

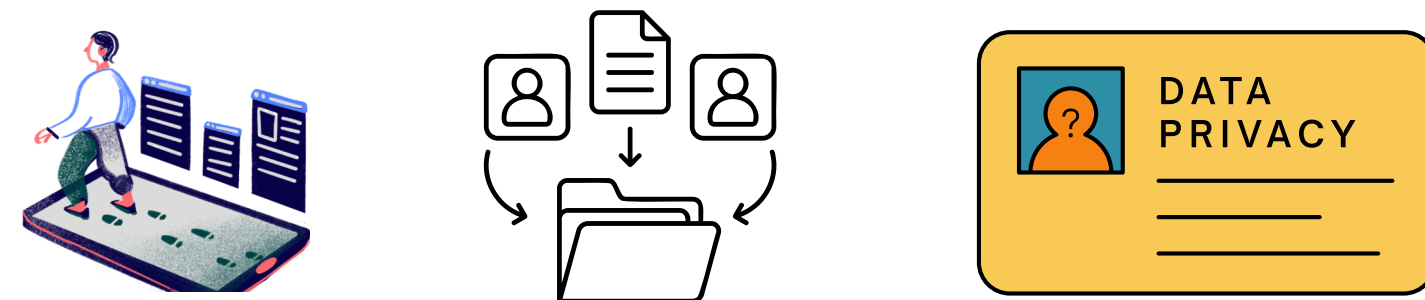
“Why is Everything in the Cloud?”

Co-Designing Visual Cues Representing Data Processes with Children

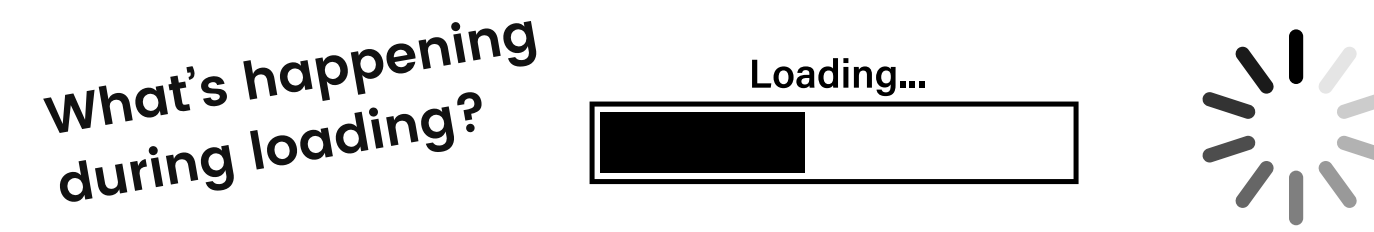
01 Introduction

Children’s data are often collected when they use digital technologies. It’s important to understand and support children’s data and privacy literacy on:

- What data is
- How data is collected, stored, shared, and used
- The privacy implications of data practices



Children rely on visual cues to navigate the digital world. We leverage “loading” screen, a data processing timing, to communicate data concepts.

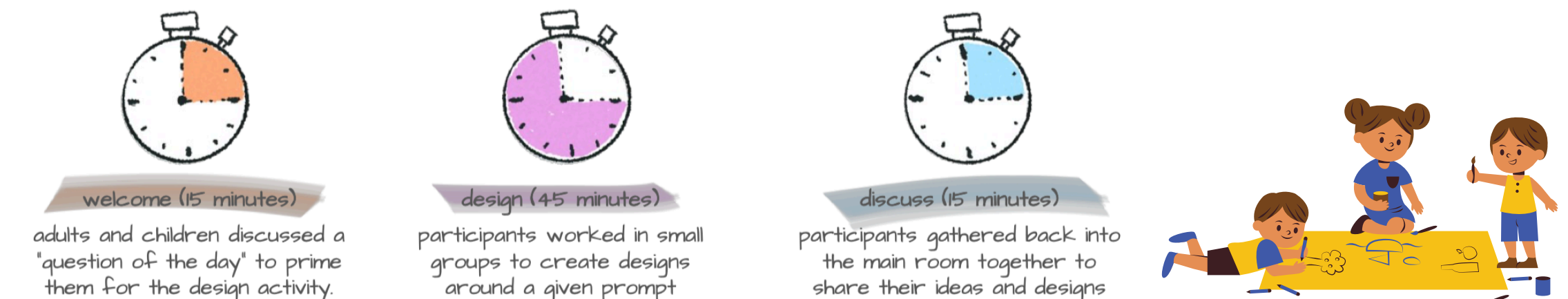


- RQ1: How do children conceptualize data flows and existing related visual cues in a co-design setting?
- RQ2: How might we incorporate children's co-designed ideas when designing visual cues to support children's understanding of data flows?

