

# 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:

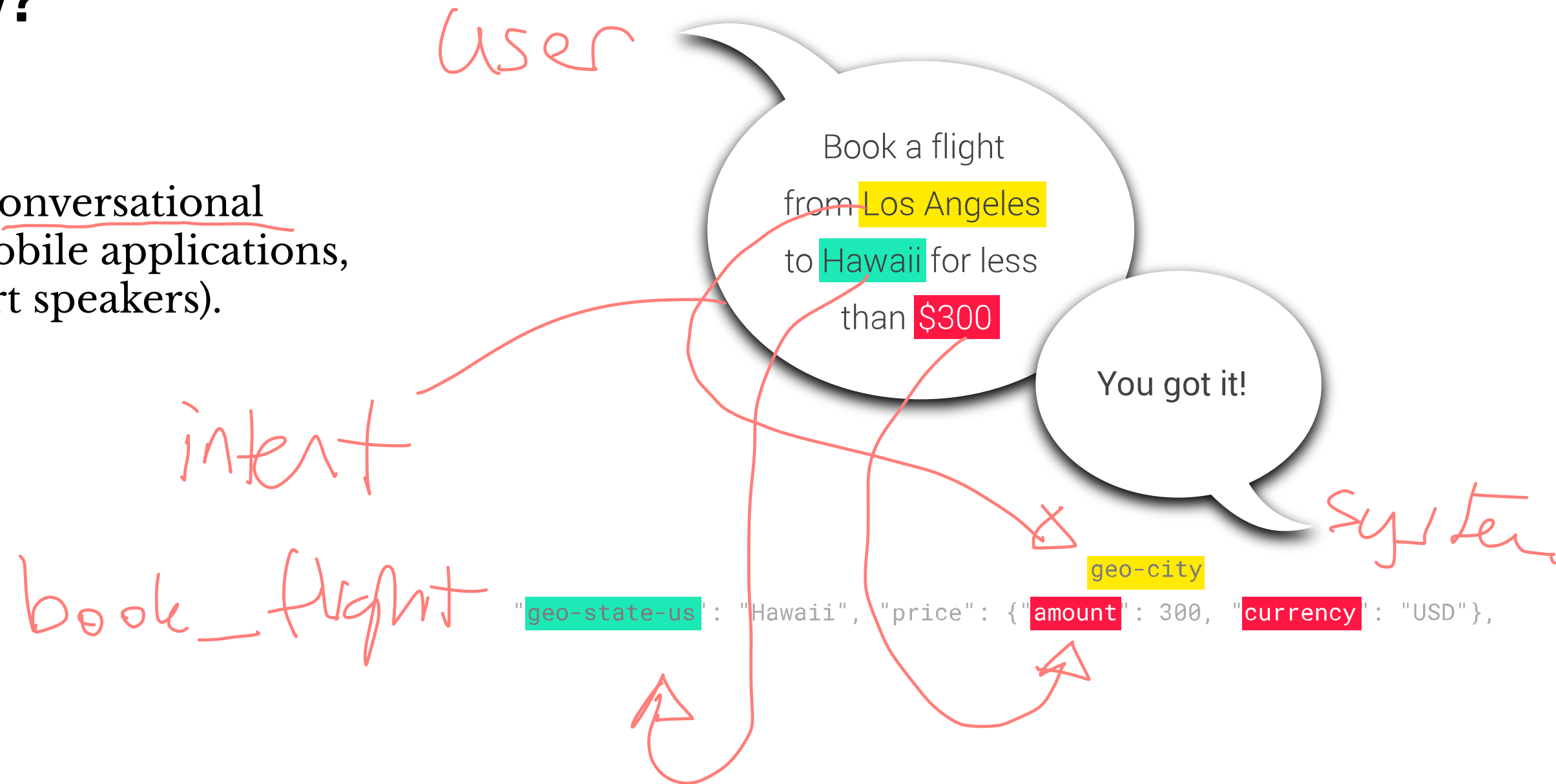
- DialogFlow <

# Intro to Dialogflow

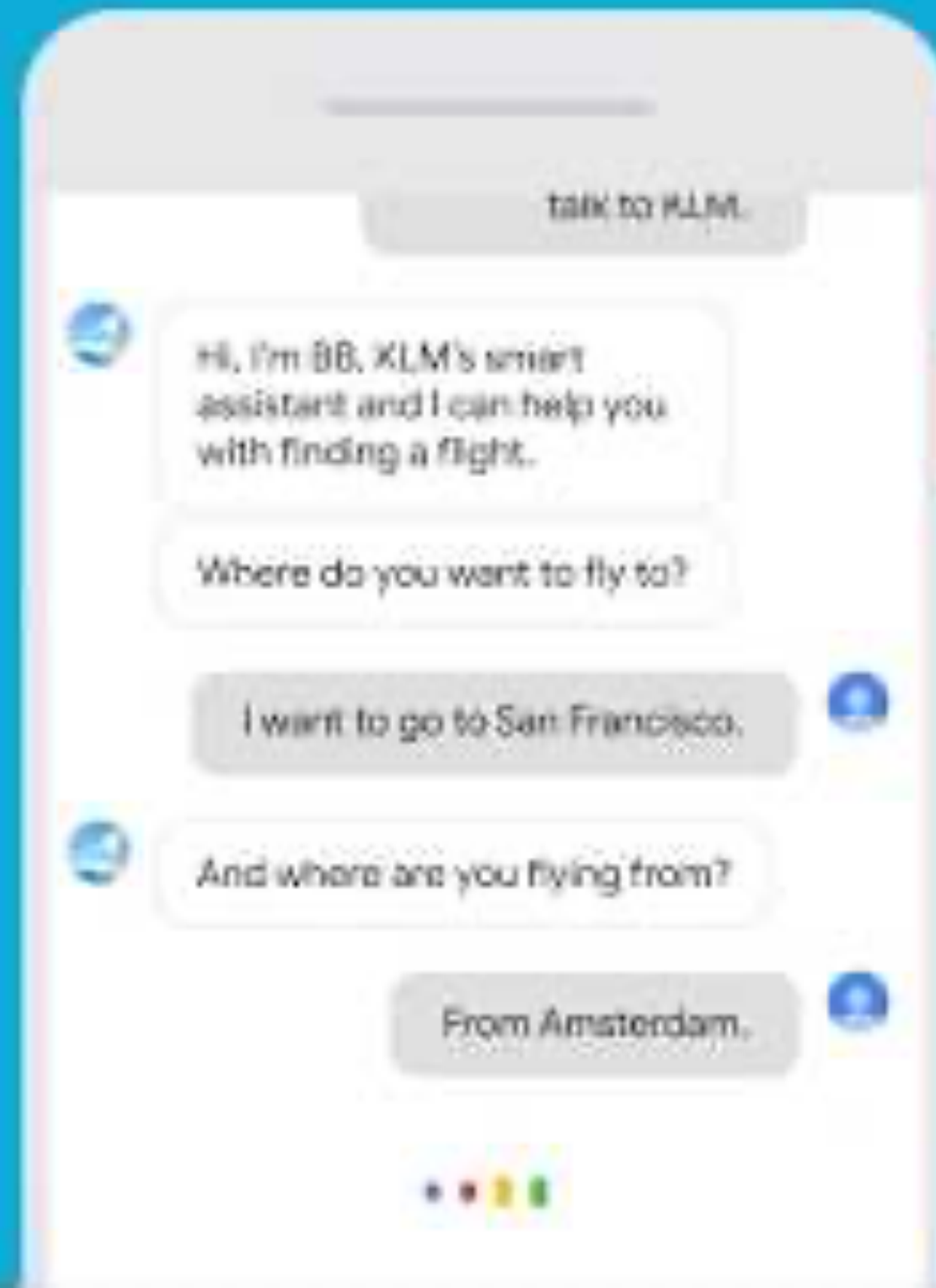
<sup>1</sup>Video source

# What is DialogFlow?<sup>2</sup>

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



