Overview of CSCL Applications

Multi-display environments

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Structure

1. General overview of Multi-display environments (MDE)

2. Systematic presentation of MDE in CSCW → working setting

3. Analytical presentation of MDE in special case CSCL → learning setting

4. Discussion
General overview of MDEs

MDEs build a shared display space from variety of devices

- Tablets
  ![Tablet](ill. 3)
- Projected surfaces
  ![Projector](ill. 4)
- Tabletops
  ![Tabletop](ill. 5)
- Traditional monitors
  ![Monitor](ill. 6)
General overview of MDEs

- Problems of MDEs
- Intrinsic characteristic of different-sized displays
- Discontinuity inherent in MDE interaction
General overview of MDEs

• Problems of MDE interaction
  • Traditional interaction technique mostly needs a physical access
    - Laser beam & finger-pointing techniques
    - Providing a faithfull virtual of the actual display setting that can then be manipulated from a local device
    - Using the input-devices originally associated with one display to remotely control another
General overview of MDEs

- Challenge of design of multi-display systems

Providing a way to support direct manipulation of different physical surfaces with interaction techniques that offer a seamless control
General overview of MDEs

- Techniques for Multi-display Reaching
  - Pick and Drop
  - Corresponding Gestures

- Radar Views

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**Figure 2:** Corresponding Gestures. 1 - Starting point of the selecting gesture, 2 - end point of the selecting gesture, 3 - dropping gesture.

**Figure 5:** Radar. 1 - Pen touches the object, reduced representation (map) of the surrounding environment appears, 2 - user moves the pen to the representation of the target within the map and lifts the pen.
General overview of MDEs

- Techniques for Multi-display Reaching
  - Slingshot
  - Pantograph

Figure 3: Slingshot and Pantograph. 1-initial position of the pen, 2-current position of the pen, 3-destination of the object.
General overview of MDEs

- Techniques for Multi-display Reaching
  - Press-and-Flick
  - Perspective Cursor

Figure 4: Press-and-Flick. 1-Pen touches the surface (low pressure); 2-user increases the pressure; 3-user starts to move the pen - the distance is automatically fixed, the color of the circle changes and the line which indicates where the object will end up is displayed; 4-pen is released.

ill. 13

ill. 14
Systematic presentation of MDE in CSCW

- **CSCW** → Computer-Supported Collaborative Work
  - Archetyp of MDE: **Smart Office** → interconnected tablets
    - wall-mounted displays
    - laptops
    - projected surfaces
  
- **The Pod** (1993):
  - purpose-built room with a series of projected “information faces” surrounding a round table and accompanied by a technician’s workstation
Today: spaces (meeting rooms) for 6-10 people with:

- Several PCs
- Whiteboards
- SMARTBoardTM
- Big visual displays
- Telephone-videoconferencing facilities

information ecologies:
System of people, practices and technologies in a particular “local” environment
Advantages of MDE in CSCW

- Enriching the presentation of information
- Finding new ways of interaction with data
- Supporting new opportunities for collaboration
- Optimization of collaboration processes
- Improvement of identity, self-confidence, language, and tools & practices
• Examples of MDEs in CSCW
  
  • PARC's CoLab Project:
    - 'public windows' on personal workstations
    - Provides a large shared public space using lifeboard display
  
  • Roomware (i-Land):
    - Provides a set of artifacts to support individual and group work
  
  • iRoom:
    - Uses platform-independent approach which emphasizes the ability to easily create and add new displays and input devices
Analytical presentation of MDE in CSCL

- CSCL → computer-supported collaborative learning
- MDEs generate a new setting for communication, education and performance
  can support interactions between teachers and learners during small group activity in innovative and useful ways
Analytical presentation of MDE in CSCL

- Description of the Multi-display Learning Space
  - Six large screens on two adjacent walls
  - Oblique Orientation for a good view
  - Teacher can go around
  - Learners have enough space to make gestures
  - Learners can participate by means of laser
Analytical presentation of MDE in CSCL

• Examples of MDEs in CSCL
  • Classroom 2000:
    – Experiment to determine the impact of ubiquitous computing technology in education in an instrumented classroom
      → teacher writes on public display
      → teacher presents supplemental information in class via the World Wide Web
      → Using dynamic teaching aids such as videos, physical demonstrations or computer-based simulations

Combination provides for info-intensive experience
Learners comprehend more easily
Analytical presentation of MDE in CSCL

• Examples of MDEs in CSCL
  • Group Scribbles (2006):
    – Creating flexible shared arrangements of informations more easily
    – Moving between public and private spaces comfortably
    – Allows teacher to design, present and edit presentations of processes
    – Based on common physical artifacts of the classroom
Analytical presentation of MDE in CSCL

- **User-Interface of Group-Scribbles:**

ill. 22
Analytical presentation of MDE in CSCL

Pro & Contra of MDEs in CSCL

- Possibility to present a lot of material
- Learners can be better involved
- Material can be compared
- Experiences can be exchanged

- Learning situation is determined by the teacher
- Learning process is not creative
Do MDEs in CSCL support the learning process?

What do you think?
Sources


5. http://nihongono.typepad.com/.a/6a00d83452b27e69e201127940067228a4-800wi (retrived: 25.5.11)


Thank you very much for your attention!