chapter 5

interaction design basics

HCI Focus of Design

- Some of HCI is focused on understanding: the study of the way people interact with technology.
- However, a large part of HCI is about doing things and making things that is called a design

what is design?

achieving goals within constraints

Goal

- What is the purpose of the design we are intending to produce?
  - Who is it for?
  - Why do they want it?
- For example, if we are designing a wireless personal movie player, we may think about young affluent users wanting to watch the latest movies whilst on the move and download free copies, and perhaps wanting to share the experience with a few friends.

Constraints

- How much can it cost?
- How much time do we have to develop it?
- Are there health and safety issues?
- In the case of the personal movie player: does it have to withstand rain?

Trade-off

- Choosing which goals or constraints can be relaxed so that others can be met.
  - For example, we might find that an eye-mounted video display, a bit like those used in virtual reality, would give the most stable image whilst walking along.
- However, this would not allow you to show friends, and might be dangerous if you were watching a attention-grabbing part of the movie as you crossed the road.

golden rule of design

understand your materials

for Human–Computer Interaction

understand your materials

- understand computers
  - limitations, capacities, tools, platforms
- understand people
  - psychological, social aspects
  - human error
- and their interaction …

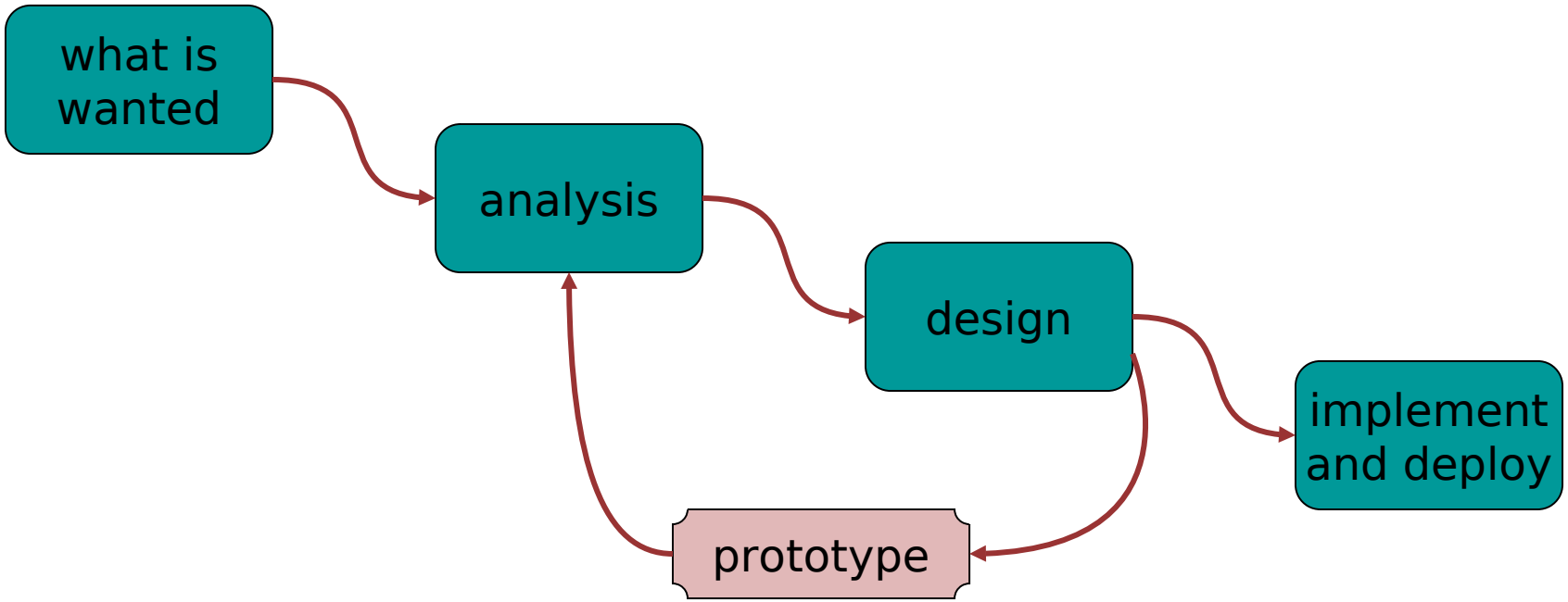
To err is human

- accident reports ..
  - aircrash, industrial accident, hospital mistake
  - enquiry … blames … 'human error'
- but …
  - concrete lintel breaks because too much weight
  - blame 'lintel error' ?
    … no – design error
    we know how concrete behaves under stress
- human 'error' is normal
  - we know how users behave under stress
  - so design for it!
- treat the user at least as well as physical materials!

The process of design

- Often HCI professionals complain that they are called in too late.
  - A system has been designed and built, and only when it proves unusable do they think to ask how to do it right!
  - In other companies usability in seen as equivalent to testing called checking.

The process of design



Requirements

- What is wanted?
  - The first stage is establishing what exactly is needed. As a precursor to this it is usually necessary to find out what is currently happening.
  - For example, how do people currently watch movies? What sort of personal appliances do they currently use?

Requirements

- There are number of techniques used of this in HCI:
  - Interviewing people,
  - Videotaping them,
  - Looking at the documents and objects that they work with,
  - Observing them directly.