<sup>2</sup>Image source

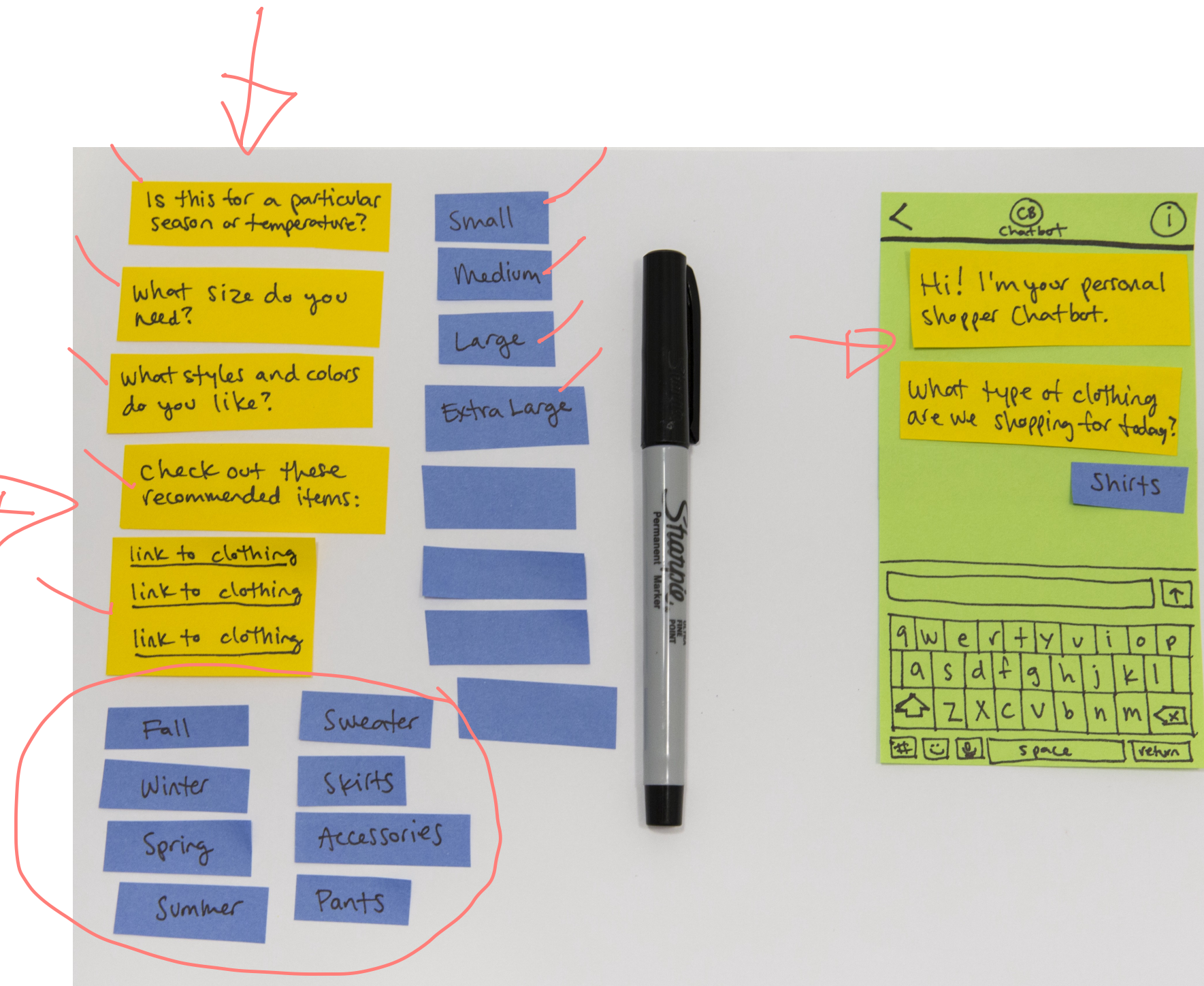


# Experience Prototyping



# The Problem<sup>4</sup>

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



<sup>4</sup> 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*:<sup>5</sup>

- > ...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?