02 Methodology

Participatory design sessions with KidsTeam at University of Washington

- 12 children (age 7-12)
- 5 design sessions (DS1-DS5) over 3 phases in 6 months
- In each design session: 2-3 children paired with 1-2 adults

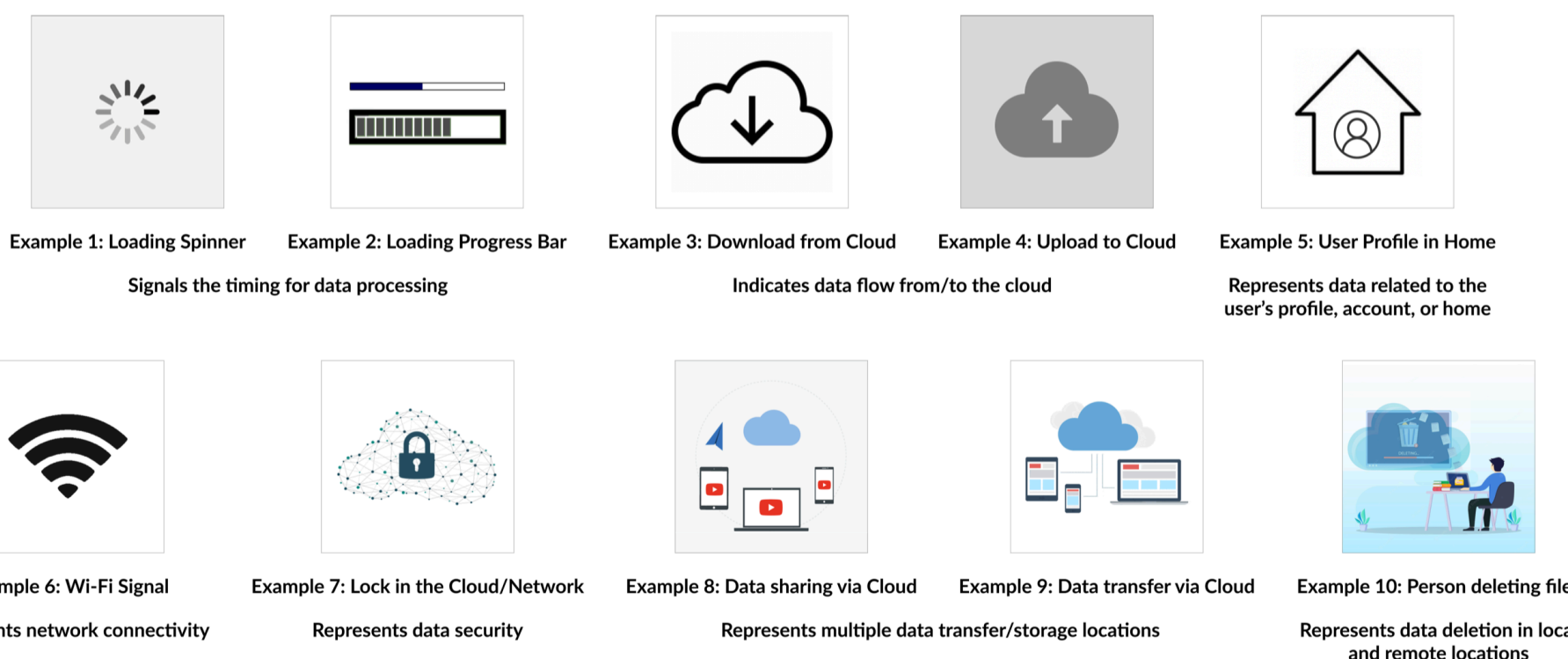


03 Findings and Design Narratives (3 Phases)

Phase 1: Children’s baseline understanding of data concepts and related visual cues

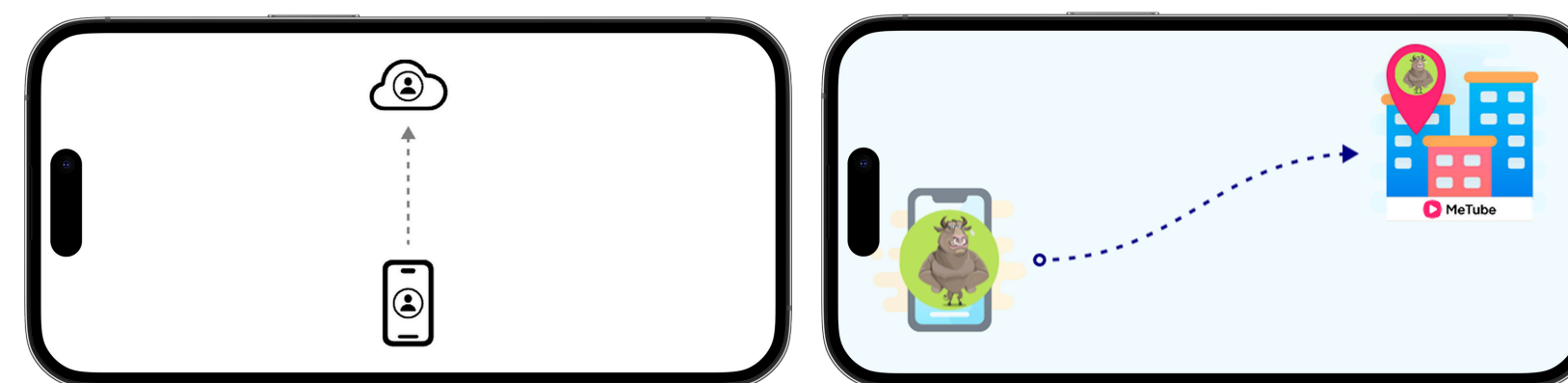
Phase 2: Translating phase 1 findings to VI visual cue designs, and elicit children’s feedback

