Week 8: Mental Models

Wednesday lecture

Uta Hinrichs & Tara Capel

Slides inspired by previous HCI lecturers: Nicole Meng-Schneider, Kami Vaniea, John Vines

any questions about Assignment 2 (so far)?

today

- Re-cap: Mental models

mental models

quiz

1 Go to wooclap.com

2 Enter the event code in the top banner

Event code
SCASKF

Enable answers by SMS

There are three models of the system

- **User Model** - How the user thinks the product works. The mental model.
- **UI Model** - How the product is presented to the user in the user interface.
- **Implementation Model** - How the product is actually implemented.

“A mental model is what the user believes about the system at hand.”

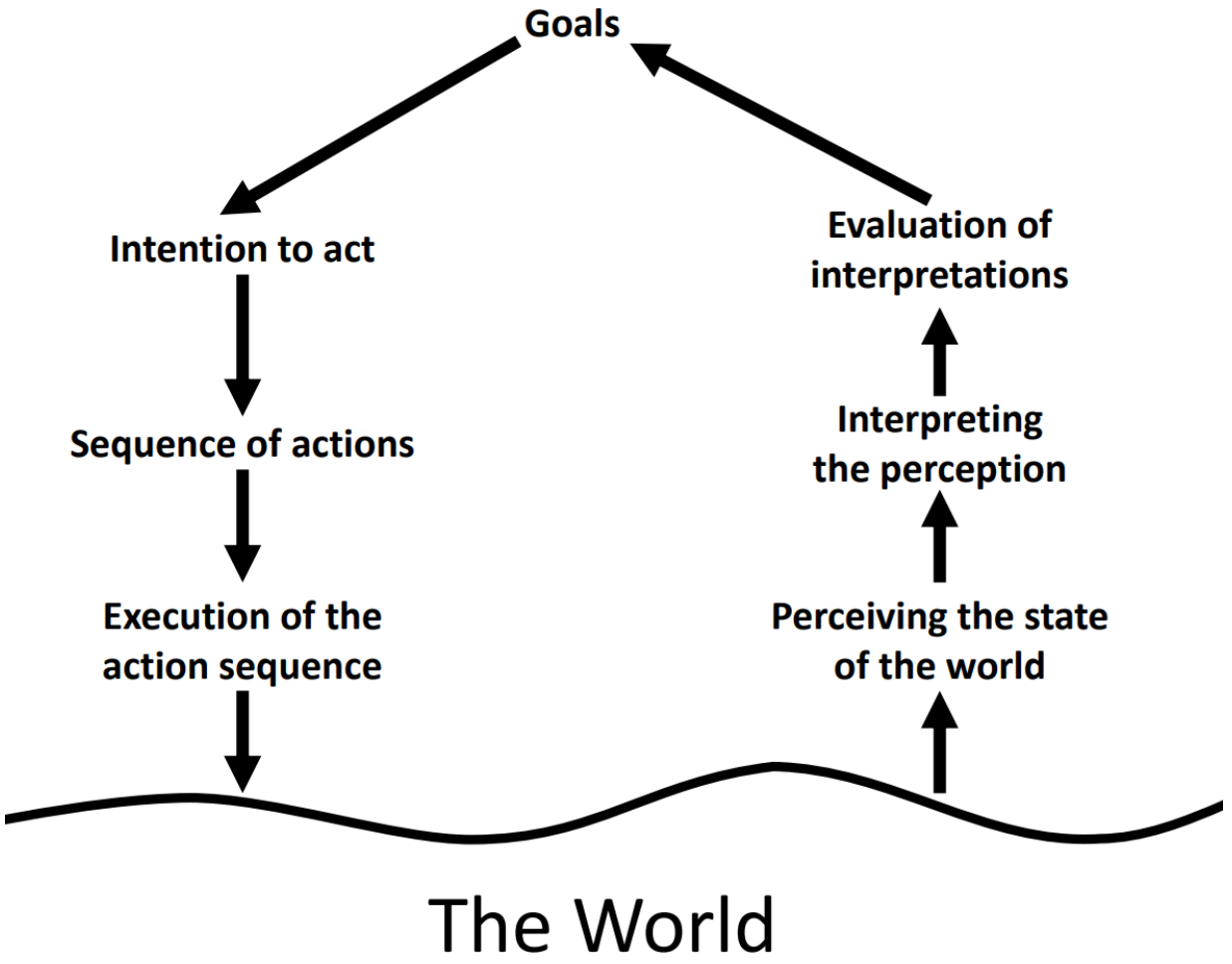
– Jacob Nielson

Mental Models (User Models)