<sup>5</sup> Michael Polanyi, 1958, *Personal Knowledge*

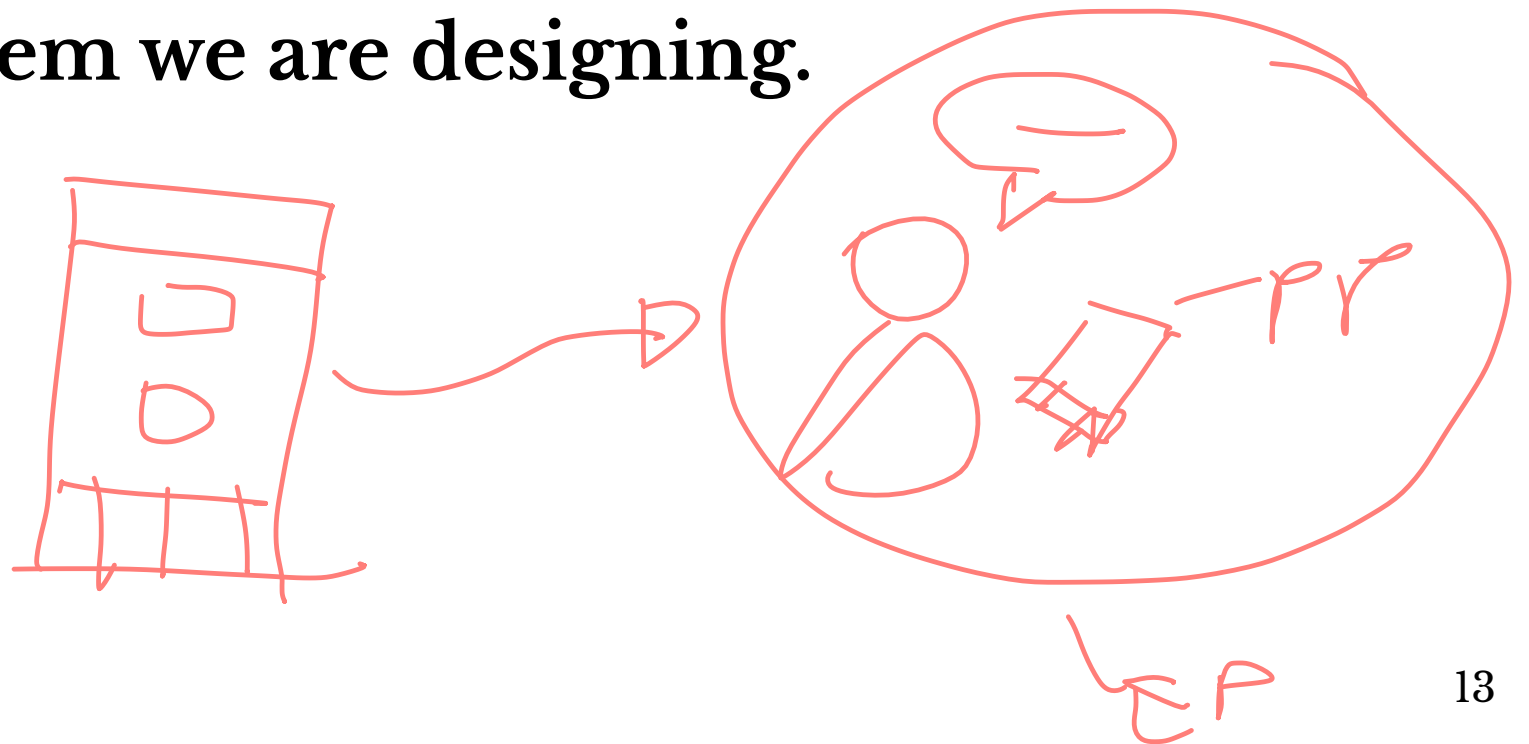


# The Solution: Experience Prototyping

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

A related definition:<sup>6</sup>

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.



