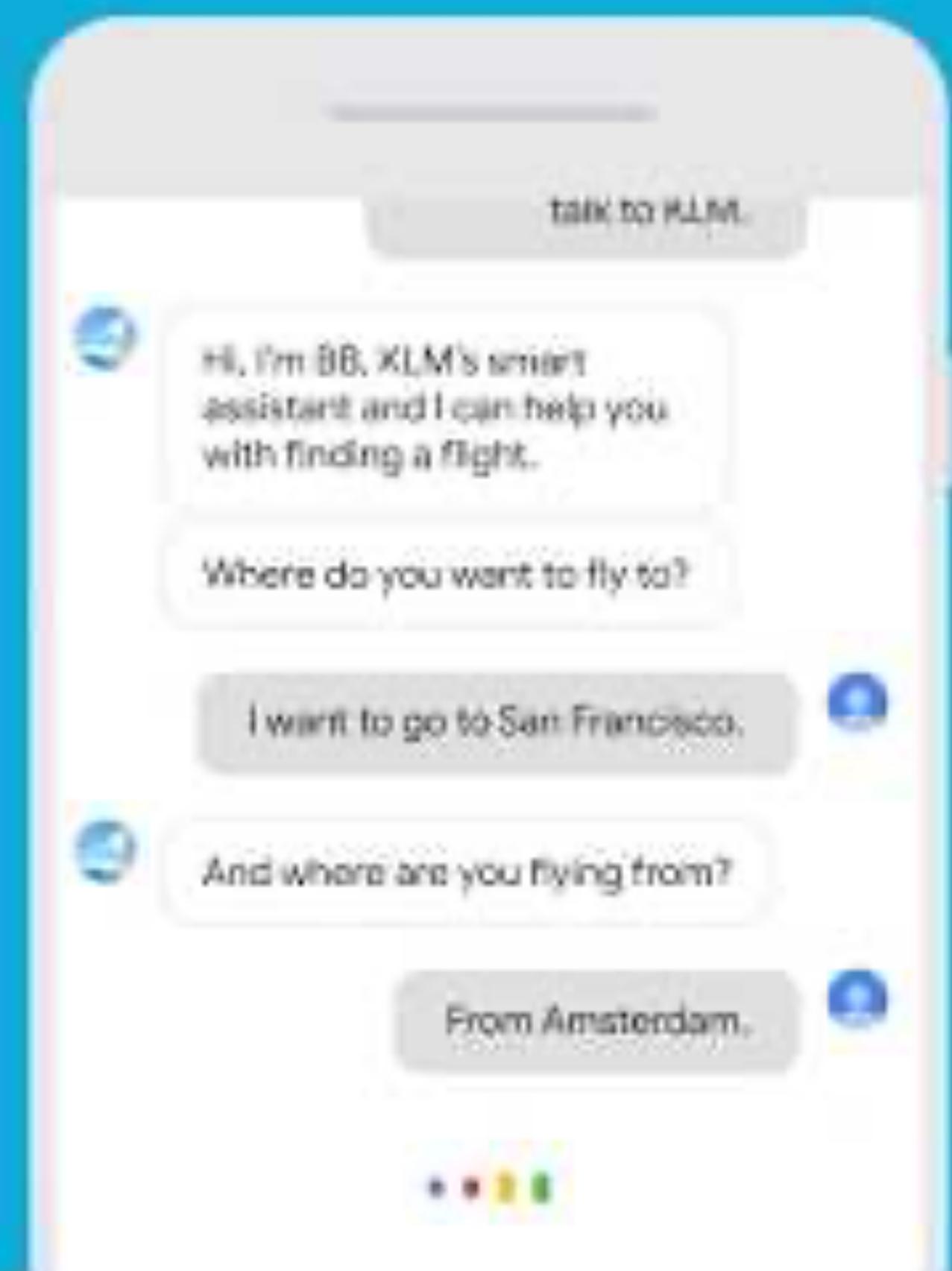
[^Video source](#)

What is DialogFlow?²

A development suite for conversational interfaces for websites, mobile applications, and IoT devices (e.g., smart speakers).



²Image source

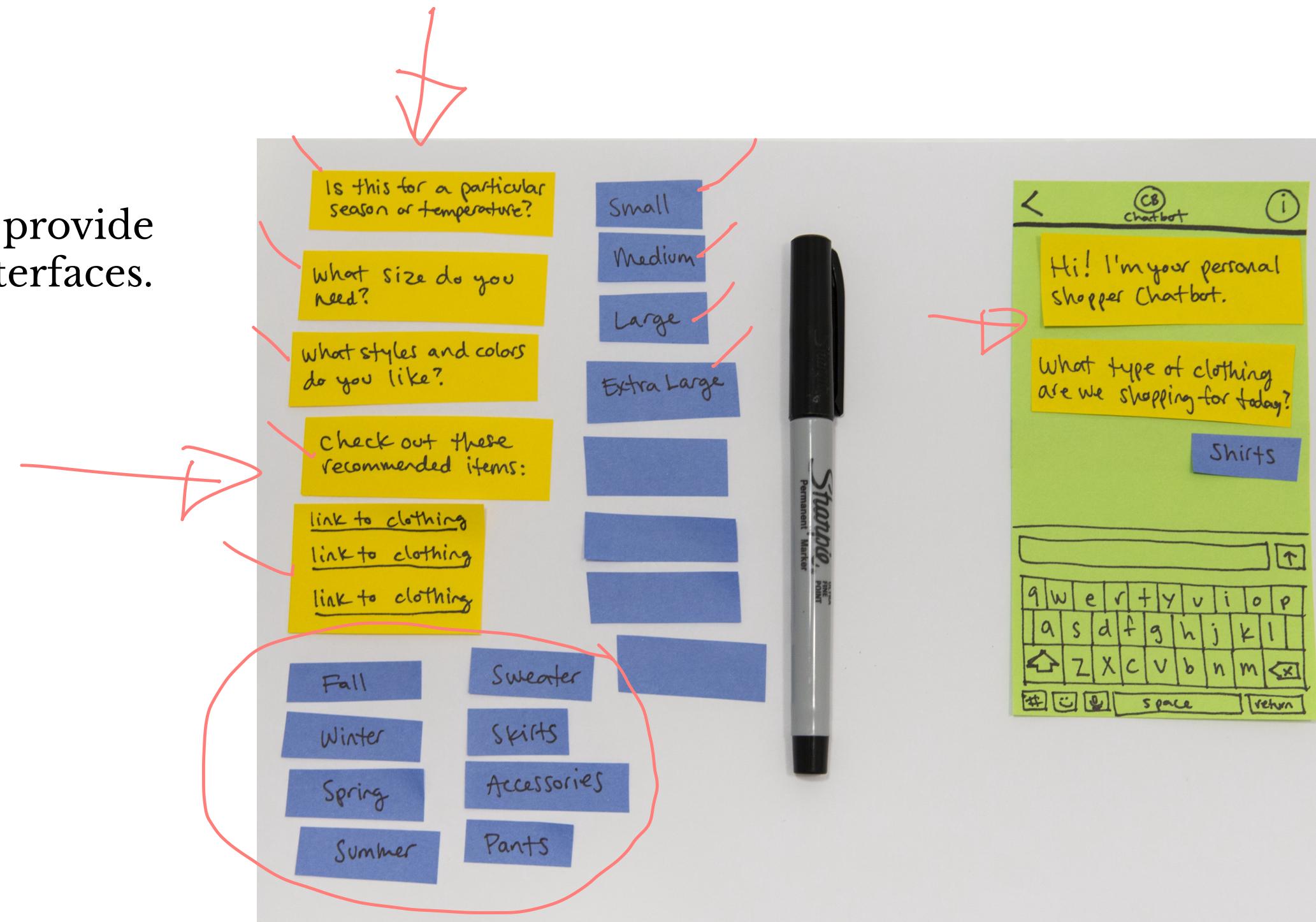
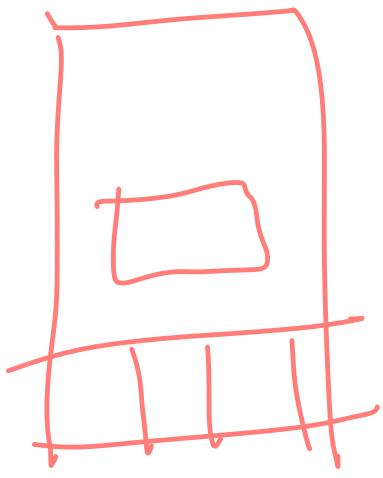


