Designing for Playful Interactions at a Hands-off Evolving Exhibit

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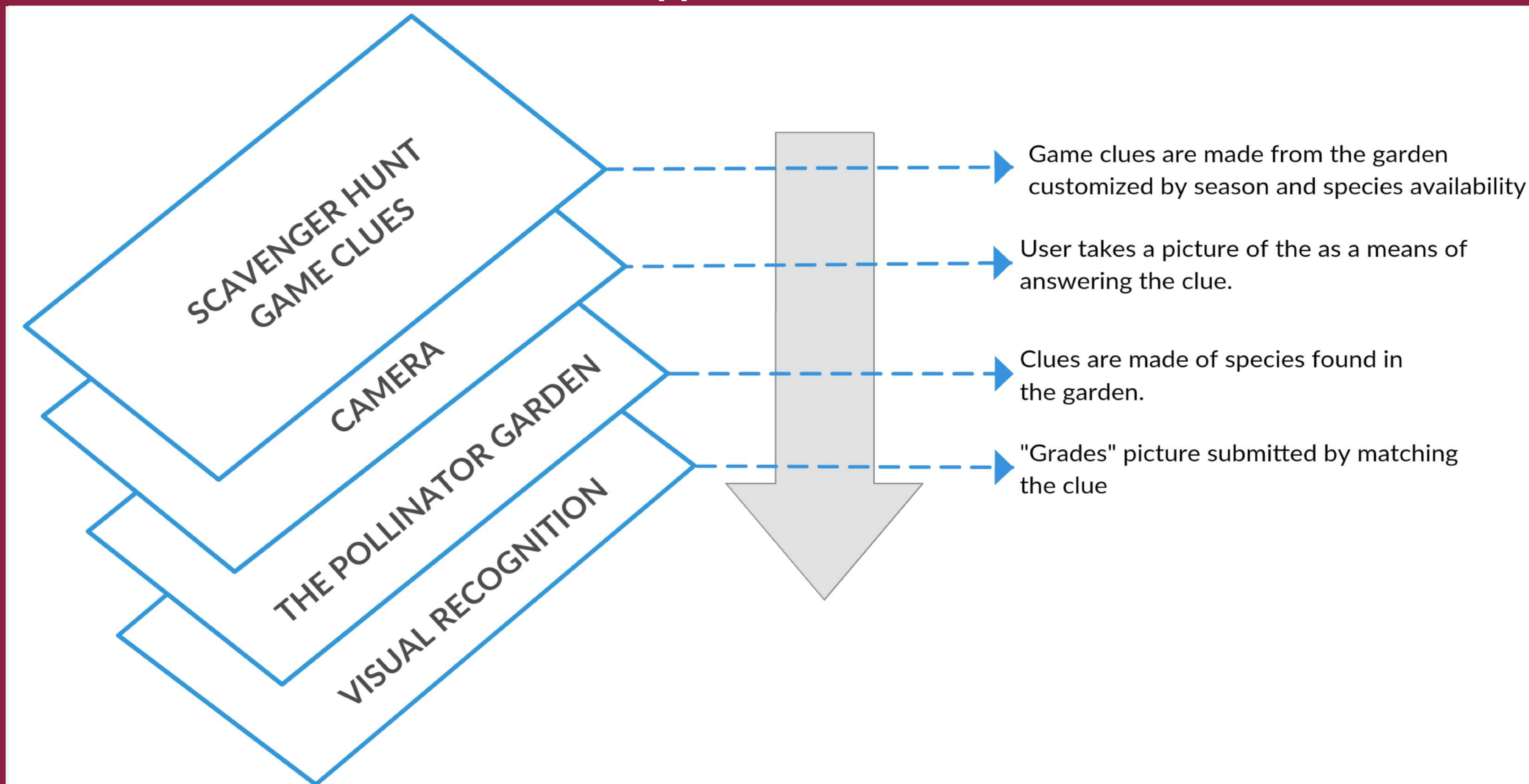
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Abstract

How do we provide hands-on interactivity with an exhibit that one cannot touch? We consider this question when designing for a means of interaction with a garden exhibit housed within a science museum. Our approach leverages mobile phones ubiquity, supporting group interactions and gamification in approaching this conundrum. We then designed *GardenHunt* -- a mobile application that leveraged visual recognition in a scavenger hunt game that we deployed and tested in-situ at the museum with children in field trips, teenagers in self-guided explorations, and parent-child dyads in a day-long showcase. We find that compared to non-participants, our design approach notably improved interactions with the garden exhibit and best used the (limited) time available for exploration. We also discuss new insights learned from this atypical exhibit, together with implications on how interaction patterns and group dynamics are changed in the presence of technology.