<sup>6</sup> Buchenau & Fulton Suri, 2000, *Experience Prototyping*

# Wait, what?<sup>7</sup>

- 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!<sup>8</sup>

<sup>7</sup> Chinese proverb

<sup>8</sup> Image source

**We use ourselves as *decoders* for the norms encoded in us!<sup>8</sup>**

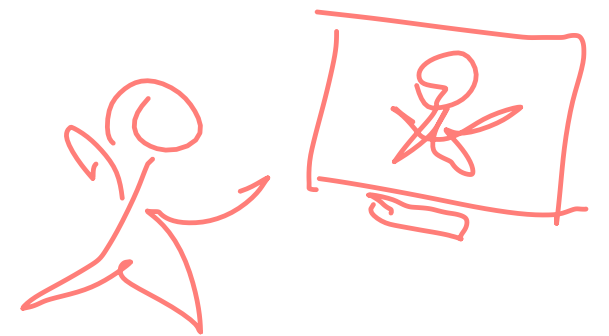
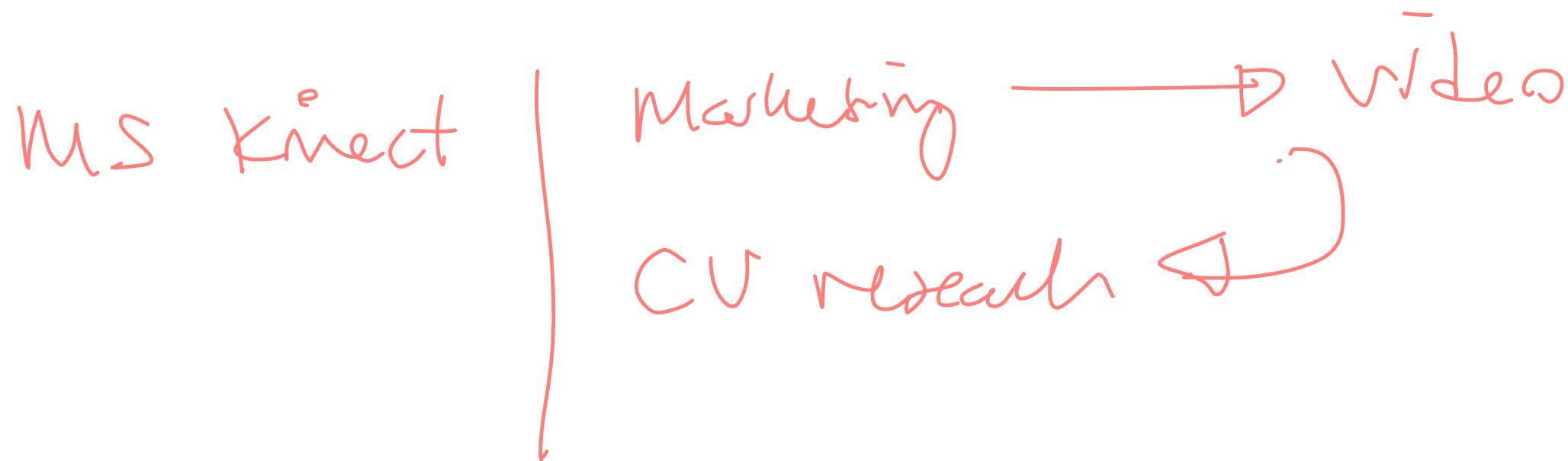