Phase 3: Discussion of data flow concepts and elicit feedback on revised cues via fictitious app



- Leveraged loading to display data process visual cues
- Used concrete representations to show data types
- Showed the relationship between the device and the company (data center) during data flow

VI Cue Design: Loading During Profile Creation



Symbolic Style Concrete Style

- Concrete depictions of data was helpful
- Children designed the cue for data center as cloud+building

Revised Cue Design: Loading During Profile Creation



Symbolic Style Concrete Style

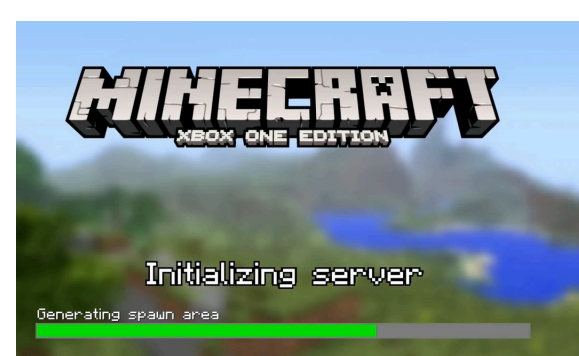
The combined cloud and building cue signifies physical data storage location to children:

“the cloud of information.” (Daniel)
 “data cloud” (Isaiah), and that it is a place that
 “has data on us.” (Namjoon)

04 Education, Design, and Policy Implications

Supporting children's data & privacy literacy

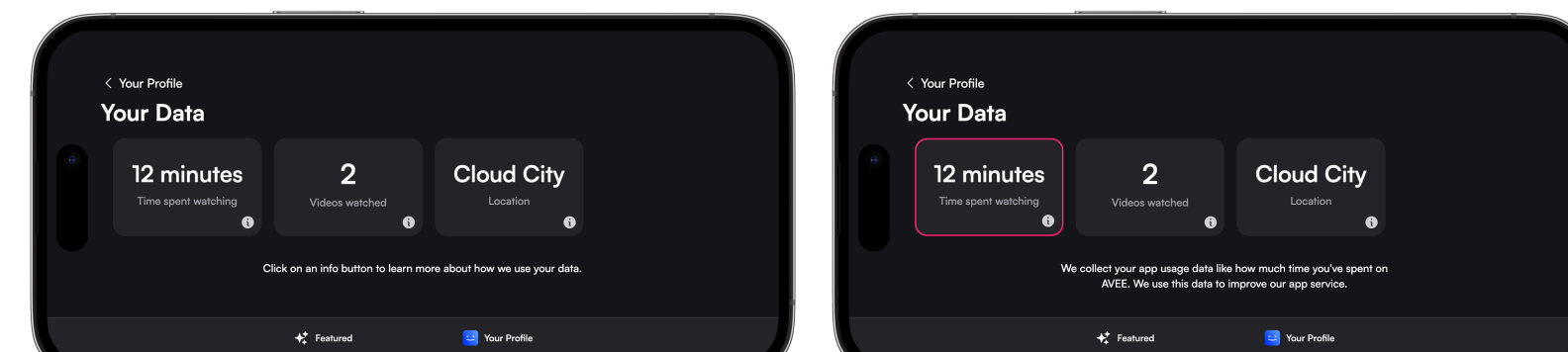
- Leverage visual cues could foster children’s data literacy
- Include commercial privacy aspects in teaching data literacy



Use game loading screen to communicate data processes

Designing cues to reveal hidden data processes

- Embed cues in the user experience, creating “just in time” learning
- Design concrete and context-dependent visual cues
- Include a “view my data” button for transparency



Recommendation for regulation on Age-Appropriate Design

- Require companies to provide evidence of involving children in design processes
- Require companies to demonstrate that resulting designs are understandable by children of different ages

Sun et al. “Why is Everything in the Cloud?”: Co-Designing Visual Cues Representing Data Processes with Children. Proceedings of the 23rd Annual ACM Interaction Design and Children Conference. 2024.

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