³Video source

Experience Prototyping

The Problem⁴

Conventional prototyping methods provide limited support for *conversational* interfaces.



⁴ Image Source

Conversational Interfaces

Definition: User interfaces that use **human dialogue** as the primary mode of human-computer interaction.

But why is it hard to prototype human dialogue?

Human Dialogue

Social interactions are driven by *tacit knowledge*:⁵

- ...we can know more than we can tell...
- An evolutionarily encoded and culturally situated set of rules, patterns, and practices for effective interpersonal communication.

How do we design interfaces that follow these rules, patterns, and practices?

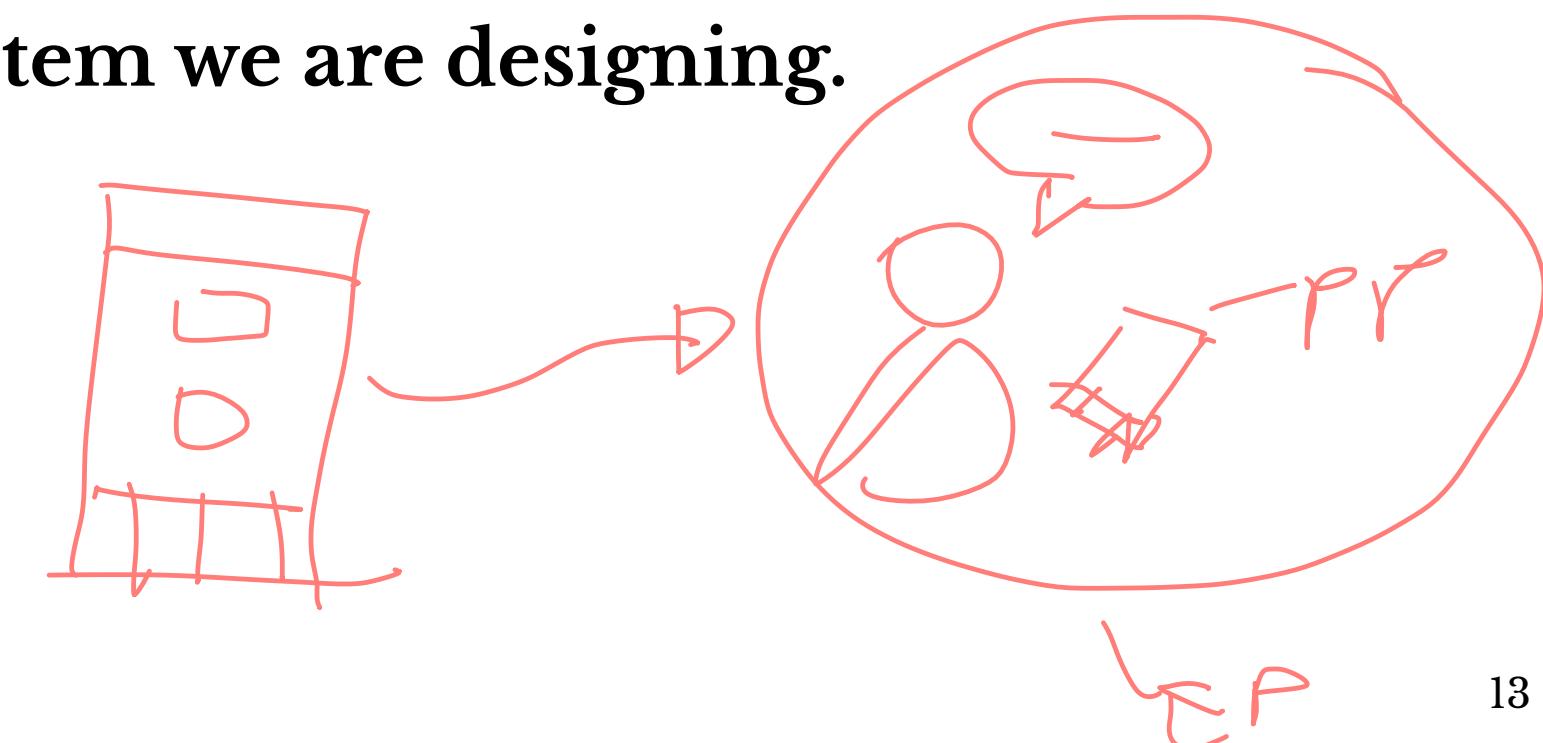
⁵ Michael Polanyi, 1958, *Personal Knowledge*

The Solution: Experience Prototyping

Definition: Prototyping the holistic experience of interacting with a product.