- Representation of systems and environments
- Based on experiences
- People understand and interact with systems by comparing the outcomes of their mental models with the real-world systems
  - When outcomes match, the model is seen as accurate
  - When outcomes do not match, the model is adjusted
- Two types of mental models
  - System Models – Mental models of how systems work
  - Interaction models – Models of how people interact with systems

Building a mental model

Constant Feedback Loop



Building a mental model

Typical process for children:

How hard should I hit the egg so it cracks, but doesn't make a mess?

Photo by Hannah Tasker on Unsplash

Building a mental model

Also for adults:

How long after the cars get red till the pedestrian crossing shows green?

Photo by Alex Padurariu on Unsplash

“A user interface is well designed when the program behaves just as the user thought it would.”

– Joel Spolsky

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Intuitive Interaction

example case study

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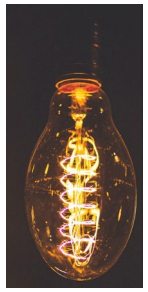
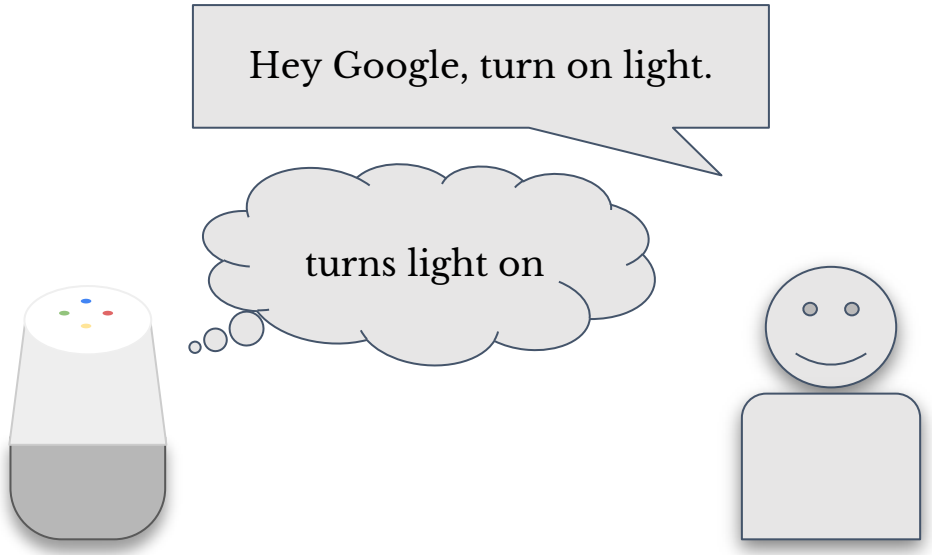
User Model – Smart Light





