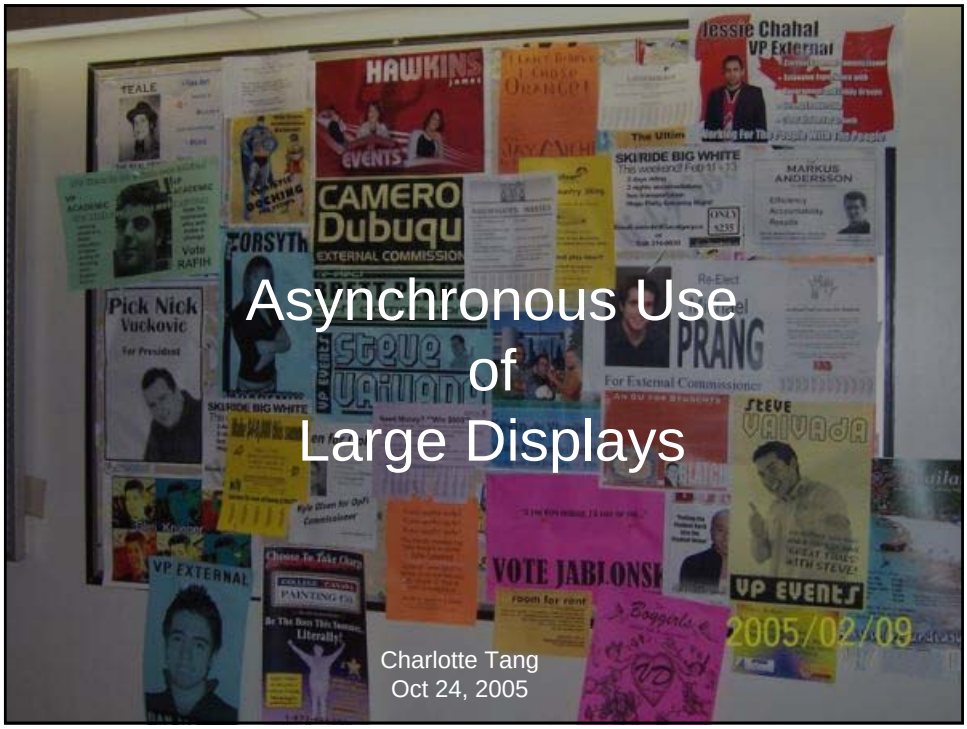

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Outline

- 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 Mynatt (1999)

- 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

Whiteboard use in offices

Observations

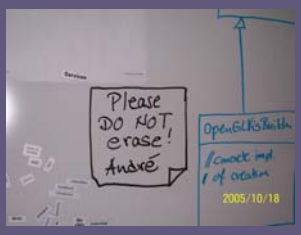
- Managing space
- Tasks
- Frequency of use
- Other issues

Whiteboard use in offices

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

Whiteboard use in offices

Frequency of Use

- Mostly bursty

Whiteboard use in offices

Other Issues

- Information Sharing
- Choice of Whiteboards

Whiteboard use in offices

Augmented Whiteboards

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

Whiteboard use in offices

Desired Features

- Retrieval by time and visual appearance
- Scrollable virtual space
- Connection with PC and PDAs

Whiteboard use in offices

Quick Highlights

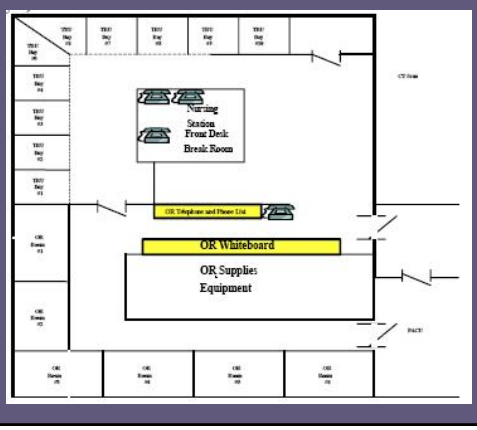
- Limited space in whiteboards
- Erased items cannot be retrieved
- Social relationship plays a role
- Contents are implicitly clustered
- Quick capture, reminders and pre-production tasks are typical