A related definition:⁶

An experience prototype is any kind of representation, in any medium, that is designed to understand, explore or communicate what it might be like to engage with the product, space, or system we are designing.



⁶ Buchenau & Fulton Suri, 2000, *Experience Prototyping*

Wait, what?⁷

- ?
- How does experience prototyping solve the problem of designing interfaces to follow human norms of interaction?

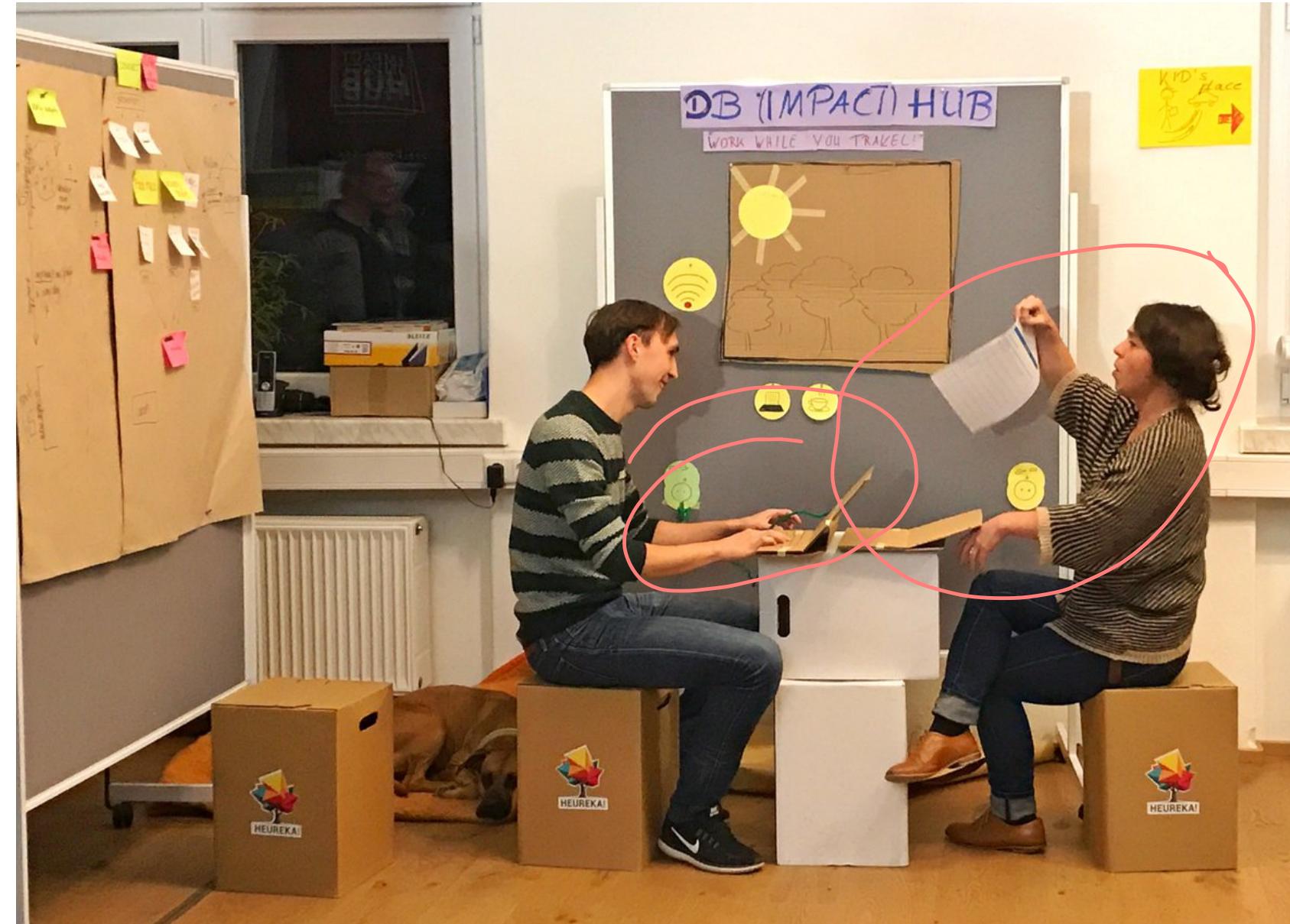
We have tacit knowledge about how conversational interactions work. By acting out an interaction, we apply our knowledge to a scenario.

➤ What I hear I forget. What I see, I remember. What I **do**, I understand!⁸

⁷ Chinese proverb

⁸ Image source

We use ourselves as decoders for the norms encoded in us!⁸

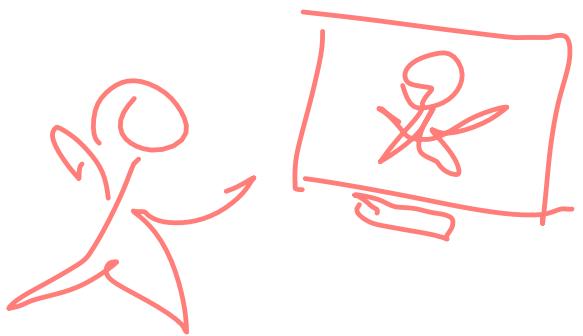
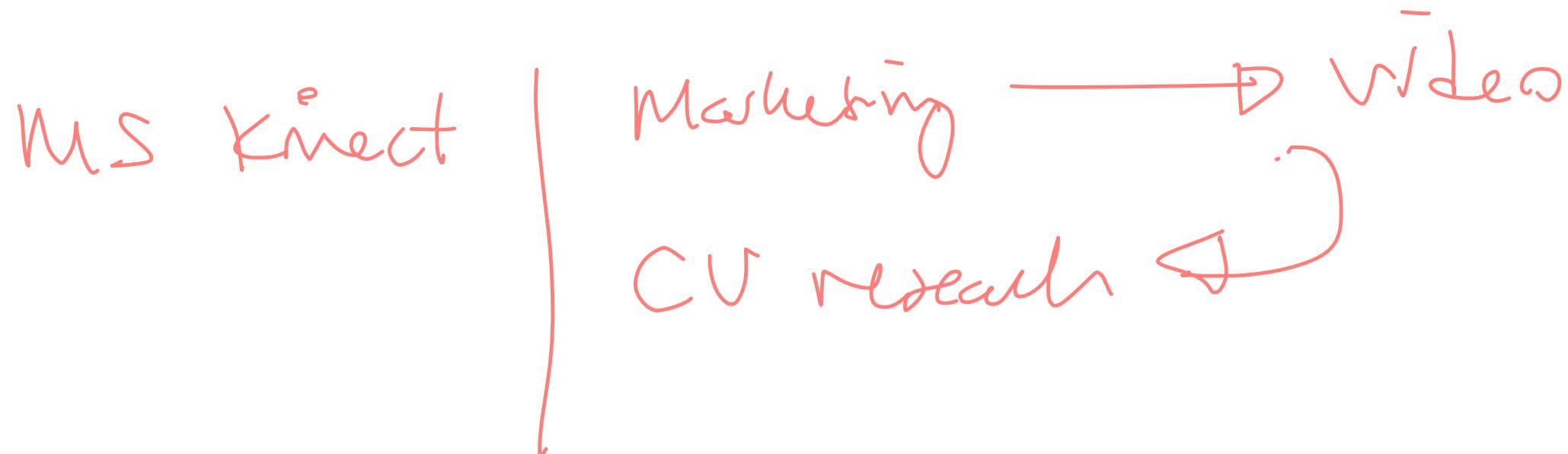


