Asynchronous Use of Large Displays

Charlotte Tang
Oct 24, 2005

Primary sources


Outline

- Study of whiteboard for office use
- Study of whiteboard in a trauma centre
- Design implications
- Flatland
- Study of bulletin boards in public spaces
- Study of information sharing in FXPAL
- Design guidelines
- Plasma Poster

Whiteboard Use in Offices

- Objective
  - To understand the typical uses and affordances of office whiteboards
- Methodology
  - Daily snapshots of whiteboard taken for 2 weeks from 18 participants’ offices
  - Questionnaire and interviews with 9 participants

Mynatt (1999)
Observations

- Managing space
- Tasks
- Frequency of use
- Other issues

Managing Space

- Multiple clusters of content created and maintained on whiteboards
- How the clusters changed over time
- How tasks associated with different clusters
Managing Space

• Getting White Space
  – Clean desk users
  – Space scavengers

• Colour
  – Color choice is generally random and uninformative
  – Some may create colour codes on the fly
  – Usually use a contrasting colour

Tasks

• Reminders
• Quick Capture
• Thinking
Frequency of Use

- Mostly bursty

Other Issues

- Information Sharing
- Choice of Whiteboards
Augmented Whiteboards

• Assumptions:
  – Larger virtual projected space than current whiteboards
  – Segments automatically stored

Desired Features

• Retrieval by time and visual appearance
• Scrollable virtual space
• Connection with PC and PDAs
Quick Highlights

• Limited space in whiteboards
• Erased items cannot be retrieved
• Social relationship plays a role
• Contents are implicitly clustered
• Quick capture, reminders and pre-production tasks are typical

Whiteboard for Medical Use

• A trauma centre with 6 operating rooms
• Operation schedule often requires changes

Xiao et al., 2001
Asynchronous use of large displays

Ethnographic study

- Direct observation, interviewing and photographing
- Observations on how people interact with the board and with other people at the board

Whiteboard for medical use

The OR Whiteboard
Staffing Representation

- Off-duty Staff
- On-duty Staff

12-hour shift
8-hour shift

Messages and Notes

Asynchronous use of large displays
Charlotte Tang 9
Display-based Cognition

• “Problem solving is often done in the context of an external display. Often there are the physical objects that are part of a problem situation” (Larkin, 1989)

Human-Board Cognitive System

• External representation of task status
• Physical manipulation of objects on the display
Types of Interactions

- Negotiation of scheduling solutions
- Joint planning
- “Intra-system” display
- Augmenting inter-personal communication

Design Implications

- Address the workgroup’s existing practices and tasks
- Provide flexibility
- Offer meaningful visual representation
- Allow easy retrieval of information
- Incorporate social protocol
Flatland

- Augmented whiteboard for informal office work

Flatland: Characteristics

- Working area and repository to support thinking tasks and quick capture tasks
- Everyday content
- Clusters of persistent and short-lived content
- Serves for both personal and semi-public roles
Flatland: Space Management

- Auto-segmenting
- Active and Inactive segments
- Moving, squashing and flipping

Flatland: Manipulation

- Freehand strokes with no pull-down menus, buttons, handles, ...
- Behaviours help enhance visual quality and computation
Flatland: Retrieval

- Time-based
- Context queries

Flatland: Contributions

- Techniques for space management
- Flexibly apply behaviours to support varied semantics
- Mechanisms to managing history
Bulletin Boards

Bulletin Boards in Public Spaces

A. Observed public spaces in 3 local areas in SF and Palo Alto
   - Talked to local residents
   - Interviewed 6 local community members
B. Observed use of public poster boards in 3 workplaces

(Churchill et al., 2003)
Observations

• Board location and degree of access
• Content analysis of posted materials
• Usage
• People’s perception of poster boards

Location of Boards

• Where people have time to read (e.g., waiting in a doctor’s waiting room)
• Where people intentionally go to pass the time (e.g., cafes)
• Where people go to seek information (e.g., libraries)
• Where people go to pursue leisure activities (e.g., gyms, community centres)
• Where people routinely walk (e.g., corridors)
Content Analysis

• Reflects the preferred activities and the needs of the local residents
• Posters also indicate temporal scope of relevance
• Content reflected in posting genres

Board Rules

• Branding
• Individualized
Information Sharing within FXPAL

- Observed and photographed activities in public areas, noting people’s movement through the building
- Semi-structured interviews with 17 participants about online and offline information sharing practices within the organization

Observations

- People are often mobile around the building
- Some boards are dedicated to specific types of postings
- Others are for informal communications
Observations

• Most read corkboards placed in areas where people were waiting or engaged in low concentration tasks
• Online sharing is strongly preferred due to low overhead but email is not recommended

Design Guidelines

• Location
  – Interactions between location, content type and people’s actions on content
  – Ease of access to boards for reading and for posting
• Characteristics of board
  – Interactive interfaces for viewing in public places
  – Board size
  – Allow cycling of information
  – Offer overview of posted materials and retrieval
Design Guidelines

• Visual quality of content
  – Provide easily recognizable genres for different forms of content

• Actions on content
  – Allow annotations/comments
  – Readily taken away and shared
  – Material retrieval
  – Associate content with poster (author)
  – Provide grouping functionality

Plasma Posters

• Direct touch
• Portrait format
• Content
  – Posted by individuals via email or web
  – Automatically retrieved from selected intranet Web pages
Asynchronous use of large displays

Content Browsing

- Peripheral noticing
- (inter)active reading
- Active browsing and searching
- Messaging
Evaluation: Posted Content

- Low urgency
- People feel a presence within the community
- Plasma Posters provide complementary mechanism for content sharing

Evaluation: Interacting with Content

<table>
<thead>
<tr>
<th>Activity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>(inter)active reading</td>
<td>62.4%</td>
</tr>
<tr>
<td>Navigation and browsing</td>
<td>35.4%</td>
</tr>
<tr>
<td>Messaging</td>
<td>1.3%</td>
</tr>
<tr>
<td>Author look-up</td>
<td>0.9%</td>
</tr>
</tbody>
</table>
Evaluation: Interacting by Location and Time

<table>
<thead>
<tr>
<th>Location</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kitchen</td>
<td>67.9%</td>
</tr>
<tr>
<td>Hallway</td>
<td>19.8%</td>
</tr>
<tr>
<td>Foyer</td>
<td>12.3%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekdays</td>
<td>99%</td>
</tr>
<tr>
<td>Mornings &amp; coffee breaks</td>
<td>majority</td>
</tr>
</tbody>
</table>

Evaluation: Perceived Impact

- Reactions largely positive
- Promote informal communication
- Create a new genre of communication within the lab
Conclusion

• Large displays can be used asynchronously to support workgroup communication and work coordination by first identifying tasks and interactions that can be augmented.