



# HCI Week 3: Design Requirements

Uta Hinrichs & Tara Capel

# today

- Design requirements and features
- Methods to gather design requirements
- Activity

**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

**Participants:** 8 cotton farmers across QLD and NSW

### **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 markers, and learn about the birds and bats on their farm
- Boundaries around data privacy, including how and where data is shared

### **Phase 2: Co-design workshop**

- Created potential assets/features for the platform and other materials to explore its design with cotton growers

# 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

**What are the requirements for this platform?**

# 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 ALWAYS a good idea.

## Designing Serious Game Interventions for Individuals with Autism

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

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**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

mental health and developmental disorders (e.g., Kapp and Kurtz 2013). Some of the best examples of research include interventions that remediate deficits in schizophrenia, which ultimately improve functioning for these patients (e.g., Medalia 2009). Increasingly, researchers are turning to computerized versions of these interventions because of the ability to scale them up and transport them easily, but also because of the ability to employ strategies for increasing motivation and personalizing training, which enhances learning (Saperstein and Kurtz 2011).

In the field of autism research, computer-based interventions are being used to improve emotion recognition abilities (e.g., Tanaka and Sengco 2007) as well as language skills (e.g., Grynspan et al. 2014). This approach is inspired, in part, by findings that children with autism (who typically develop peers) often enjoy playing computer games in their discretionary time (e.g., Kuo 2011; Kuo et al. 2013). In addition, the computer game environment provides a safe and novel context for practicing and acquiring new and complex skills (Kapp 2012). Unfortunately, many of these computer-based interventions for autism have not shown evidence of learning generalization or improved psychosocial outcomes.

Here, we argue that computerized interventions for individuals with autism may be much more effective if motivation can be improved and learning can be enhanced by leveraging principles from another area of “serious game design” in educational games (Freitas 2006; Dickey 2006; Habgood and Ainley 2011). To make this argument, we first explain why serious games are and how they are fundamentally different from entertainment games. Second, we show how

E. M. Whyte (✉) · K. S. Scherf  
Department of Psychology, Pennsylvania State University, 110  
Moore Building, University Park, PA 16802, USA  
e-mail: emv131@psu.edu

J. M. Smyth  
Department of Biobehavioral Health, Pennsylvania State  
University, University Park, PA, USA

# 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

# 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 on the field during user research”\*
- When to use:
  - documenting observations e.g. contextual inquiry
- When not to use:
  - conflicting methods like interviews

A	E	I	O	U
-ORDERING FOOD <	-EVENING -OUTSIDE -CROWDED -STADIUM LIGHTS	-CASHIER GIVES RECEIPT TO WORKER -WORKER PREPARES FOOD -CASHIER CALLS OUT ORDER # -FOOD GETS TRANSFERRED -CUSTOMER PAYS CASHIER -PEOPLE TALK IN LINE	-MONEY	>

\*<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

# **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

- Reflect on your experience with Learn and Open Course
  - Issues
  - Things that work well
  - Features

# next steps

- Wednesday, Oct. 1; 2-3pm
- **Usha Kaseria Lecture Theatre – Old College**
- Interviews (structured, semi-structured, unstructured)