⁸ Image source

When do we do experience prototyping?

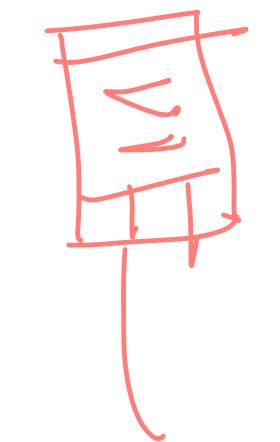
Three key uses:

1. Understanding existing user experiences and context
2. Exploring and evaluating design ideas
3. Communicating ideas to an audience

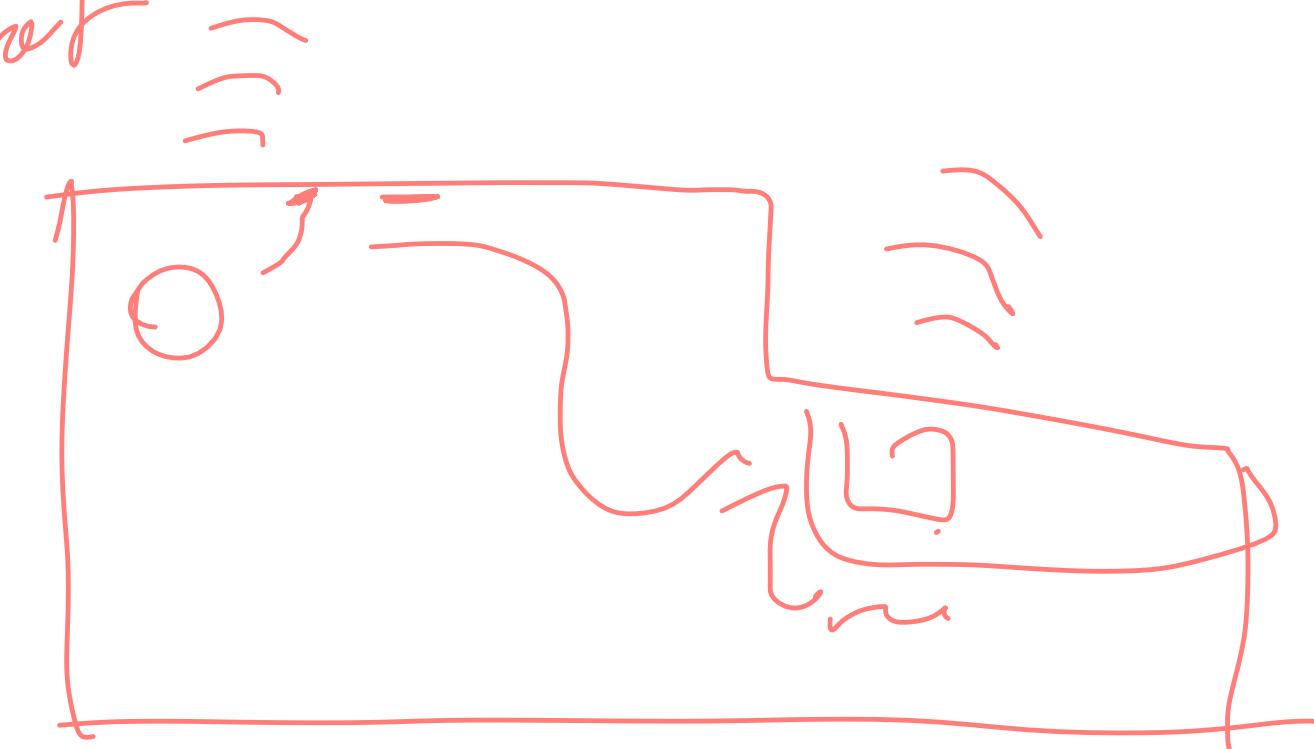
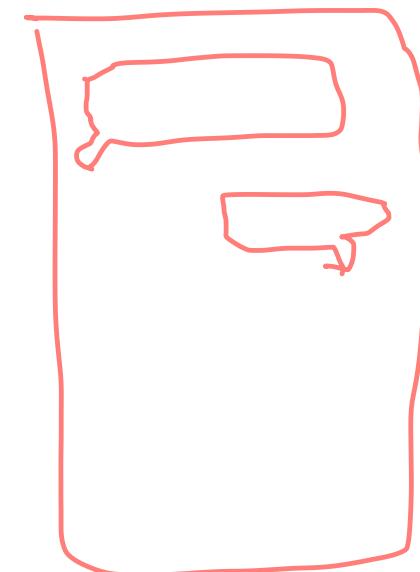
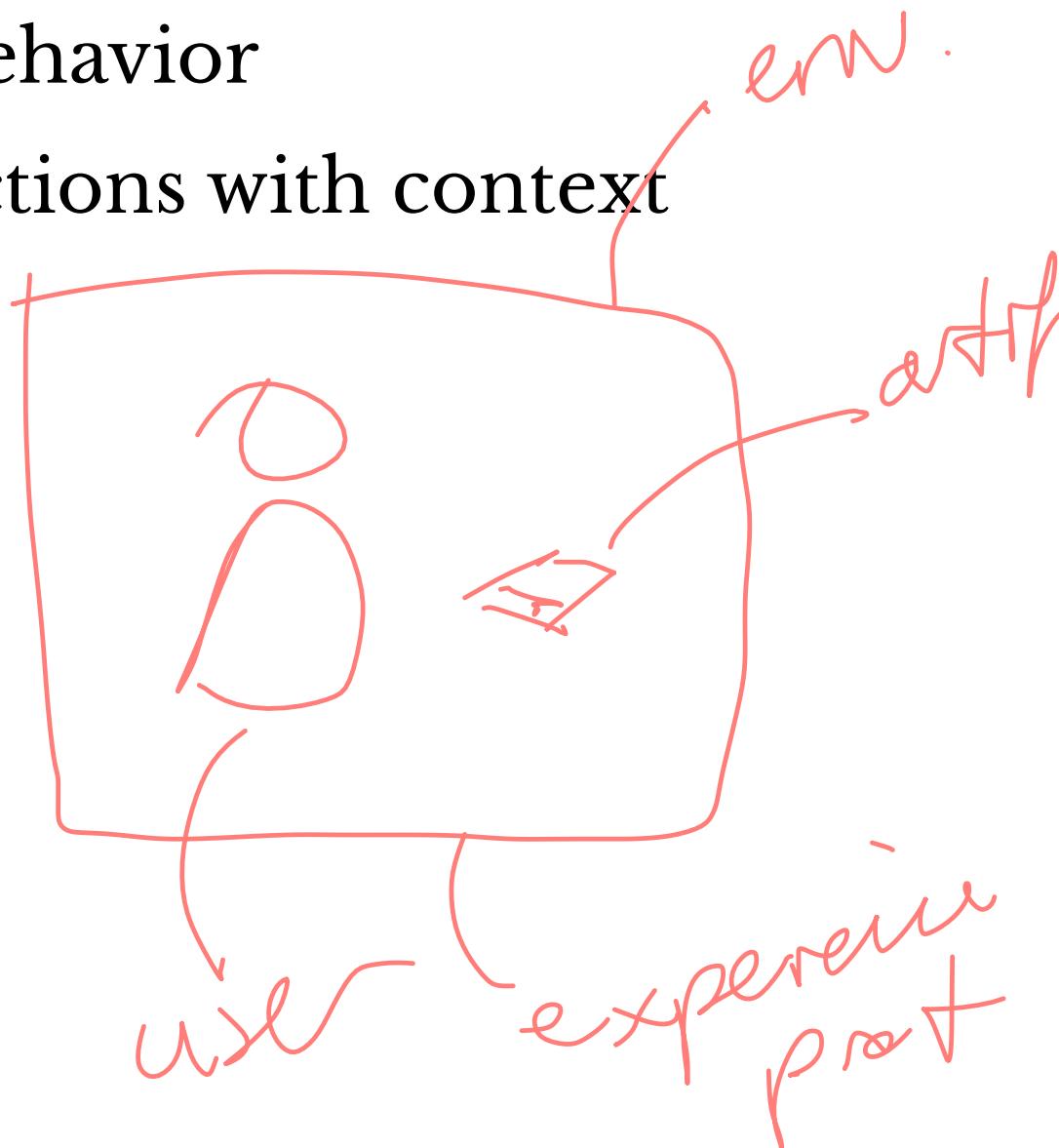