The *GardenHunt* Mobile Application


Mobile Application Framework

- Game clues are made from the garden customized by season and species availability
- User takes a picture of the as a means of answering the clue.
- Clues are made of species found in the garden.
- "Grades" picture submitted by matching the clue

The use of *Levelling* to provide for similar interactions while catering for cognitive levels

	Level Characteristics	Clue Output to Player	Clue Input to Machine
Beginner	• Straightforward clue • Broad answer	"Find a Butterfly"	"Butterfly"
Intermediate	• Indirect clue • Broad answer	"I fly, I flit, I flutter from flower to flower… What am I?"	"Butterfly"
Advanced	• Indirect clue • Narrow Answer	"King" of the flitters	"Monarch buttefly"

Table 1: Characteristics of "levelling": providing a level of challenge for each

App Use: Out of Context, Other Context, and Within Garden Context

We tested the application in three ways: Within the indoor pollinator garden at a science museum, in a typical garden and completely outside the garden context at a showcase to compare app use, and to measure for extensibility and reuse.
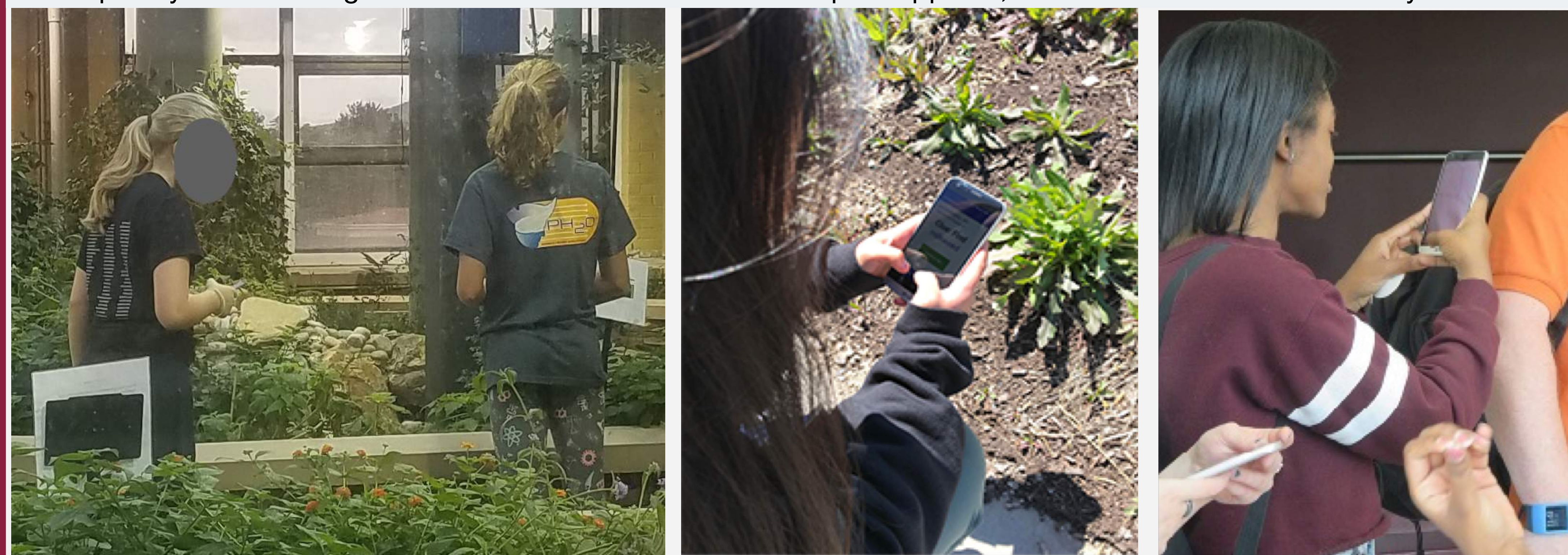
Findings: App (Mis)use

- **Privacy:** Taking selfies with the application without understanding the privacy implications.
- **Permissions:** Children using parent's phones was common, and this has design implications about parental informed consent
- Attention: App allowed for a balance between time-on task and exploration

Other Findings

- Children with app interacted more with the garden than those without
- "levelling" allowed for same interaction across age groups, but at different cognitive levels
- The use of timers made for race-against the clock conditions, undermining self-explorations.
- Children tended to explore in groups, even as each had their own mobile phones.
- Modularity in App design made for an easier process of encouraging and allowing application re-use.
- When considering interactions, fun trumps learning as a primary goal/focus.

Acknowledgements