Design of Interactive Systems (DIS)
Lecture 5: Essential of Designing Interactive Systems- HIC

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Overview

The Home Information Centre (HIC)

- In this chapter, a case study will be used to illustrate many of the features of the design and evaluation of interactive systems that you have encountered.

- The case concerns the development of a new concept for a device known as the Home Information Centre (HIC).

- It was a real project in which a research centre was leading the interaction design component.

- Design team of full-time designers and 2 PhD students

- Scenario based design methods have been used

Aim

- Understand how to undertake an interaction design project

- Discuss how design decisions are made in an interaction design project

- Understand the trade-offs that are inherent in such a project

- Appreciate the central role of evaluation in design.

Introduction

- The concept for the HIC came from the observation that there are two typical situations in the home.

- The TV, video, DVD and music centre are in the living room. It is a 'lean- back' situation, where people are being entertained and where they relax

- In the home office there is a PC. It is a 'lean-forward' situation where people are actively engaged with and focused on producing things.

- Poor uptake of devices such as WebTV suggests that neither the lean-forward situation of a PC nor the lean-back situation of a TV in a living room will be the right device for new services such as home banking, shopping and so on.

- Instead, a new device, the Home Information Centre, HIC, is proposed.

- This should be a device where people can get at and provide information while they are occupied with other household activities

Infotainment

- Infotainment is a term intended to convey a mixture of information and entertainment

- 'edutainment' (education and entertainment) and 'infomercial' (information and commercial, or advertising) are increasingly common.

- Technologies similarly converge: a phone and a camera, for example, or a PDA and an MP3 player.

- One of the challenges for interactive systems designers is to understand when and where it is appropriate to converge technologies

HIC

- The project was established to explore the concept of an HIC to see whether full-blown manufacture of such a device was sensible.

- Many parallel activities in the project to do with issues such as market analysis, hardware costs and so on.

- The abstract concept of an HIC as a device to deal with 'a move-around situation for infotainment' was initially translated into a number of high-level features and functions

HIC

- Two key features were required: an intuitive navigation support system and a flexible query system. The software should provide the following:
  - An abstract representation of the contents of information sources that should be extracted and maintained semi-automatically
  - Speech, pen, touch and keyboard as input
  - Sound, images, text and animation as output
  - Speech recognition (SR)
  - Natural language (NL) queries
  - An intuitive user interface.

HIC

- The industrial partner also imposed a key constraint on the project: ***the HIC should not look or behave like a PC***.

- Interested in alternative interface designs in the project - having a design that did not include scrolling or window management.

- The project plan specified that the HIC would be developed as a series of prototypes, leading to a final pilot-like complete system.
  - *Prototype P0*
  - *Prototype P1*
  - *Prototype P2*
  - *Prototype P3*

HIC

- ***Prototype P0*** should be delivered by the end of month 6, and was to be used for the very first 'discount' engineering experiments with the HIC system to aid in the design specification. P0 would not contain software.

- ***Prototype P1*** delivery by the end of month 13, used for the first lab experiments collecting data on usage, interactions and natural language query system. First version of display visualization, control module, interaction module etc.

HIC

- ***Prototype P2*** delivery by the end of month 19, and used for full lab experiment at first and then in real user homes. Would be used for final version of HIC. Include full monitor set-up. Client and server module will be running in full.

- ***Prototype P3*** was to be the final official version of the HIC, usable for demonstrations and for the possible basis of further exploitation. It would correspond to P2 but with corrections and enhancements made following the experiments.

Scenarios for the HIC

- *PACT* can be used to help to think about conceptual scenarios of use. The possibilities of using HIC were brainstormed for the HIC design.

- Three general usage were found, informational, communicational and entertainment

- The informational scenarios concerned activities such as finding a recipe, going for sailing etc.

- The entertainment scenario led to ideas that users might like to play a game, find some sport, watch TV on demand. It would be possible to have a chat room running alongside a TV programme and so on.

- Other scenarios included integration with other devices, such as heating control, home security and so on.

Scenarios for the HIC

- from a high-level PACT analysis, it was needed to cover the different people - children, people with disabilities, as well as the young and wealthy who would be the early adopters of such technology.