What is it that we prototype?

1. System behavior
2. User behavior
3. Interactions with context

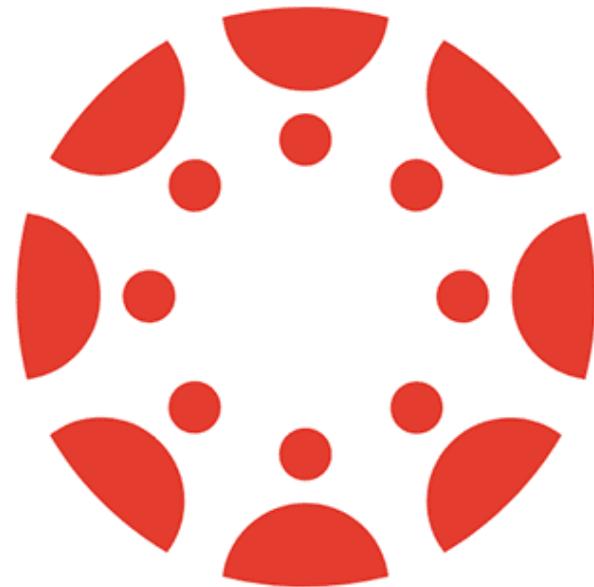


paper prot.



Quiz 1

Complete the Canvas quiz.



canvas

How do we do experience prototyping?

Step 1: Define context⁹

- > What is the context of the interaction?

E.g., passengers using entertainment system on a bus, travelers packing their luggage.

Module 3

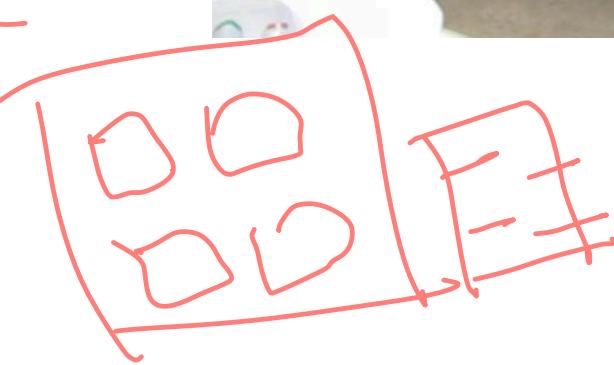
Don munday

KLM - B

Supporting customers of
an clothing retail store

online

⁹ Image source



Step 2: Develop Scenarios¹⁰

What are concrete interaction scenarios do we want to support?

E.g., buying a ticket, users packing, cooking a meal.

—
what the user is trying
to achieve?

(independent of
systems)

¹⁰ Image source



Step 3: Identify Design Goals¹¹

What role does my design play in these scenarios? How does it support the user in the target activity? What capabilities will it offer?

E.g., find, filter, and purchase flights; help the user set and follow personal goals through daily reminders.

What does the
system do?