<sup>8</sup>Image source

# When do we do experience prototyping?

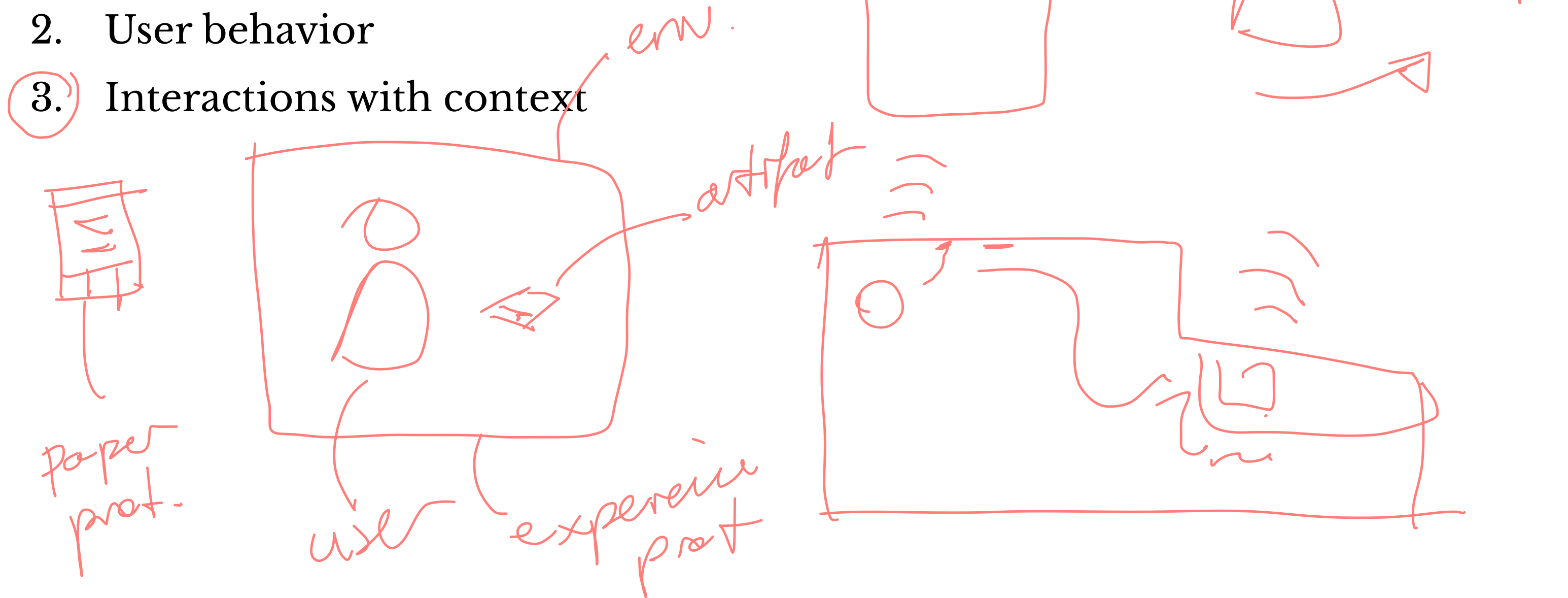
Three key uses:

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



# Quiz 1

Complete the Canvas quiz.



canvas

# How do we do experience prototyping?



# Step 1: Define context<sup>9</sup>

> What is the context of the interaction?

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



Module 3

ICLM-IB

Supporting customers of  
an clothing retail store  
online

<sup>9</sup>Image source





## Step 2: Develop Scenarios<sup>10</sup>

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 system)

<sup>10</sup> Image source





## Step 3: Identify Design Goals<sup>11</sup>

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 should the  
system do?

