HCI Week 2: Design Requirements and how to gather them

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Part of slidedeck inspired by Dr Kami Vaniea

Overview

1. Overview of Coursework 1
2. Design requirements and features
3. Methods to gather design requirements
4. Activity

Coursework 1

You will work in teams of 3 or 4 to create a more usable version of a course. You will be using the content from an existing course to create an improved design of both Learn, Open Course, and the course content presentation. Your redesign forms the basis for CW2 and CW3, as you will then evaluate and improve other group's designs.

Due: Week 3 - October 4 12:00pm (noon)

Formative

CW1 report template and instructions available

Coursework 1 Steps

Step 1: Find a team and register on Learn (due Wednesday September 25)

Step 2: Background research - reflect on your own experiences, Learn Foundation Project, interview other students (activity on Friday)

Step 3: Select a course to improve

Step 4: Pick a student persona

Step 5: Define the problem - discuss what your group feel are the most interesting or serious issues that students are facing, consider your persona

Step 6: Possible tasks - use the problems you would like to solve to create a task to test your new design

Step 7: Design iteration and mock-up the design

Step 8: Write the report

Features are not requirements.

Data Visualisation Platform for Cotton Growers

Design Brief

Build a data visualisation platform for cotton growers in Australia to be able to visualise the number of birds and bats on their farm

- Why cotton growers?
- Why birds and bats?
- Why a data visualisation platform?

Data Visualisation Platform for Cotton Growers

Research

Phase 1: Semi-Structured Contextual Interviews

- Current use of technology and how this is integrated into the farm
- Motivations around biodiversity and sustainability, how cotton growers currently track biodiversity and sustainability markers, and learn about the birds and bats on their farm
- Boundaries around data privacy, including how and where data is shared

Data Visualisation Platform for Cotton Growers

Findings

- Cotton growers only have a general interest in knowing what birds and bats are on their farm
- The main interest in the platform is its potential for pest management, which stems from the drive not to use pesticide or insecticide sprays on the cotton for both environmental and economic reasons
- Cotton growers mainly interested in knowing the number of insect-eating bird and bat species, and their activity over the cotton crop to include as part of their decision making process around the use of sprays. They also wanted to know how to attract more of these species to their farms.
- Cotton growers already used a data visualisation platform to visualise what farmer was growing what crops and where. They wanted to know the specific location of the sensor on their farms to make informed decisions. They also wanted to know what species were on other farms.

Data Visualisation Platform for Cotton Growers

Requirements

- Know where their sensors where on their farm and where the sensors were on others farms
- Know the number of insect-eating bird and bat species on their farm and their activity over the cotton crop
- Get information on insect-eating bird and bat species and how to attract them/keep them on the farm
- Understand their species diversity in comparison to other farms in their area

Sensor View

Requirement: Know where their sensors where on their farm and where the sensors were on others farms

Feature: a dashboard which displays a map view of the farm with markers to indicate where the sensors are placed

