

Situated Displays...

Supporting Community and Coordination

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C46

Situated Digital Displays...

- What do we mean?
- Is this a situated display?

Background (1)...

- Fundamental to this notion of 'situated' is the notion of 'place'
- Harrison and Dourish (1996): "a space which is invested with understandings of behavioural appropriateness, cultural expectations, and so forth".

Harrison S and Dourish. P. (1996) Re-place-ing space: the roles of place and space in collaborative systems, *in Proc. of CSCW '96*, ACM Press, pp. 67-76.

Background (2)...

- As Mitchell (Mitchell, 2005:9) eloquently states:
- *"Literary theorists sometimes speak of text as if it were disembodied, but of course it isn't; it always shows up attached to particular physical objects, in particular spatial contexts, and those contexts-like the contexts of speech-furnish essential components of the meaning."*

Mitchell, W.J., (2005). *Placing Words : Symbols, Space, and the City*, MIT Press.

Background (3)...

- O'Hara et al. (2002) -
- "In recent years, more and more information is being presented on dedicated digital displays situated at particular locations within our environment. At their most basic, digital display technologies allow information to be more easily updated dynamically and remotely. However, these new kinds of interaction technologies also allow people to use these situated displays in novel ways both as for the individual's purposes and in the **support of group work**."

O'Hara, K. E. Churchill, M. Perry, D. Russell, N. A. Streitz, (2002) Public, Community and Situated Displays: Design, Use and Interaction around Shared Information Displays, www.appliancestudio.com/cscw/cscwdisplayworkshopcall.htm

Is this a Situated Display?

- Would it be appropriate if any of you could start adding your own content?
- How about if you could control navigation through slides?

Previous Key Work...

- Supporting Community and Cooperation
 - Portholes (Xerox media lab – 1990s)
 - Provided 'peripheral awareness' in a research lab – supported notions of community
 - Deployed/Evaluated over many years
 - Control and Privacy Issues
 - Dynamo (Interact Lab, University Sussex – 2002 -> 2005)

Dourish, P. and Bly, S. 1992. Portholes: supporting awareness in a distributed work group. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (Monterey, California, United States, May 03 -07, 1992). P. Bowersfeld, J. Bennett, and G. Lynch, Eds. CHI '92. ACM Press, New York, NY, 541-547.

Dynamo (1)

- **Dynamo** is a public multi-user interactive surface that supports the cooperative sharing and exchange of a wide range of media.



Dynamo (2)

- Video...

Issues...

- Control to Post?
 - Is this restricted?
 - Potential Problems?
- Notion of Gifts (*cf* Taylor 2003)...

Taylor, A. S., & Harper, R. (2003). The gift of the gab: a design oriented sociology of young people's use of mobiles. *Journal of Computer Supported Cooperative Work (JCSCW)*, 12(3), 267-296.

Case Study 1

HERMES: Exploring messaging with situated displays in Lancaster's Computing Department

HERMES...



Situated in the aesthetics ??

Motivating Scenarios (1)

- A lecturer, Keith, is commuting to work when he encounters a traffic jam. He feels anxious because he thinks this will make him late for an arranged appointment with a student. Now stuck in the stationary traffic he gets out his mobile phone and texts a message to the display outside his office door which states that he will be running at least one hour late. He has previously experienced problems getting through to department secretaries to write such messages and, anyway, would feel slightly uncomfortable having to ask a secretary to carry out the task.

Motivating Scenarios (2)

- A student arrives at Keith's office, on time, only to see that Keith is running at least one hour late – she scribbles a note on the door saying that she will return after lunch.

So who are the users?

- Owners
 - People with Offices in the Department
 - Lecturers, Secretaries, RAs etc.
- Visitors
 - All of the above + Students, family, friends etc.

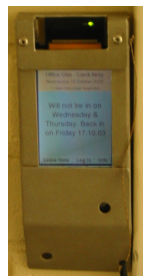
Contrasting properties of digital with Post-it Notes...

- Control of various dimensions
 - Remote Interaction...
 - Leaving & Reading, Owner & Other
 - SMS (MMS...), Web portals...
 - Visibility/Privacy...
 - Who can leave public messages
 - Who can remove messages



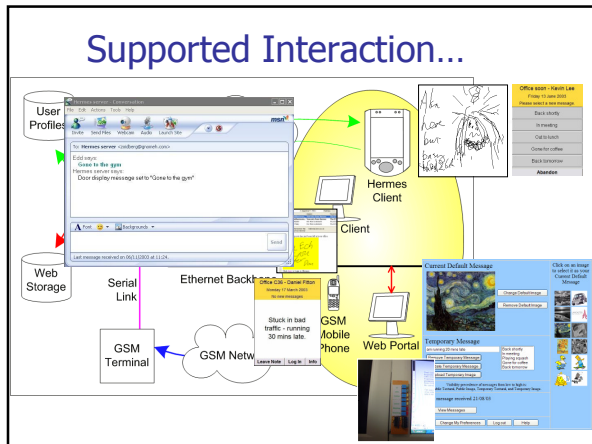
Information Appliance?