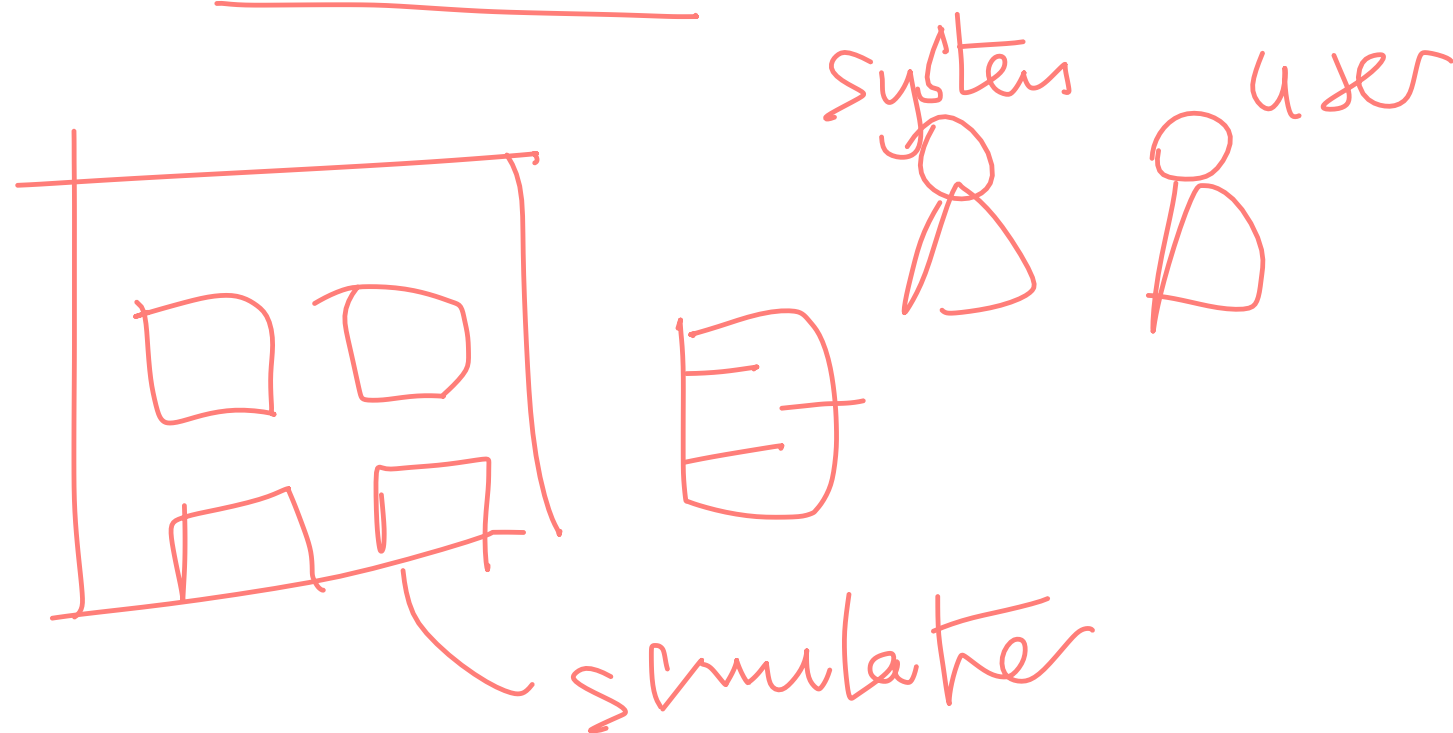
<sup>11</sup> Image source



## Step 4: Set up the Environment<sup>12</sup>

How can I represent the context of the interaction?