- It was needed to cover a variety of information with rapidly changing information against those with static information, different media such as maps, voice, sound output and so on.

- Eleven scenarios constituted the final scenario corpus that was used in the project:.

Scenarios for the HIC

- What shall we have for dinner?

- What shall we do now?

- News and e-books

- Entertain me

- Message board

- Traffic

- New users

- Housekeeping

- Payment

- I cannot get my phone to work because …

- Planning ahead.

Take one of the scenario ideas above, undertake a PACT analysis and brainstorm how the scenario might unfold

A future workshop

- Prototyping is important to know how to use the product.
- Scenarios were used internally within project team and also outside the team as a basis of "Future workshops".

A future workshop comprises three stages:

1. *Critique.* This is a group brainstorming session that tries different approaches to the activities/problems being addressed by the proposed system. A set of themes arising out of this stage is used in stage 2, fantasy.

2. *Fantasy.* The emphasis here is on creative solutions/ideas, no matter how unrealistic. From these a number of fantasy themes are generated and these are then used to drive stage 3.

3. *Implementation.* The groups work out what would be necessary in order to produce a real solution to some of the fantasy themes generated (e.g. by producing a mock-up or a storyboard).

Developing the scenario

- At one of the workshops, one group took the 'What shall we do now?' scenario and discussed it in more detail.
- The overall context for the scenario was the large arts festival that takes place in Edinburgh every August.
- It was envisaged that the HIC would be an ideal device for finding out what was going on so that people could decide 'What shall we do now'
- The discussion at the workshop resulted in the development of more detailed personas.

Developing the scenario

1. The couple should be aged 20-30. They lived in Edinburgh. It was August and the Edinburgh Festival was in full swing. The couple knew about the Edinburgh Festival and wanted to check out what was on that evening. They did not have much time.

2. What sort of a query would they enter? Broad categories of shows such as 'comedy', time constraints such as 'starting after 6 pm', specific artists or shows or a specific venue (because a venue might have a particular specialism)?

3. What would be on the HIC? For example, would there be text only, or pictures/icons? Would there be advertising? Would people enter a free-form query or browse through an online catalogue? This was an issue that the content or service provider would need to deal with.

Developing the scenario

4. The modality of the input was considered. Would the HIC have handwriting recognition? Should it be an iPad or tablet PC? Should there be voice input for free-form queries, a keyboard, remote keyboard or on-screen keyboard?

5. Once the name of the actor/venue, etc. had been input, people would get some display on the HIC which was dependent on the number of results of the query and the list of categories. Would the categories be generated automatically, or be preset?

6. Queries would need a response time of 5-10 seconds. People would make a selection 'check out show times' - perhaps by touching an icon, perhaps by saying 'show times'. They might be using a remote control - how far could the person be from the screen?

7. Once the HIC had displayed the show time, venue, names of actors, any reviews of the show, etc., the person might want to make a booking. The display would be dependent on the history of the interaction and the visualization of the query history. Then all the issues of how to go back, up, etc. through the interaction history would need to be addressed.

Developing the scenario

8. The booking of tickets would probably require a different service or content provider. Would the HIC then 'lose control' of the interface or could the HIC provide its own to someone else's (e.g. the Festival Theatre's) website and online booking facility? How would the person input their name, credit card, address, etc.? Preferably this would be automatic.

9. Would the HIC be able to show the number of seats remaining for a show? Would the tickets be printed on a local printer? There was a need for a function of the HIC that automatically kept people informed of a changing situation: an interface agent perhaps, or just part of the interface?

10. The brainstorming continued - what if there was a need to contact friends about the show, send them details of the location, etc.? They might want to meet for a drink nearby - in which case, could the HIC access a webcam in the pub to see how busy it was?

Developing the scenario

11. Issues of traffic then arose. How long would it take to get there? What about providing bus or taxi information? The need to have the HIC provide a map or print instructions was recognized - and this should be able to happen from different locations.

12. The group changed the context to explore other areas such as going skiing or sailing, but apart from the issue of scale - the information space of skiing is much larger than the information space of the Edinburgh Festival - few new issues arose. How to update the service or content providers was important and there was some discussion about security, personalizing the HIC, etc.