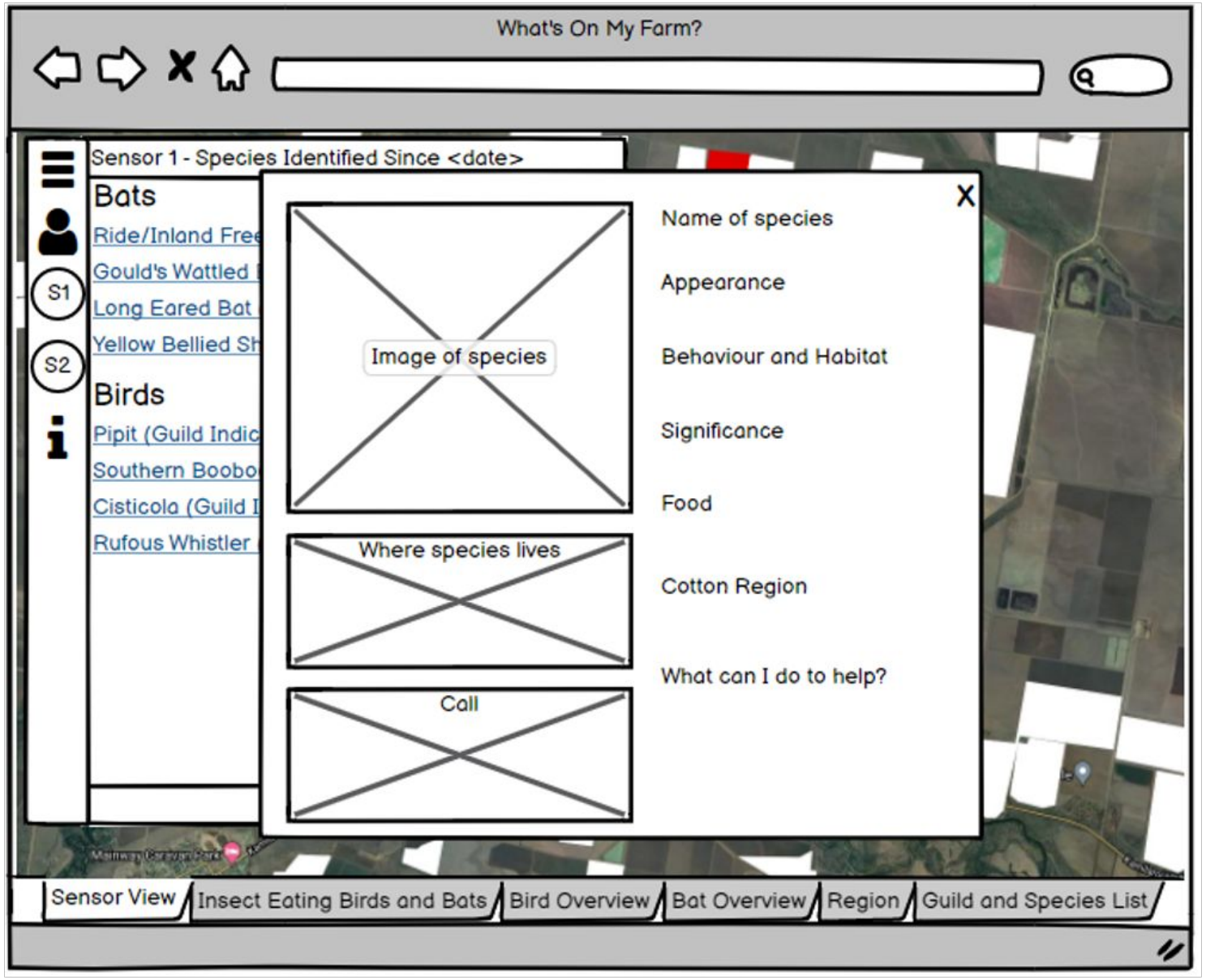
Sensor View

Requirement: Get information on insect-eating bird and bat species and how to attract them/keep them on the farm

Feature: A pop-up that appears when a sensor is clicked that displays a list of the species detected on that sensor.

Sensor View

Feature: When the species name is clicked, a pop-up will appear with information about that species.



Insect Eating Birds and Bats

Requirement: Know the number of insect-eating bird and bat species on their farm and their activity over the cotton crop