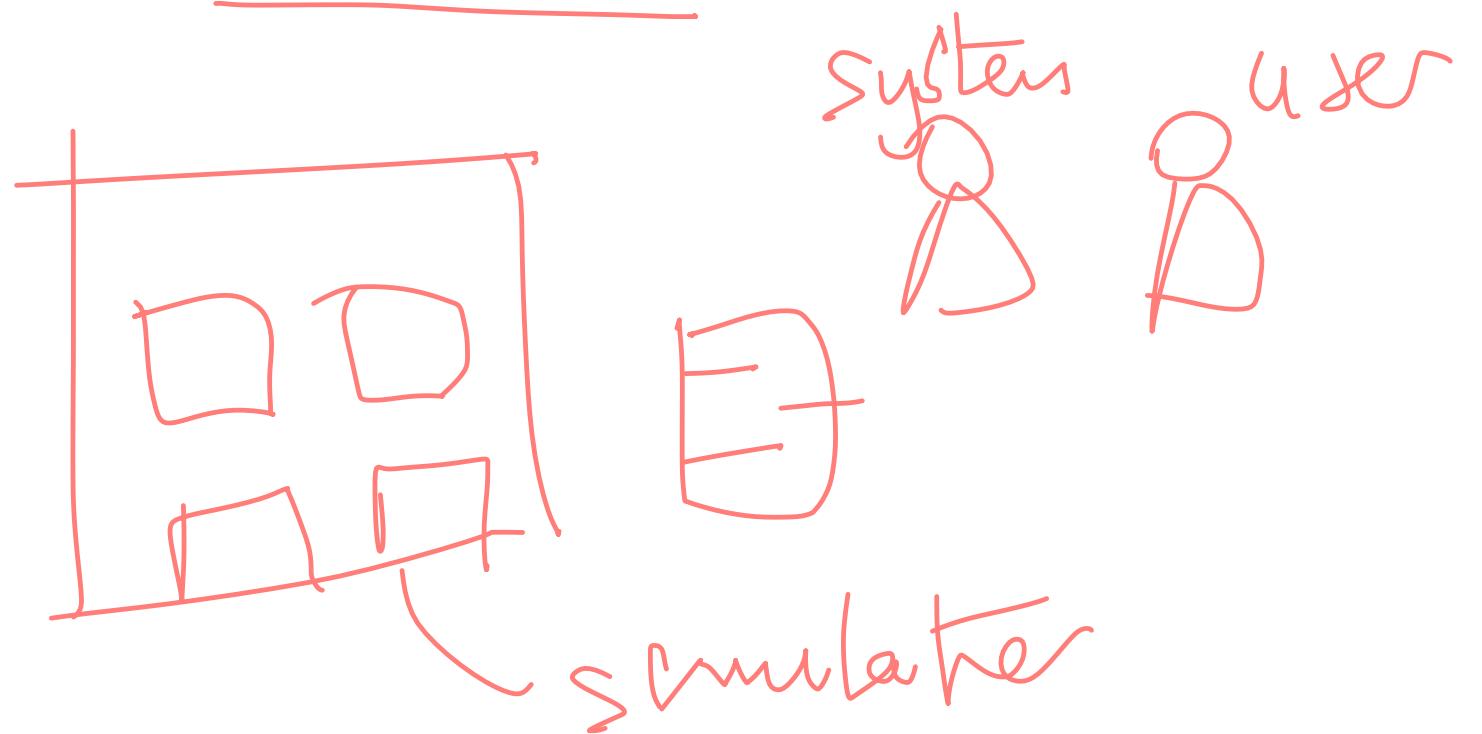


¹¹ [Image source](#)

Step 4: Set up the Environment¹²

How can I represent the context of the interaction?

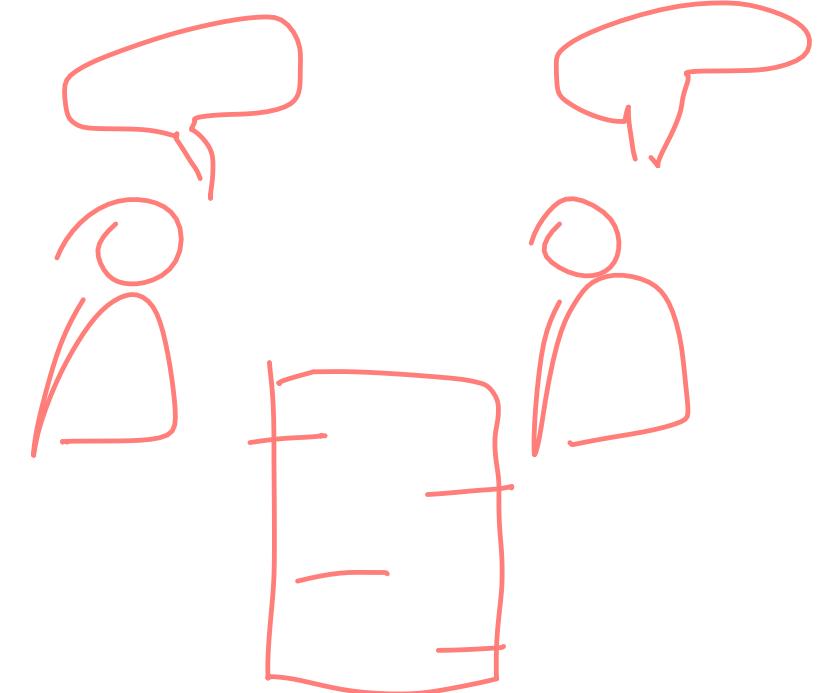
E.g., creating props to represent devices, environmental constraints.



¹² Image source

Step 5: Act out Interaction¹³

How will the interaction unfold? How will the user behave? How should the system behave?