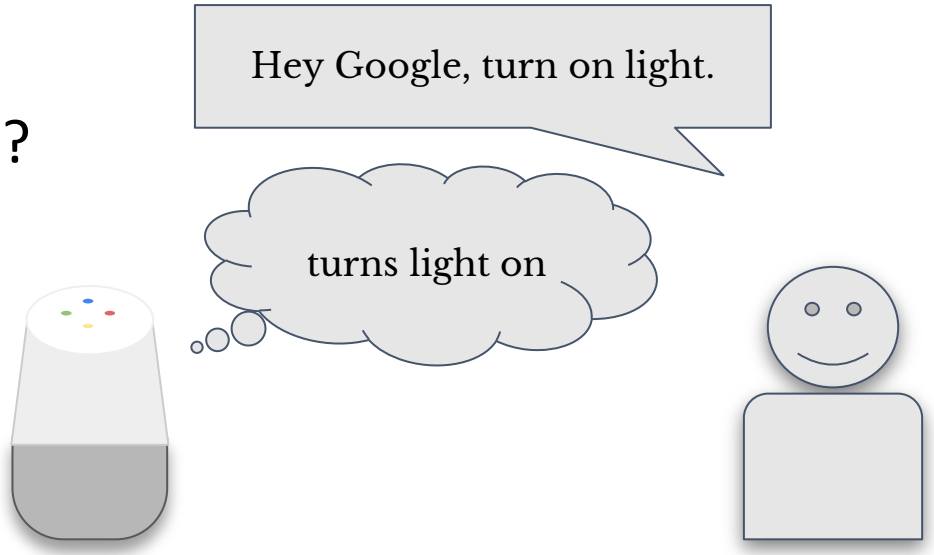
Interaction Model:

We say the words, it contacts the light and light turns on

* Nicole Meng, Dilara Keküllüoğlu, and Kami Vaniea. 2021. Owning and Sharing: Privacy Perceptions of Smart Speaker Users. Proc. ACM Hum.-Comput. Interact. 5, CSCW1, Article 45 (April 2021), 29 pages. https://doi.org/10.1145/3449119

User Model – Smart Light

- Study:
  - What do you think actually happens when you use Alexa to turn on the light?
- Sketches & interview



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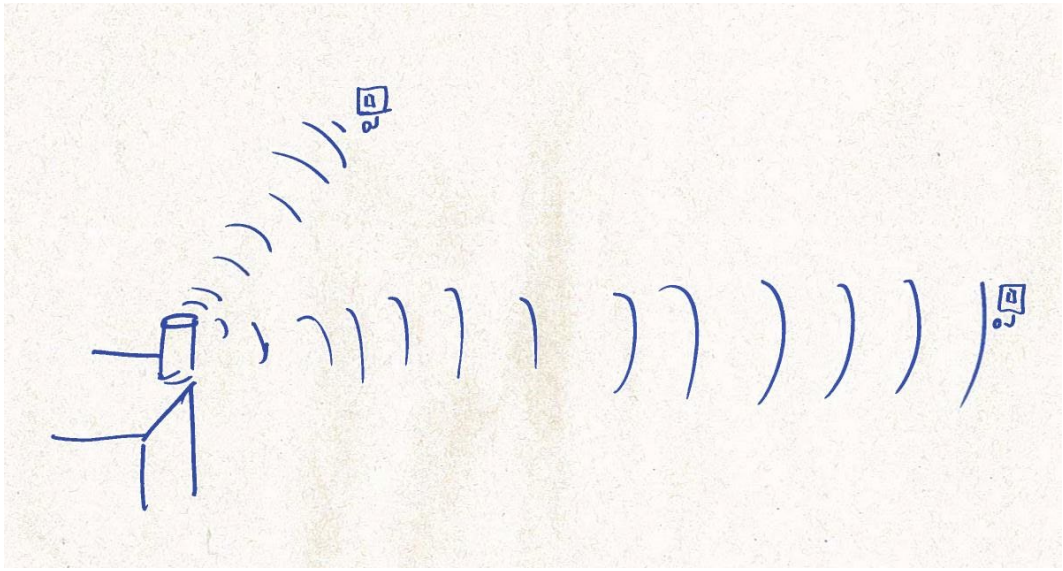

Image from Interview Study*, all rights reserved.