- Initial Idea was to design as an information appliance
 - Simplicity over excessive Functionality
 - Case Design...
 - But small screen meant either Owner Message or Visitor Scribble UI modes...



Approach...

- Iterative/Phased development
 - Initially deployed with 'friendly' users, wider deployment as reliability increased
 - Additional functionality/changes occurred through consultation with users - UCD
- Evaluation/Exploration of use
 - Qualitative
 - Observation!, questionnaires (open format), semi-structured interviews, etc.
 - Quantitative
 - questionnaires (likert based), analysis of usage logs



Usage from logs...

- Use
 - 5500 messages set by owners
 - 750 messages set by visitors
 - Log analysis
 - Uptake of features
 - "In big q at post office.. Will be a bit late"
 - "Running late - with you soon neil. B."
 - Impact of features...
 - Prior to '2 touch' set msg feature
 - Avg 3 mgs per day
 - Post to '2 touch' set msg feature
 - Avg 9 mgs per day
 - Awareness Info/Sharing context
 - Approx 98% contain some aspect of sharing context
 - 19% refer to location
 - 54% refer to temporal
 - 48% referred to activity

=====

User Name: Julius Smith
Time: 12:52
Date: 07/11/02
Message Type: TEMPORARY IMAGE

=====

OUT TO LUNCH!
Content: ACTIVITY

=====

User Name: June Doe
Time: 16:54
Date: 07/11/02
Message Type: TEMPORARY TEXTURAL
Message: Out to lunch - back at 2
Content: TEMPORAL ACTIVITY

=====

User Name: Jo Blogs
Time: 18:23
Date: 07/11/02
Message Type: TEMPORARY TEXTURAL
Message: Gone to the gym
Content: ACTIVITY

=====

Awareness Issues...

- **Maintaining a Sense of Presence/Reason for absence:**
 - "Working at home today – reviewing papers".
 - "Working at ISS this morning".
- **Accuracy and Deliberate Imprecision**
 - "Back in 10 minutes"
 - What about automatic countdown feature?
 - Accountability...

Use problems...

- **Trust/Reliability**
 - Has my message been displayed ???
 - Poor feedback
 - Implication of remote interaction and reliability problems, network, code etc.
 - Experience of problems with a given function at an early stage can cause user (quite reasonably) to abandon use of that function.

Fitting in with emergent patterns of use...

- Initially only a single 'public' message...
- Users found cost of changing too high
 - Consequently messages were being left on display...
- Introduced *Temporary & Default* messages
- Introduced feature enabling users to clear temporary message on device itself **and** to select messages.

Current Default Message

Temporary Message

You have 2 new messages

"I usually remember to stick up a post-it note only after locking the door behind me"

Hermes 2...

- 40 displays across 2 floors
- Based around 7 inch touch screen display
 - Change in display size followed 'show room' (bottom left) consultation with users
- Video conferencing capabilities

Case Study 2:

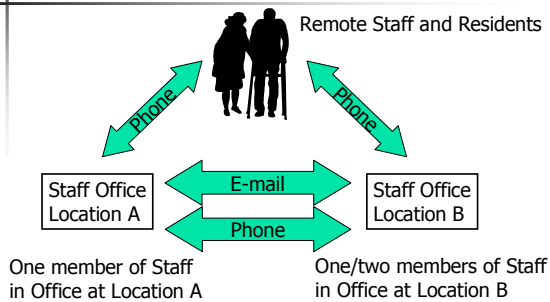
Situated displays to support staff
across geographically remote
offices ...

Understanding the setting...

- A residential hostel (Location A) + supported bedsits (Location B) for former psychiatric patients
 - Encouraging everyday living skills
 - Inappropriateness of current methods for learning about needs of residents
 - Interviews (police...)
 - Questionnaires (claiming social security)
 - Need to establish trust with both staff and residents
 - Use of Cultural Probes...
 - Conducted interviews with Staff and observations.
- One major issue that was revealed was the need for enhanced communication...

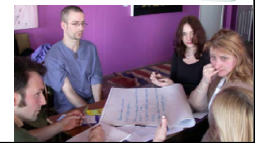


Requirements Capture...

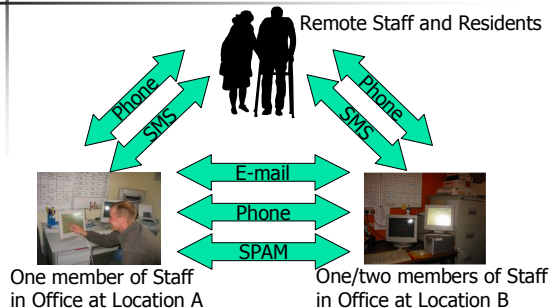


Initial Design Workshop...