¹³ [Image source](#)

Bodystorming¹⁴

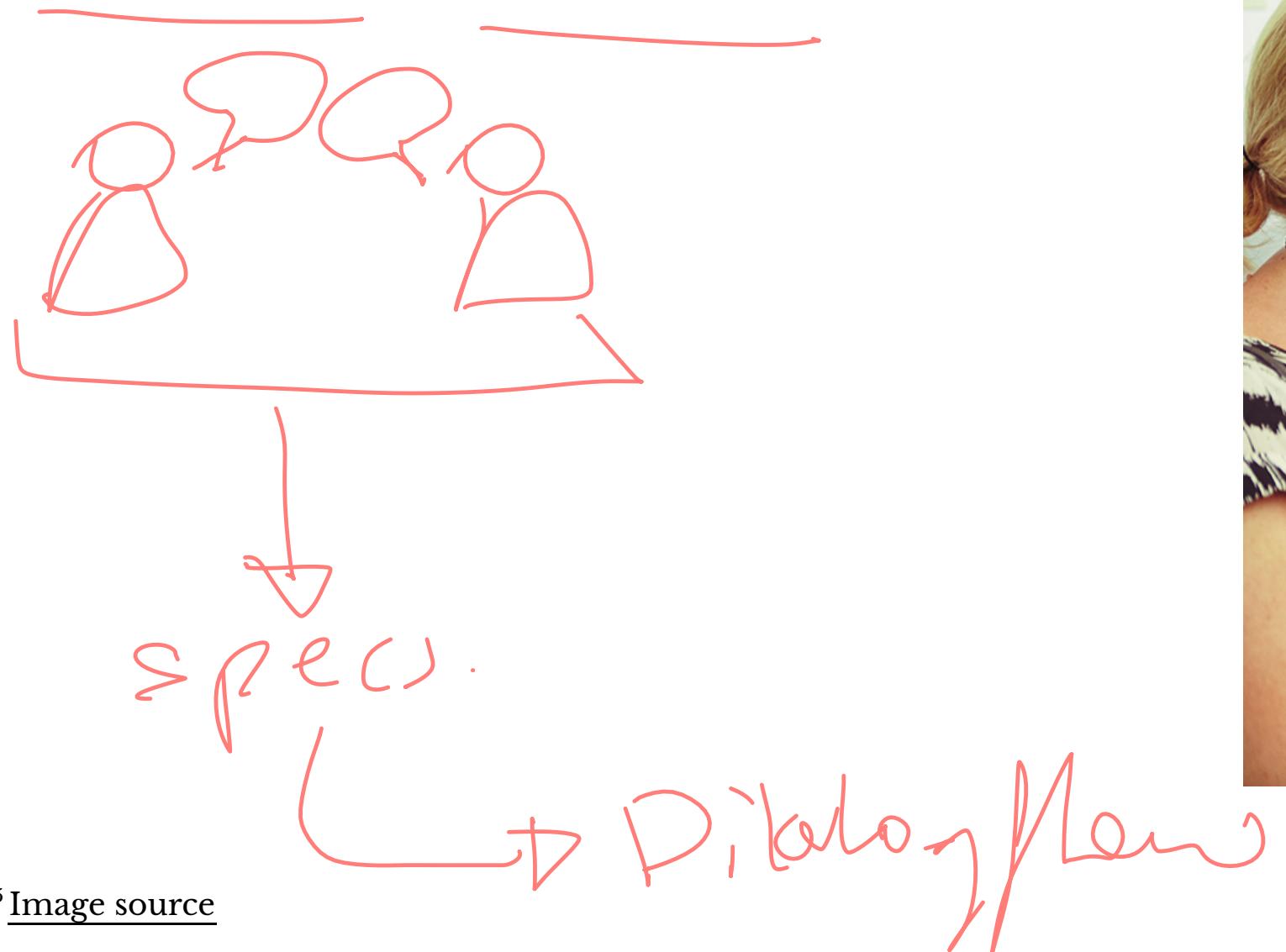
Definition: *Bodystorming* is a creativity method that involves physically experiencing a situation to develop new ideas and insights.



¹⁴ [Image source](#)

Step 6: Develop Insight¹⁵

What did you learn about system behavior,
user behavior, and interactions with context?



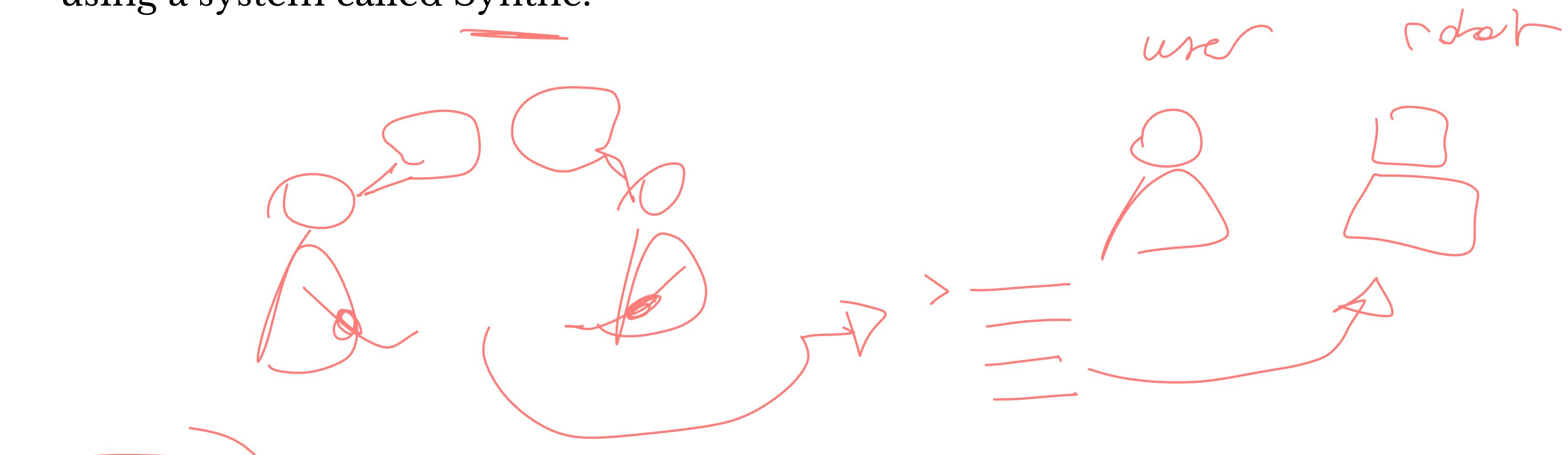
¹⁵ Image source



Pro Tip: Experience prototyping is *very* awkward. Get the awkwardness out of your system so that you can focus on using the method for design.