System Model:

Smart speaker communicated with light switches

→ Based on how it normally works

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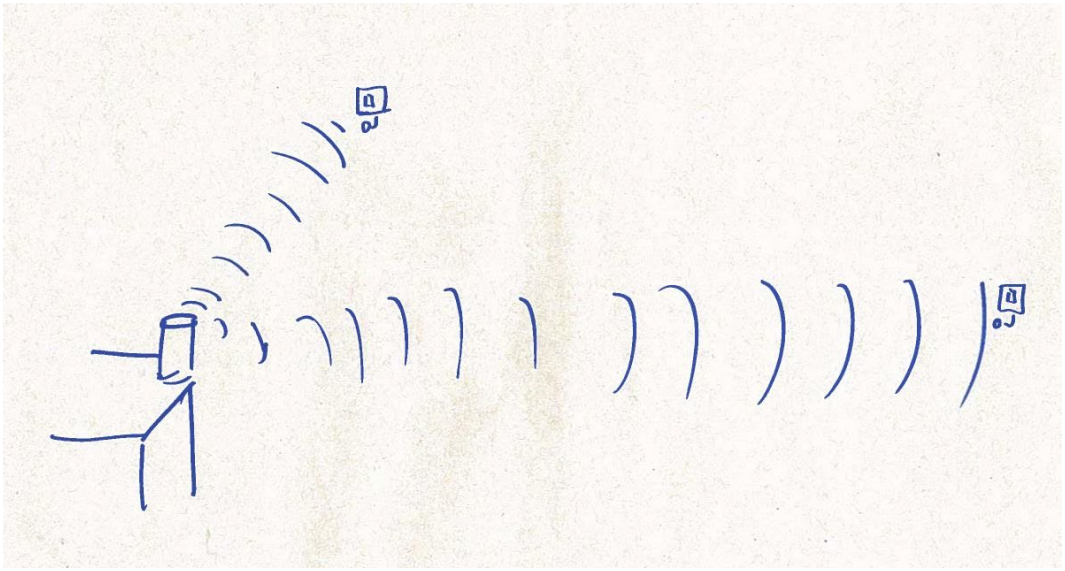
User Model – Smart Light



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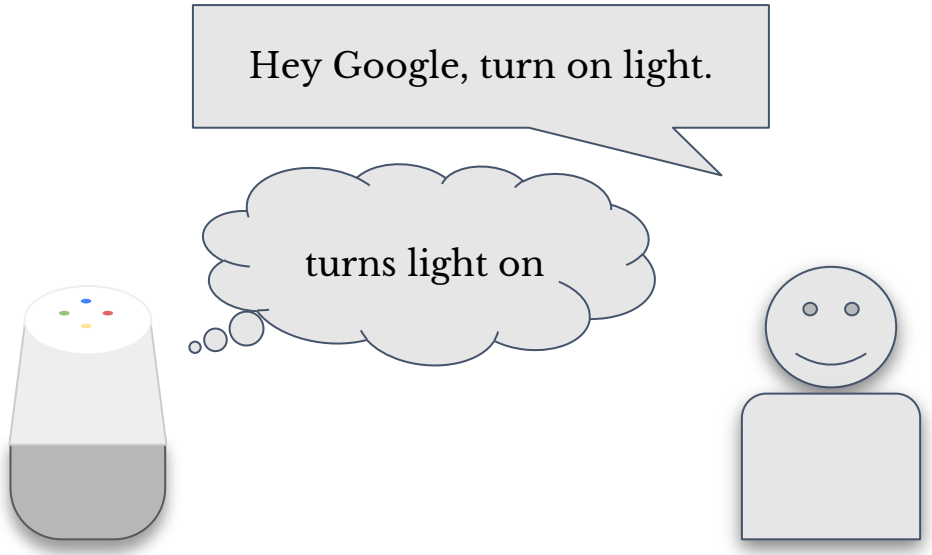

