# Design & evaluation in the real world: communicators & advisory systems




# The aims

- Show how design & evaluation are brought together in the development of interactive products.
- Show how different combinations of design & evaluation methods are used in practice.
- Describe the various design trade-offs & decisions that have to be made in the real world.



# Key issues: From requirements to design

- which design cycle to use
- which combination of methods to use when designing & evaluating a product
- what happens when the product being developed is confidential and there are no users available to test it?
- how many users should be involved in tests?
- what to do with the evaluation findings
- how much to expect from users



# Case study1: Designing mobile communicators

Two examples, for very different audiences:

- Nokia's mobile communicator
- Philips communicator for children

# Designing Nokia's mobile communicator

- design cycle:
  iterative user-centered approach
- which methods:
  ethnographic research
  scenarios and task models
- confidential product issues:
  first in the market is key
  evaluation must be very limited and no real users



# Designing Nokia's mobile communicator (contd)

- physical aspects:
  screen size
  number of buttons versus functionality
- consistency issues
  internal consistency (within mobile software)
  external consistency (with desktop software)
- user testing
  none before release
  summative testing & questionnaires after



# Designing Philips' communicator for children

- design cycle:
  iterative and evolutionary
- which methods:
  low-fidelity prototyping
  participatory design
  interface metaphors
- physical aspects:
  color, shape, size, robustness
  pen input
  bags to protect screen



# Designing Philips' communicator for children

- user involvement:
  children involved throughout
  prototypes evaluated constantly
  invaluable insights for the designers
- lessons learned:
  agree on assumptions in requirements
  think of follow-on projects early on
  users are not designers
  act quick and dirty if necessary

## Case study 2: A telephone response information system (TRIS)

- Interactive voice response systems are common in government offices and large companies. Do you know of examples that you have used?
- Why are these systems often so frustrating to use? Forming a mental model is difficult because there is no visual feedback and the user must remember the menu structure
- Many menus and deep menus are particularly difficult



## Why was TRIS difficult to use?

- Having to remember the menu structure.
- The programmers traded computational elegance for usability, e.g., the system asked for social security number and employee identification number, confusing users who did not have both.
- TRIS was comprised of different systems each with its own interaction style. Users were not told this but when they moved between the systems they experienced sudden, unexplained changes.



## How was TRIS evaluated?

- A combination of techniques were used:
  - a review of the literature provided information about problems with interactive voice response systems
  - expert reviews
  - GOMS analysis of the proposed redesign
- The redesign was implemented
  - usability tests confirmed that the redesigned system offered better usability than the original design



## Why was using different methods valuable?

- The evaluators were able to build-up a broad picture of usability problems.
- Using GOMS and heuristic evaluation they could explore the potential benefits of the redesigned system.
- User testing enabled them to confirm that the redesigned system offered better usability.
- User satisfaction questionnaires confirmed that users preferred the redesigned system.

# Key points

- Design involves trade-offs
- Design space for making changes when upgrading a product is limited
- Cycles of rapid prototyping and evaluation allow designers to examine alternatives
- Simulations are useful when evaluating systems used by large numbers of people
- Piecing together evidence from a variety of sources can be valuable