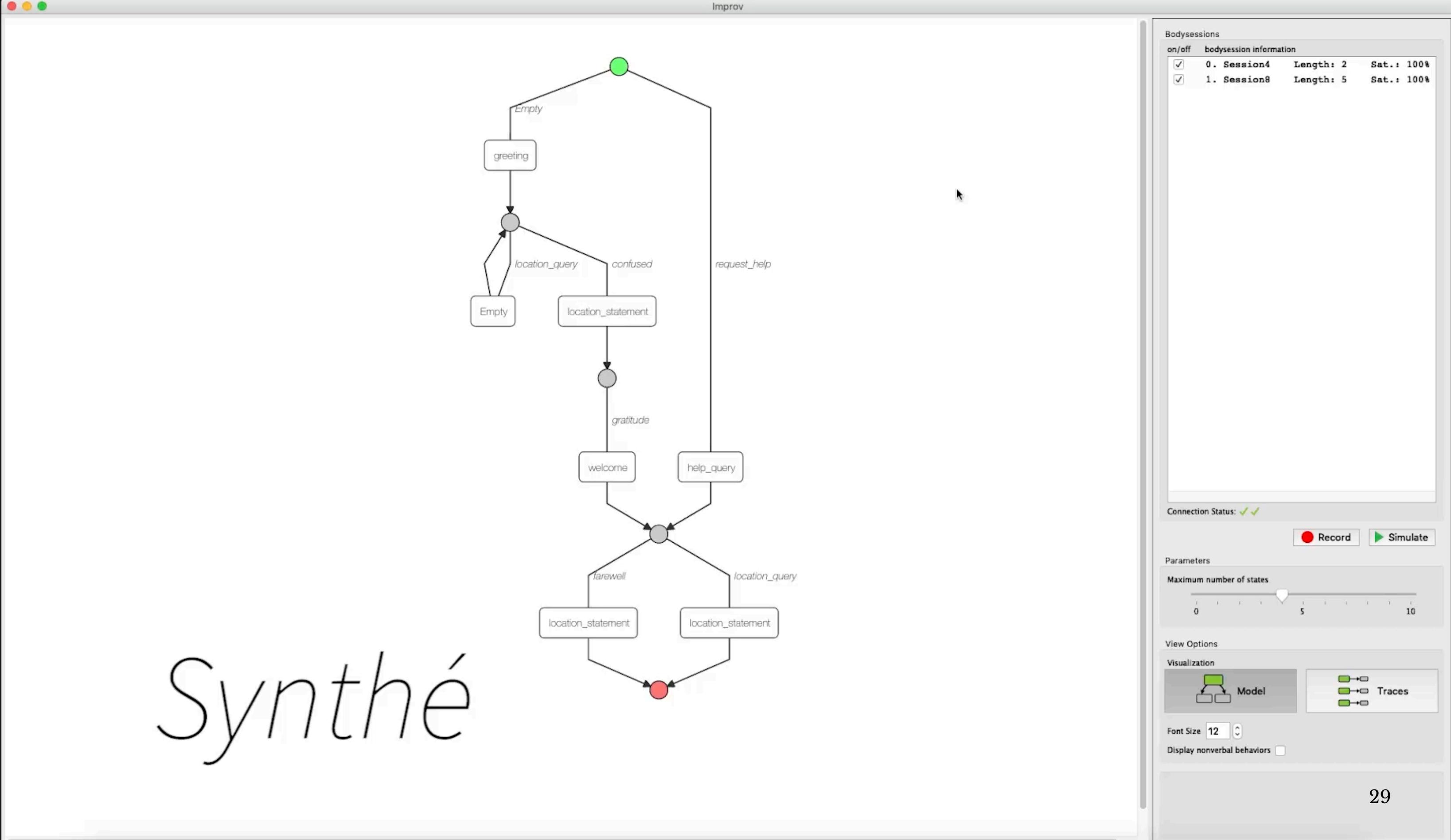
Example Use of Bodystorming¹⁶

Supporting design teams in ideating and acting out human-robot interactions using a system called Synthé.



¹⁶ Porfirio et al., 2019, *Bodystorming Human-Robot Interactions*

Synthé

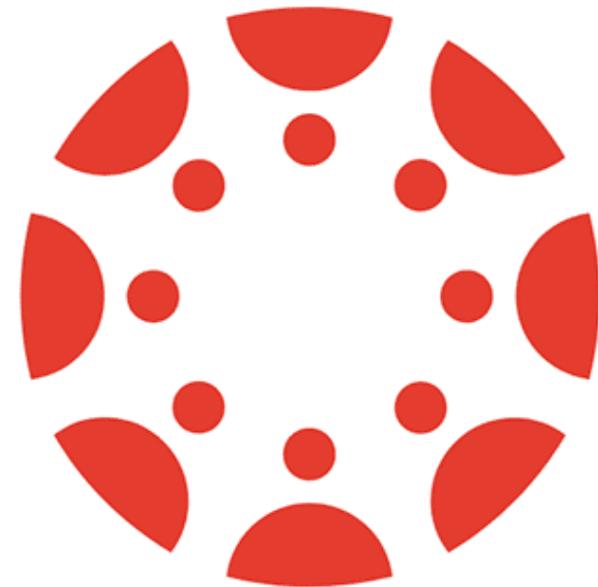


Additional resources

- Seminar paper on experience prototyping
- Case studies in bodystorming
- "Universal Methods of Design": sections on *experience prototyping* and *bodystorming*

Quiz 2

Complete the Canvas quiz.



canvas

In-class Activity

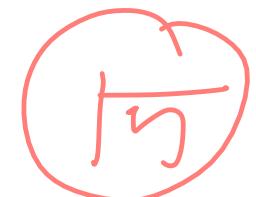
Module 3 Deliverable

We will design and build a voice-based interface for a retail website for clothes.

Experience Prototyping Activity

We will perform an initial experience prototype of a *shopping assistant*:

- Work in groups of 3
 - Person 1: Acts out system behavior
 - Person 2: Acts out user behavior
 - Person 3: Simulates systems, captures conversation
- Experience prototype a shopping assistant
- Report back to class



Steps

Experience prototype activity template

1. Define context (*user interaction with a clothing retail website, e.g., Everlane*)
2. Develop scenarios (*e.g., find products, read reviews*) — 3 min
3. Identify design goals (*how should the user be supported?*) — 2 min
4. Set up environment (*very minimal in this design problem*) — ~1 min
5. **Verbally act out interaction** (*assign roles, bodystorm*) — ~8 min
6. Develop insight (*take notes on what you learned*) — 2 min

Quiz 3

Complete the Canvas quiz.



canvas

What did we learn today?

- VUI Design Context
- Experience Prototyping
- In-Class Activity