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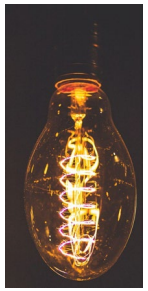
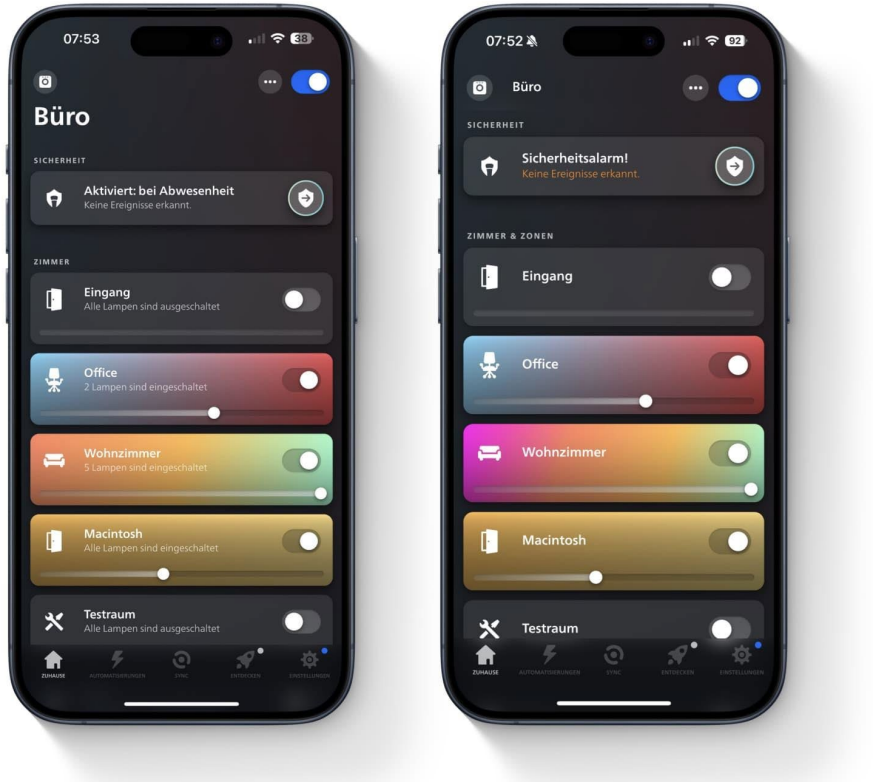
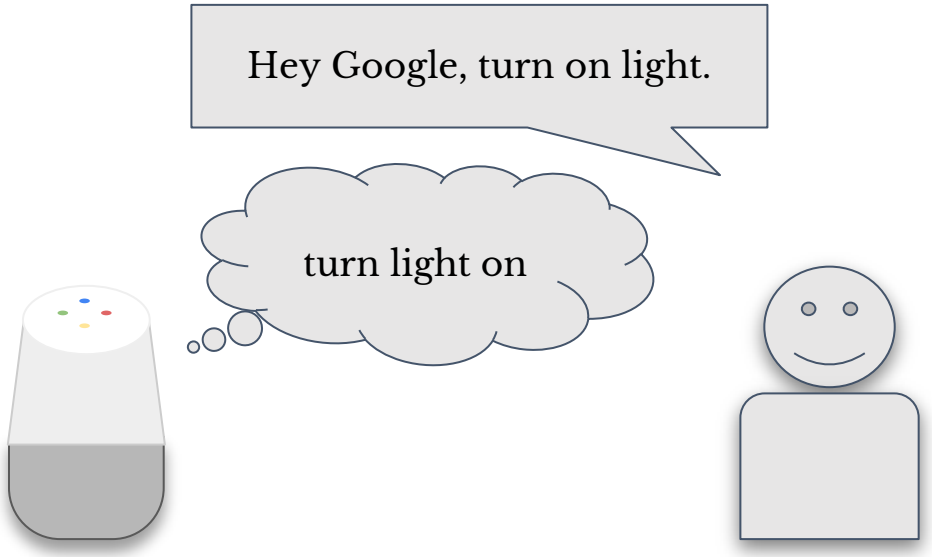
UI Model – Smart Light



Two ways to interact:



Via Smartphone App



Via Voice Interaction

image from https://hueblog.com/2024/03/12/not-a-mistake-but-intentional-cleaned-up-home-page-in-the-hue-app/