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

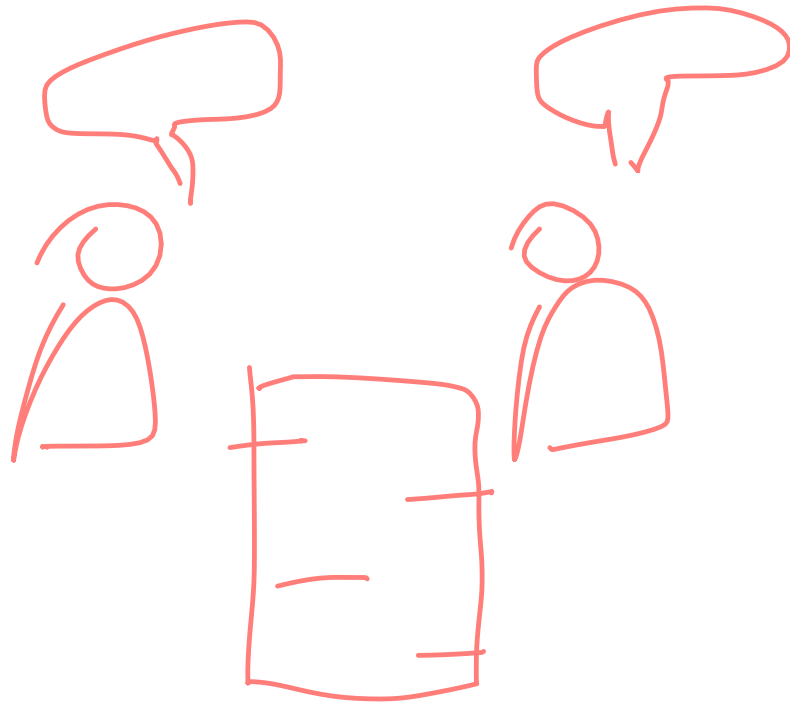


<sup>12</sup> Image source



## Step 5: Act out Interaction<sup>13</sup>

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



<sup>13</sup> Image source

# Bodystorming<sup>14</sup>

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

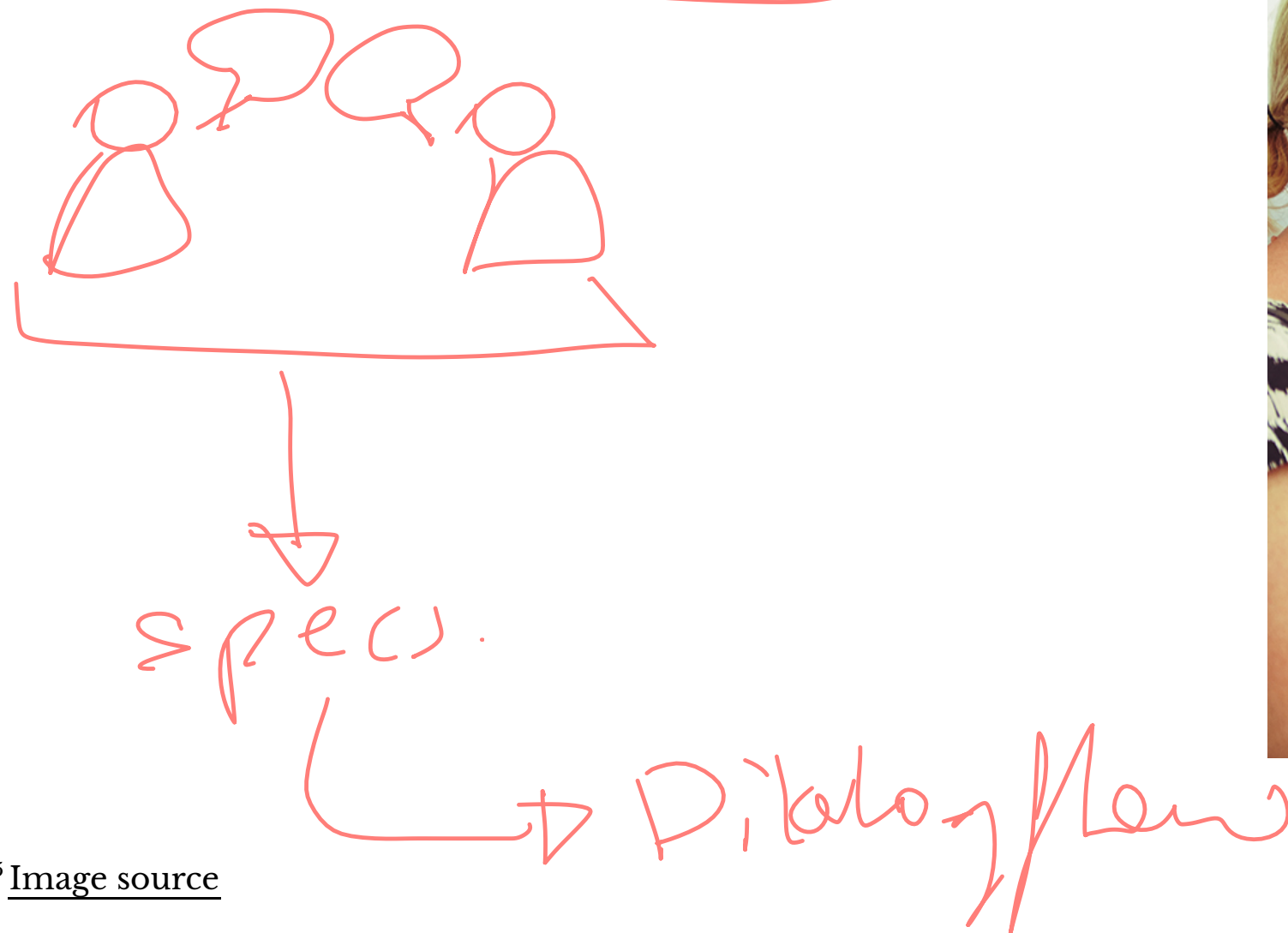


<sup>14</sup> Image source



## Step 6: Develop Insight<sup>15</sup>

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

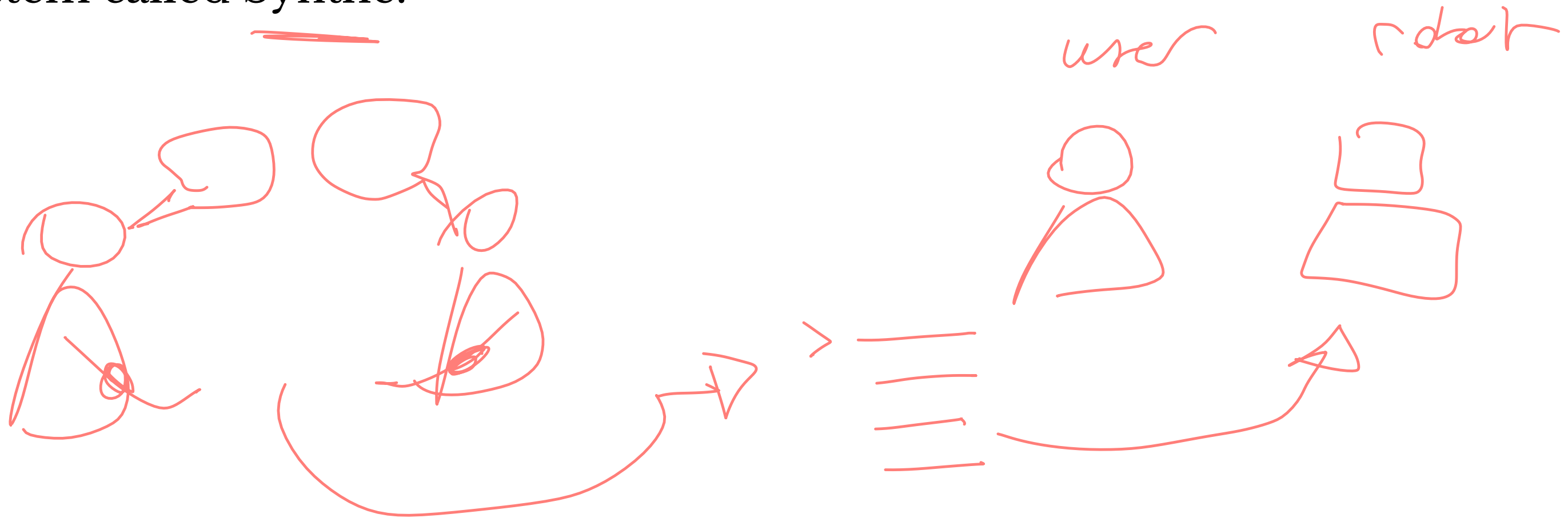


<sup>15</sup> Image source

*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 Bodystorming<sup>16</sup>

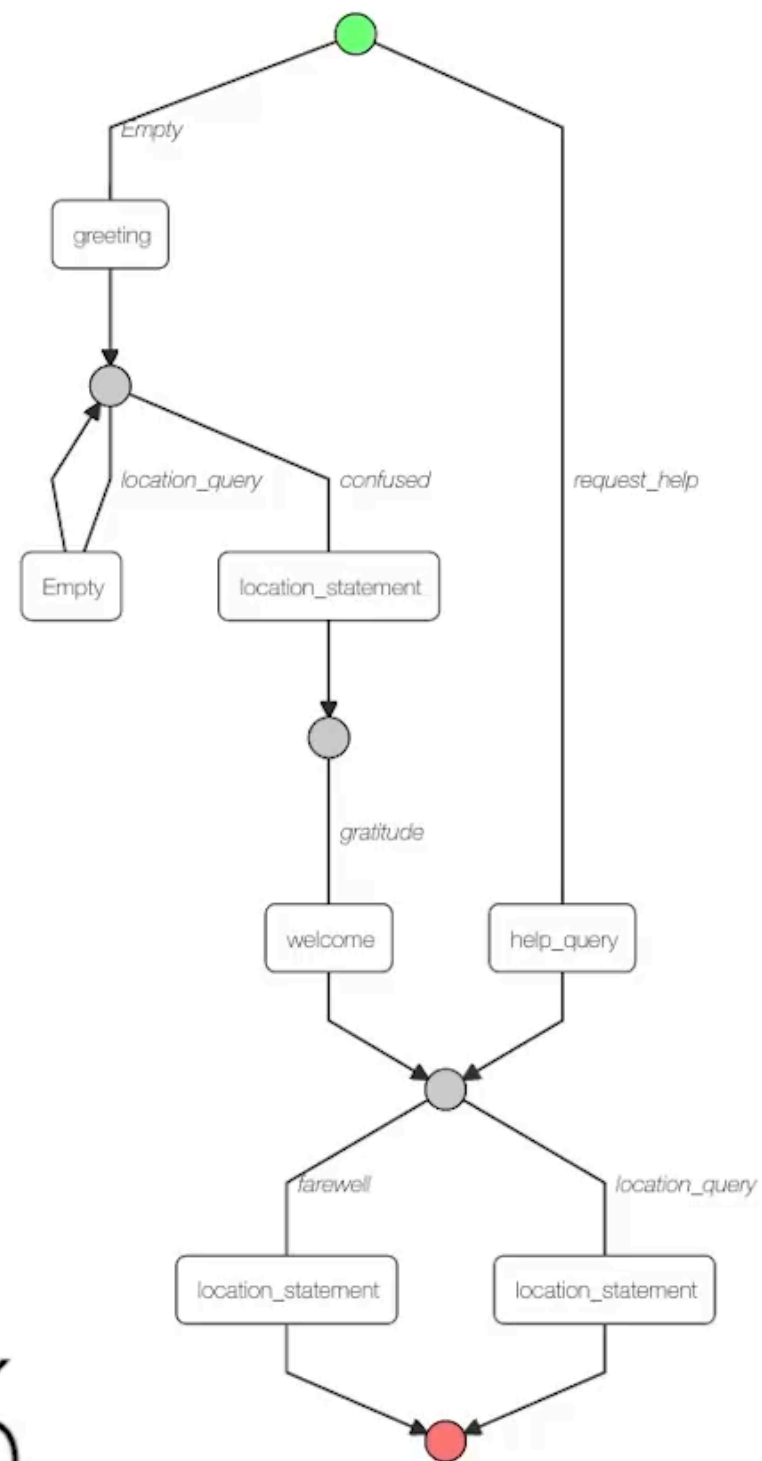
Supporting design teams in ideating and acting out human-robot interactions using a system called Synthé.