Whiteboard for Medical Use Xiao et al., 2001

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

Trauma Resuscitation Unit

Operating Rooms



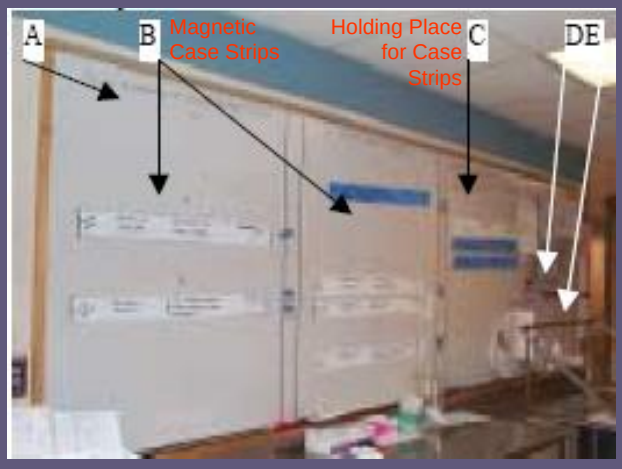
Whiteboard for medical use

Ethnographic study

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

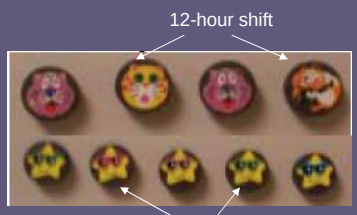
Whiteboard for medical use

The OR Whiteboard



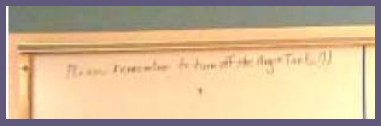
Whiteboard for medical use

Staffing Representation



Whiteboard for medical use

Messages and Notes



Whiteboard for medical use

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)

Whiteboard for medical use

Human-Board Cognitive System

- External representation of task status
- Physical manipulation of objects on the display

Whiteboard for medical use

Types of Interactions

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

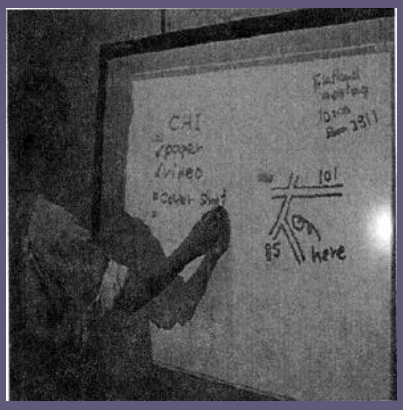
Whiteboard

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

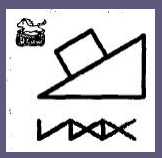
Flatland: Space Management

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

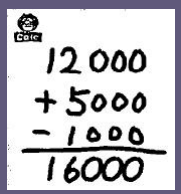
Flatland: Manipulation

- Freehand strokes with no pull-down menus, buttons, handles, …
- Behaviours help enhance visual quality and computation

To-do lists


2D drawing


Map drawing



Calculator

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

(Churchill et al., 2003)

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

Bulletin board in public spaces

Observations

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

Bulletin board in public spaces

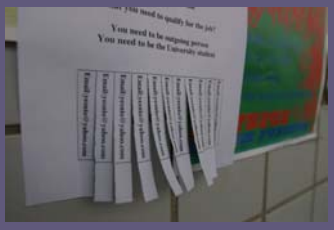
Location of Boards

- 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)

Bulletin board in public spaces

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



Bulletin board in public spaces

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

Information sharing in FXPAL

Observations

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

Information sharing in FXPAL

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

Bulletin Board

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

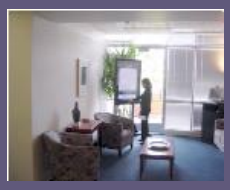
Bulletin Board

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



Plasma Poster

Plasma Poster

Content Browsing

- Peripheral noticing
- (inter)active reading
- Active browsing and searching
- Messaging

Plasma Poster

Evaluation: Posted Content

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

Plasma Poster

Evaluation: Interacting with Content

(inter)active reading	62.4%
Navigation and browsing	35.4%
Messaging	1.3%
Author look-up	0.9%

Plasma Poster

Evaluation: Interacting by Location and Time

Kitchen	67.9%
Hallway	19.8%
Foyer	12.3%

Weekdays	99%
Mornings & coffee breaks	majority

Plasma Poster

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.