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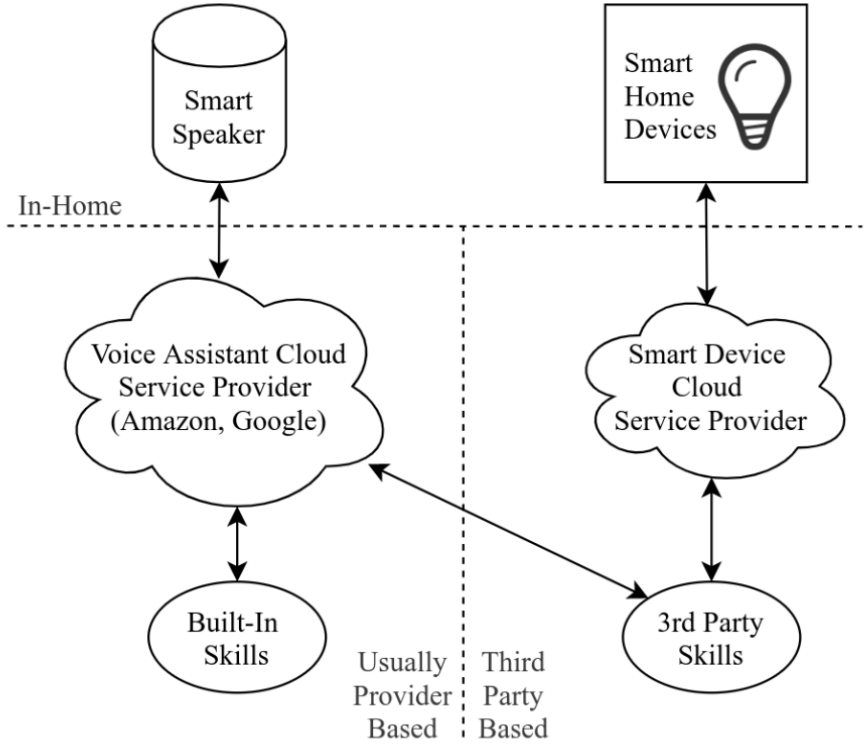
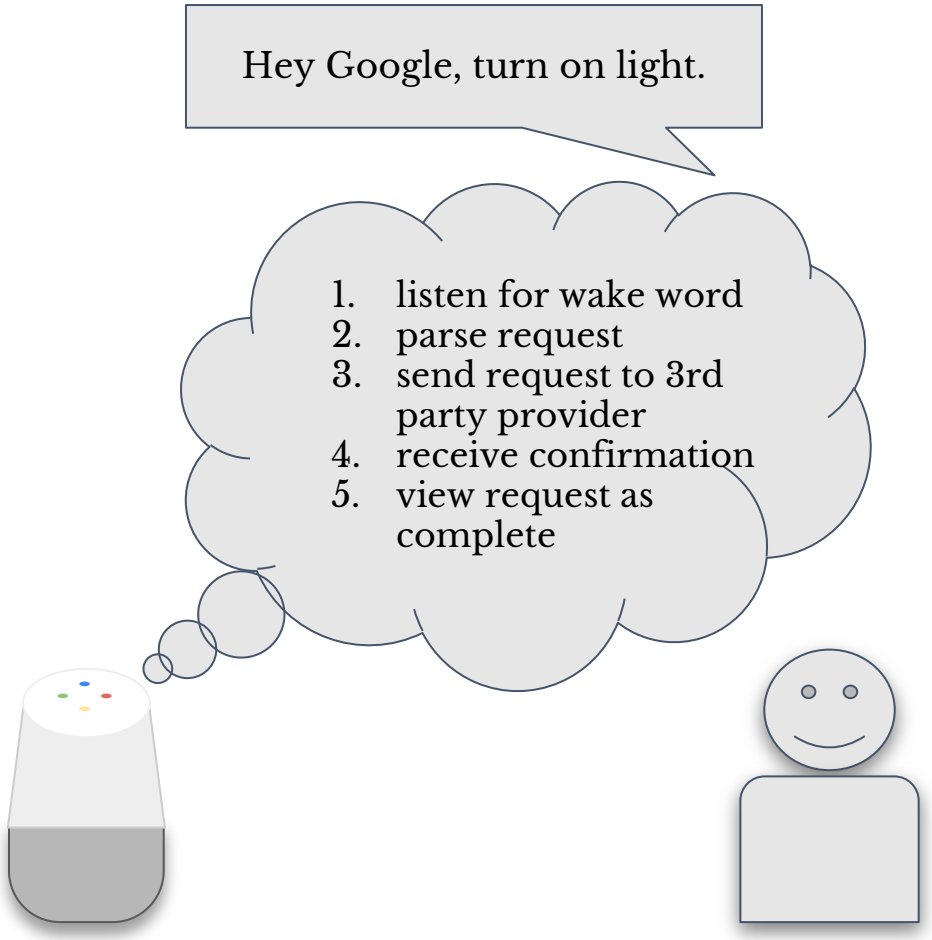
Implemented Model – Smart Light