<sup>16</sup> Porfirio et al., 2019, *Bodystorming Human-Robot Interactions*



# Synthé



## Bodysessions

on/off	bodysession information		
<input checked="" type="checkbox"/>	0. Session4	Length: 2	Sat.: 100%
<input checked="" type="checkbox"/>	1. Session8	Length: 5	Sat.: 100%

Connection Status: ✓✓

☒ Record

☒ Simulate

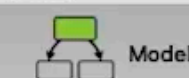
## Parameters

Maximum number of states

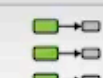


## View Options

### Visualization



Model



Traces

Font Size 12

Display nonverbal behaviors ☐

# 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

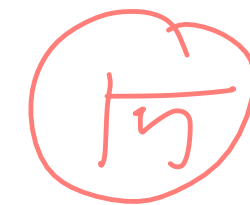
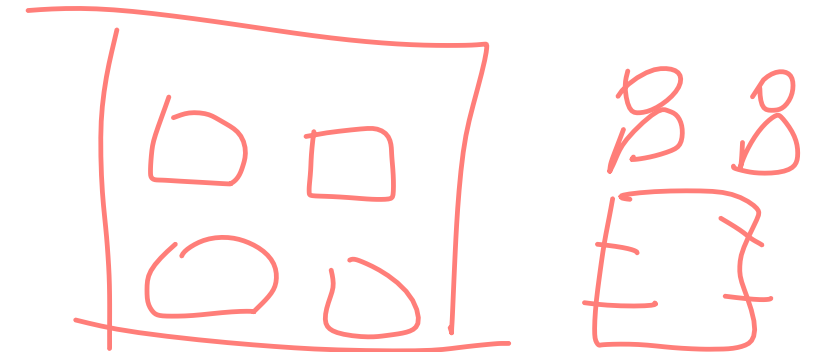
## Module 3 Deliverable

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