Analysis

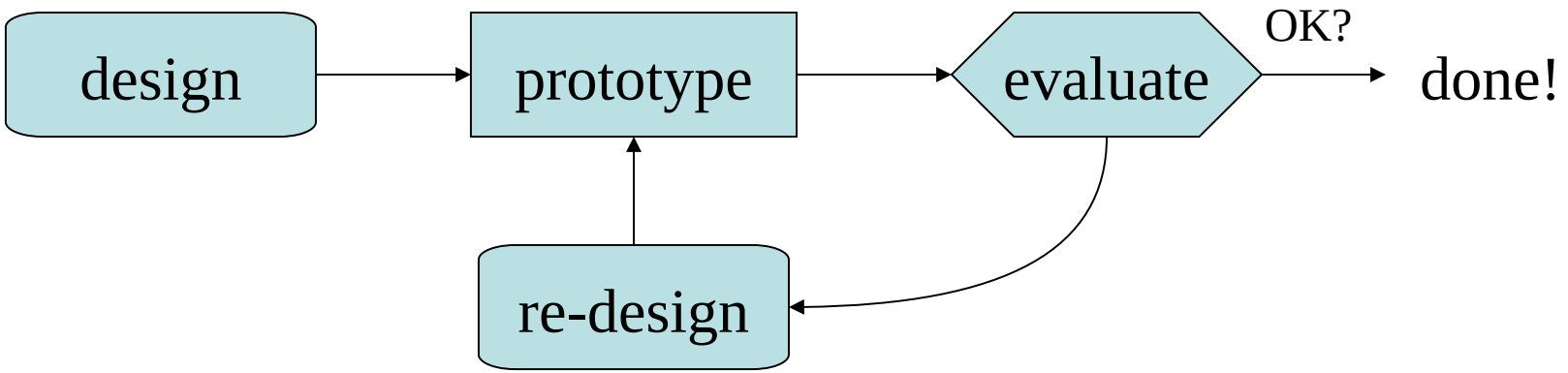
- The results of observation and interview need to be ordered in some way to bring out key issues and communicate with later stages of design.

Design

- We need to record out design choices in some way and there are various notations and method to do this.
- Its about designing the concept of the system called conceptual design.

Iteration and prototyping

- Humans are complex and we cannot expect to get design right first time.
- We therefore need to evaluate a design to see how well it is working and where there can be improvements.



Implementation and deployment

- We need to create and deploy design.
- This will involve writing code, perhaps making hardware, writing documentation and manuals

user focus

know your user

personae

cultural probes

know your user

- who are they?
- probably not like you!
- talk to them
- watch them
- use your imagination

persona

- description of an ‘example’ user
- use as surrogate user
- details matter

> *“Personas are the single most powerful design tool that we use. They are the foundation for all subsequent goal-directed design. Personas allow us to see the scope and nature of the design problem... [They] are the bright light under which we do surgery.”*
>
> *— Alan Cooper, Software designer, programmer and the “Father of Visual Basic”*

example persona

Betty is 37 years old, She has been Warehouse Manager for five years and worked for Simpkins Brothers Engineering for twelve years. She didn't go to university, but has studied in her evenings for a business diploma. She has two children aged 15 and 7 and does not like to work late. She did part of an introductory in-house computer course some years ago, but it was interrupted when she was promoted and could no longer afford to take the time. Her vision is perfect, but her right-hand movement is slightly restricted following an industrial accident 3 years ago. She is enthusiastic about her work and is happy to delegate responsibility and take suggestions from her staff. However, she does feel threatened by the introduction of yet another new computer system (the third in her time at SBE).

cultural probes

- direct observation
  - sometimes hard
    - in the home
    - psychiatric patients, …
- probe packs
  - items to prompt responses
    - e.g. glass to listen at wall, camera, postcard
  - given to people to open in their own environment they record what is meaningful *to them*

scenarios

stories for design

use

scenario – movie player

Brian would like to see the new film *Moments of Significance* and wants to invite Alison, but he knows she doesn't like 'arty' films. He decides to take a look at it to see if she would like it and so connects to one of the movie-sharing networks. He uses his work machine as it has a higher bandwidth connection, but feels a bit guilty. He knows he will be getting an illegal copy of the film, but decides it is OK as he is intending to go to the cinema to watch it. After it downloads to his machine he takes out his new personal movie player. He presses the 'menu' button and on the small LCD screen he scrolls using the arrow keys to 'bluetooth connect' and presses the 'select' button. On his computer the movie download program now has an icon showing that it has recognized a compatible device and he drags the icon of the film over the icon for the player. On the player the LCD screen says 'downloading now', with a per cent done indicator and small whirling icon.

During lunchtime Brian takes out his movie player, plugs in his earphones and starts to watch. He uses the arrow keys to skip between portions of the film and decides that, yes, Alison would like it. Then he feels a tap on his shoulder. He turns round. It is Alison. He had been so absorbed he hadn't noticed her. 'What are you watching', she says. 'Here, listen', he says and flicks a small switch. The built-in directional speaker is loud enough for both Brian and Alison to hear, but not loud enough to disturb other people in the canteen. Alison recognizes the film from trailers, 'surprised this is out yet' she says. 'Well actually . . .', Brian confesses, 'you'd better come with me to see it and make an honest man of me'. 'I'll think about it', she replies.

Figure 5.4 Scenario for proposed movie player