How is it actually implemented:



Graphic from Meng et al.*



Input and output match user expectations

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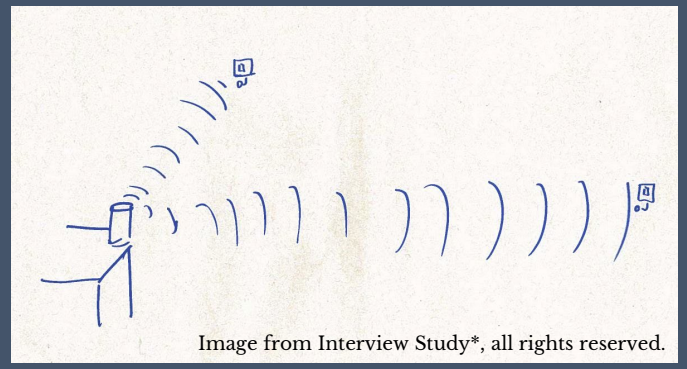
Activity



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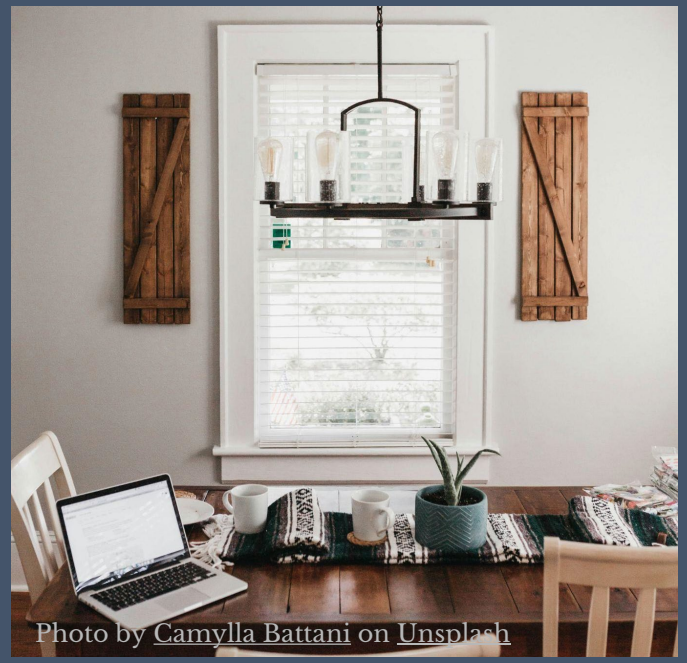

Photo by Camylla Battani on Unsplash

Influence of mental model on user experience

Pair up and consider the smart light case study.

1. Assume users have the just described mental model. How could it influence their
   a. Interaction?
   b. Ability to install the device?
   c. Ability to recognise and recover from errors?
   d. Awareness of risks?
   e. General feeling about the system?

2. How might a mental model that is closer to the implementation model influence the aspects above?

next steps

- Today – 15:30 – 16:30
  - Online drop-in session

HCI lecture - optional drop-in session | Meeting-Join | Microsoft Teams

- Week 09: People & layout