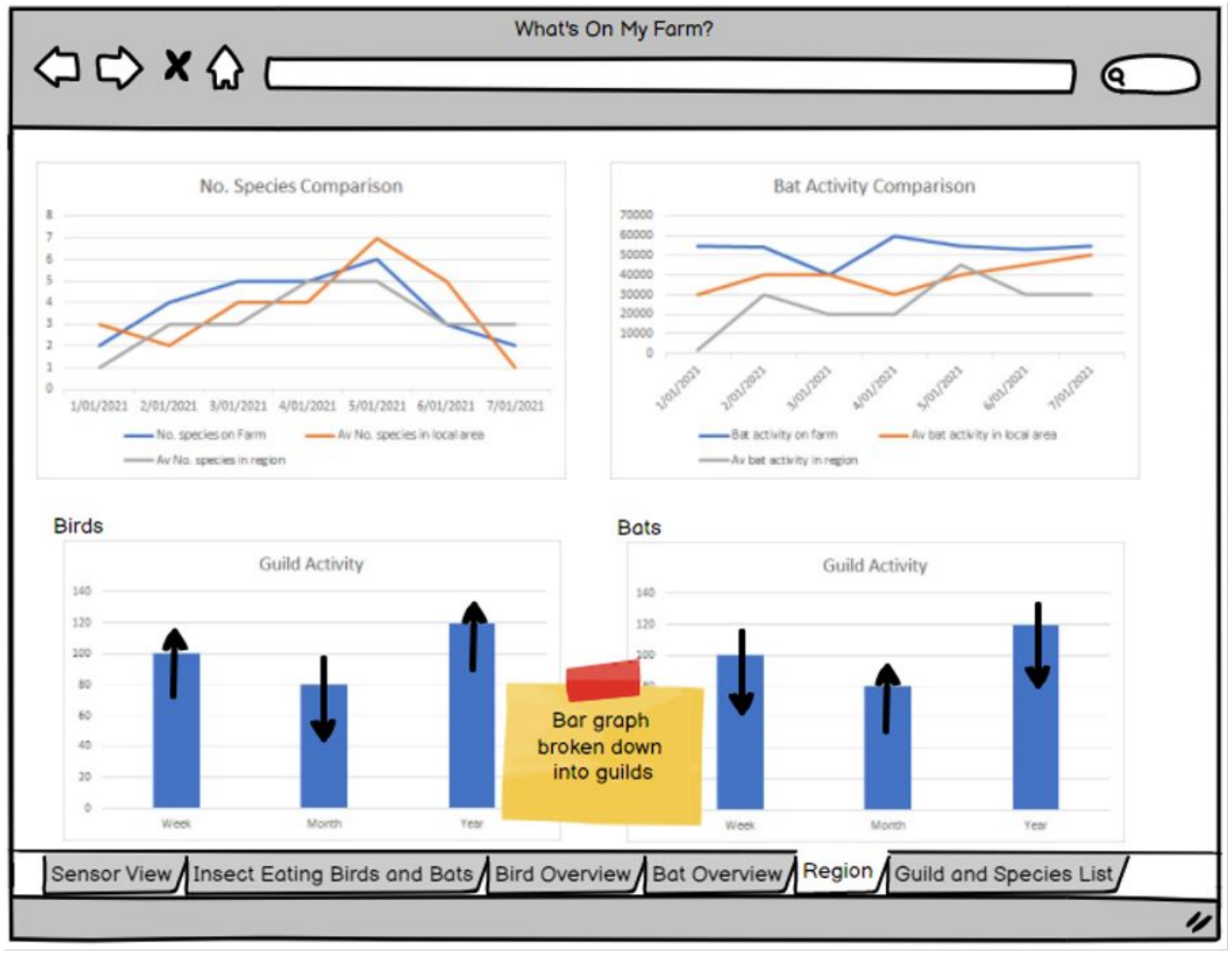
Feature: Dashboard contains graphs with the following information:

- Number of insect-eating bird species.
- Number of insect-eating bat species.
- Insect-eating bat activity – line graph.
- Insect-eating bat activity

Region Comparison

Requirement: Understand their species diversity in comparison to other farms in their area

Feature: Dashboard contains graphs with data for comparison



How do we gather design requirements?

Many methods to gather design requirements

- Reading background literature
- Surveys
- Diary studies
- Interviews with users and/or experts
- Focus groups
- Contextual inquiries
- AEIOU (UMD #2)*
- Artifact analysis
- Personas

*https://medium.com/the-31-5-guy/the-aeiou-framework-for-design-8b7eff95c796
** described in separate videos

Literature Review

- Someone might have studied your type of project
- Prior research may have a list of requirements for specific user groups or tasks (e.g. children, autism, visually impaired)
- Review of similar systems that we can learn from
- **When to use:**
  - Checking prior work is <u>ALWAYS</u> a good idea.