- Discussed problems,
 - e.g. engaged phone problems...
- Demonstrated HERMES...
- Staff felt that similar messaging system would be useful
 - Reduce burden on phone
 - Provide lightweight asynchronous communication channel

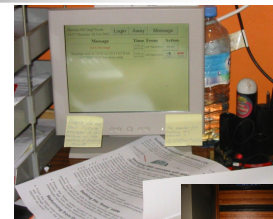


The SPAM solution...

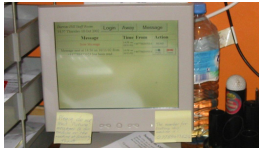


The SPAM Solution...

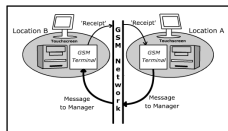
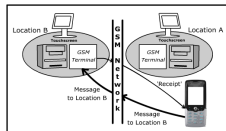
- Didn't want 2nd Phone line
- Low noise,
- Compact,
- Very Simple to use UI
- Font size an issue...
- Acknowledgement feature...



Architecture...



- Data stored locally
- Travel to collect logs
- Alternatives
- Implications ??...



Follow-up Workshop...

- Direct feedback from staff...
 - "We're delighted with it .. we've all started to use it very quickly .. and we're using it a lot"
 - ..I think people at first thought it was going to be really complicated but it couldn't be easier ... we find it extraordinarily useful.."
- But Resident to Staff communication had created an 'incident'
 - A Simple blocking feature was requested by members of staff would prevent from display messages from a blocked mobile phone...

Analysing usage through logs...

- Similar approach to Hermes...

```

sender: +44xxxxxxxxx
date: 02/12/21
time: 16:27:01
message: hi wot time is david calling 2 c bh
--
sender: +44xxxxxxxxx
date: 02/12/22
time: 21:15:43
message: setting of how see you in 5 j
--
sender: +44xxxxxxxxx
date: 02/12/23
time: 09:39:52
message: Going to dentist with Paula at 10. Be in touch when i get back
--
sender: +44xxxxxxxxx
date: 02/12/23
time: 14:39:49
message: Catch have u received your FLAKE DO
--
sender: +44xxxxxxxxx
date: 02/12/24
time: 17:34:59
message: It means that Santa is passing over the house and making his way down
to see me = lucky me
    
```

Over 1500 messages sent over a period of 36 months

Broad Categories of use...

- **Use as Confirmation**
 - Has Fax, email got through?
 - Has x left yet?
- **General coordination between sites...**
 - e.g. Ordering food!
- **Use to signify delays/need for help,**
 - Related to phone use, usually requests for phone to become free.
 - "please ring car wont start so cannot take ph and sm to cc barbara".
- **Coordination with mobile users**
 - e.g. "Pizza & and chips are ready come on in :-)"
- **Remote requests**
 - e.g. request to test the fire alarm
- **Some jokes and general chit-chat etc.**

Issues ??

- HERMES and SPAM deal ostensibly with Messages – But typically content sent to a situated display will share many of the same issues.

Who can send messages to the display and should access to mechanisms for sending messages be shared?

- In Hermes, ostensibly the owner but the 'leave message at door' facility did effectively provide shared access.
 - Inspired some interesting use cases/appropriation.
- Implications for system – is the identity of the sender obvious from the situation?
- In SPAM, access for sending messages was designed to be shared - any member of staff located in the staff room (or via mobile phone) could send.
 - Consequently, some messages where signed.
 - But, control mechanisms were introduced, e.g. blocking feature.

How public/private is the place where the messages will be displayed and who are the potential receivers of this information (1)?

- This leads on to questions of how salient messages should appear in the public setting.
 - With Hermes the overall design of the screen was such that it would not be overly salient to passers by who were not visiting a particular office.
 - With SPAM the font size used was specially chosen so that a resident entering a staff room unannounced would not be able to read a message on the screen.

How public/private is the place where the messages will be displayed and who are the potential receivers of this information (2)?

- Also raises issues of control:
 - whether a received message should be displayed automatically (as in Hermes) or
 - whether some action (e.g. a mouse click) should be required before the message is displayed (as in SPAM).
- In SPAM, the required mouse click on the 'READ' button acted as a confirmation to the message sender
 - implications of providing such a confirmation feature depend strongly on the potential audience, the level of disruption that can be tolerated and the dependability requirements of the particular workplace/setting.

For the creation of messages, what level of expressivity should be supported?

- In Hermes owner had a reasonable choice
 - from highly expressive scribbled messages to prescribed (and very quick to select) short messages,
 - e.g. "Gone for Coffee".
- In SPAM messages were textual
 - but some members of staff did ask for a range of graphical emoticons to be supported.
- The effort required by the user is also related to this issue of expressivity.
- The level of expressivity supported also relates to the extent to which users can direct a message to a particular individual or group and the extent to which they can control the accuracy of the information contained in awareness.
 - crucial if notions of plausible deniability are to be supported.

Other Issues??

- What would be issues if a version of Hermes/SPAM was tailored for use in the home as a supplement to SMS/Phone/IM etc. ??