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ORIGINAL PAPER

Designing Serious Game Interventions for Individuals with Autism

Elisabeth M. Whyte · Joshua M. Smyth · K. Suzanne Scherf

Published online: 10 December 2014

Abstract The design of "Serious games" that use game components (e.g., storyline, long-term goals, rewards) to create engaging learning experiences has increased in recent years. We examine of the core principles of serious game design and examine the current use of these principles in computer-based interventions for individuals with autism. Participants who undergo these computer-based interventions often show little evidence of the ability to generalize such learning to novel, everyday social communicative interactions. This lack of generalized learning may result, in part, from the limited use of fundamental elements of serious game design that are known to maximize learning. We suggest that future computer-based interventions should consider the full range of serious game design principles that promote generalization of learning.

Keywords Autism · Serious game · Virtual reality · Technology · Computer-based intervention · Cognitive training

Introduction

There is an emerging field of intervention research that is designed to enhance cognitive and social skills, with the ultimate goal of improving psychosocial outcomes in both

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mental health and developmental disorders (e.
and Kurtz 2013). Some of the best exar
research include interventions that remedi
deficits in schizophrenia, which ultimately ir
functioning for these patients (e.g., Meda
2009). Increasingly, researchers are turning
ized versions of these interventions because o
scale them up and transport them easily, but
of the ability to employ strategies for increa
motivation and personalizing training, w
enhances learning (Saperstein and Kurtz 201

In the field of autism research, compute
ventions are being used to improve emot
identity recognition abilities (e.g., Tanaka
Wainer and Ingersol 2011) as well as langua
skills (e.g., Grynszpan et al. 2014). This appr
inspired, in part, by findings that children wit
their typically developing peers) often e
computer games in their discretionary time (
Kuo 2011; Kuo et al. 2013). In addition, the
game environment provides a safe and nc
context for practicing and acquiring new and
(Kapp 2012). Unfortunately, many of these
puter-based interventions for autism have
evidence of learning generalization or im
psychosocial outcomes.

Here, we argue that computerized inte
individuals with autism may be much more
motivation can be improved and learning ca
alized by leveraging principles from another e
of "serious game design" in educational
Freitas 2006; Dickey 2006; Habgood and Ain
To make this argument, we first explain
games are and how they are fundamentally
entertainment games. Second, we show how

Retrospective Survey

- Ask people about things that have happened to them in the past using a survey format
- **When to use:**
  - **Critical** events that users are likely to remember well – Describe a negative software update experience.
  - **Recent** events that were somewhat memorable – Where did you have dinner last night?
  - **Rare** events that had a large impact and are memorable – How did your partner propose to you?
- **Why not to use:**
  - Hard to remember events – How many times did you cross a road last month?

Diary Study

- Ask people to record events as they happen
- **When to use:**
  - **Rare events –** Some events are rare and cannot be easily observed
  - **Easily forgotten –** People forget that some events even happen
  - **Actual frequency important –** People forget how often they do things. For example, how many glasses of water have you had today?
- **Cons:**
  - Study changes behavior – asking people to track their behavior tends to cause them to change their behavior

Interviews

- A participant has a discussion on a topic directed by a researcher
- **When to use:**
  - During initial discovery (before you have a product to test) to uncover people's experiences, problems, behaviour and opinions
  - To test concepts and early ideas for possible solutions
  - As a follow-up to usability tests, when it's important to have users articulate their decisions and experiences
  - After a product has launched, to understand evolving user needs and expectations
- **Why not to use:**
  - If you need more insight into context

https://www.userinterviews.com/ux-research-field-guide-chapter/user-interviews

Focus Groups

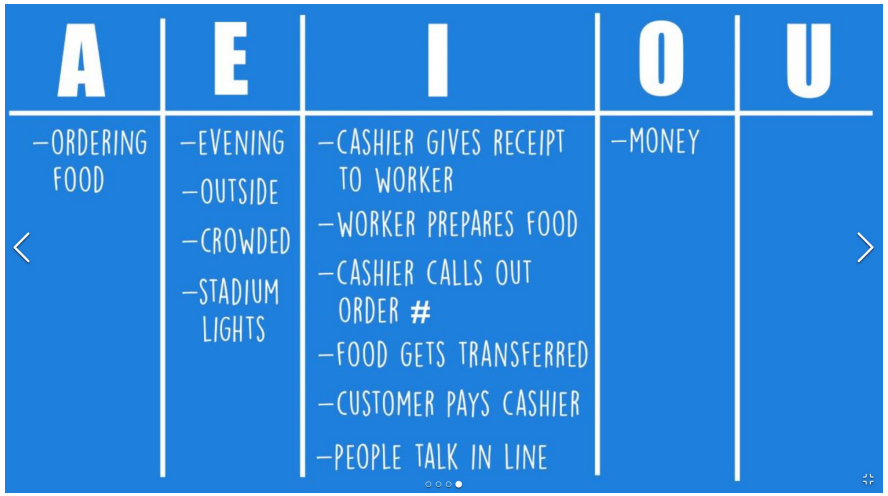
- A group of participants have a discussion on a topic directed by a researcher
- **Pros:**
  - Get group opinion about issues
  - Efficient way to test early ideas/designs
  - Good way to identify issues or areas of conflict
- **Cons:**
  - Can be taken over by assertive individuals
  - Focus on people's opinions, not actual behaviours
  - Limited sample size

Contextual Inquiry

- Similar to an interview, but done in the context where the participant is likely to interact with the technology
- **Pros:**
  - Rich data
  - Get to see the space where users normally interact with your technology
  - Opportunity to identify ‘obvious’ things that users sometimes don’t mention
- **Cons:**
  - Time consuming
  - Less structured data which can be hard to analyse
  - May require special permission to visit and record space

AEIOU (UMD #2)

- Design Thinking Framework to “structure all observations you make in the field during user research”*
- **When to use:**
  - documenting observations e.g. contextual inquiry
- **When not to use:**
  - conflicting methods like interviews



*https://medium.com/the-31-5-guy/the-aeiou-framework-for-design-8b7eff95c796
image from https://openpracticelibrary.com/practice/aeiou-observation-framework/

Artefact Analysis

- Look at the “things” people leave around in the world to understand a problem
- **When to use:**
  - **Physical spaces –** Workflows tend to generate physical artifacts which say a lot about how people work
  - **Tasks involve artifacts –** Goal task involves artifact creation. I.e. Microsoft Word
  - **Interactions generate artifacts –** For example, emails, social media posts, etc.
- **When not to use:**
  - There are no meaningful artifacts
  - It is faster to learn the information another way – artifact analysis can take some time

Personas

- A short representation of a fictitious user that describes a reasonably large segment of your intended user population
- **When to use:**
  - After requirements gathering to represent outcomes to others
  - During design to help envision the user
  - During evaluation to envision the user's goals and abilities
- **Pros:**
  - Easy to understand
  - Good for communicating who the user is
- **Cons:**
  - Can ignore less-common users

Activity

- Sit in groups of 3 or 4 within your section
- Discuss which method/s you think are most suitable to collect design requirements for your assigned design brief
- Share with the class

Section 1:

- Investigate how social media platforms contribute to the spread of conspiracy theories among users

Section 2:

- Design and build an augmented reality application to assist people in evacuating buildings during an emergency

Section 3:

- Design and build an application to support people's self-care practices

Section 4:

- Design and build an application to improve patient's experiences in healthcare settings

Homework

- Register team on Learn or fill in form to be assigned a team
- Reflect on your own experiences with Learn and Open Course
- Go through the Learn Foundation Project materials
- Select a course to improve
- Set up Figma
- Week 2 Quiz is live

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