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Private Workspaces in Single Display Groupware and Multiple Display Environments

Medieninformatik Hauptseminar
Sommersemester 2009
„Interactive Surfaces“



Outline

- 1 Motivation
- 2 Single Display Groupware (SDG)
- 3 Multiple Display Environments (MDE)
- 4 Further developments



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Motivation (1/2)

Interactive surfaces are used to support **collaborative work**:

- Share and exchange data across different platforms
- Jointly create and modify information on large displays

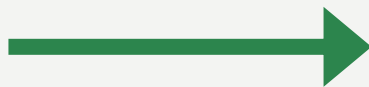


Figure 1: The iRoom environment

➔ Tradeoff between **successful group work** (intuitive & simple) and the **protection of private data**

Motivation (2/2)

Two approaches:



Multiple Display Environments (MDE)

Single Display Groupware (SDG)

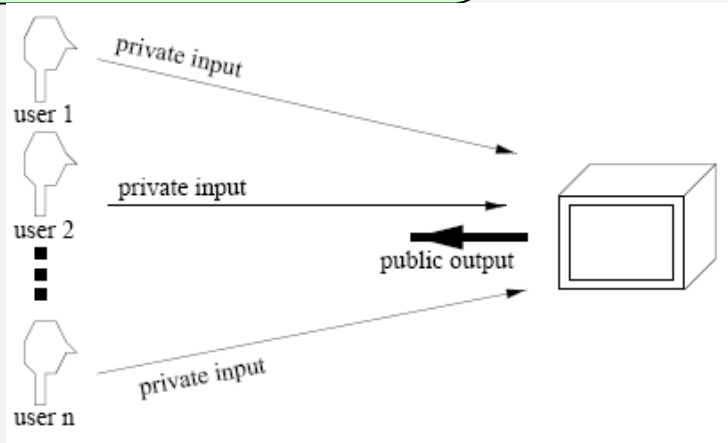


Figure 2: SDG

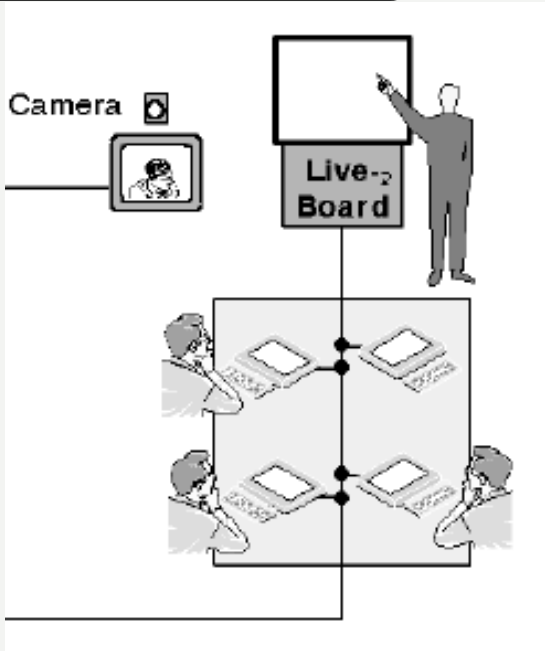


Figure 3: MDE



Outline

1 Motivation

2 Single Display Groupware (SDG)

- 2.1 Coordination policies
- 2.2 Personal areas
- 2.3 User profiles and carved regions
- 2.4 Limitations and problems

3 Multiple Display Environments (MDE)

4 Further developments

SDG (1/4): Coordination policies

Idea: define policies to clarify the rights of each participant on the available data

Graphical metaphors are used:

- Orientation, position and size of a document determines its privacy level
- Drag & drop → exchange data



Figure 4: The DiamondSpin tabletop surface



This approach relies on social protocols only!

SDG (2/4): Personal areas

Idea:

1. Define color-coded areas on the edge of a shared surface that belong to a specified participant.

➔ Documents are *personal*: Visible to all users, but only editable bei their owner

2. Connect an external device (PDA, laptop) via wireless LAN to establish a real private workspace

➔ Documents are *private*: invisible to other participants



Figure 5: Two users working with UbiTable

SDG (3/4): User profiles & carved regions

Media parcel
(data package
for a user)

Color-coded
cursor

Personal palette

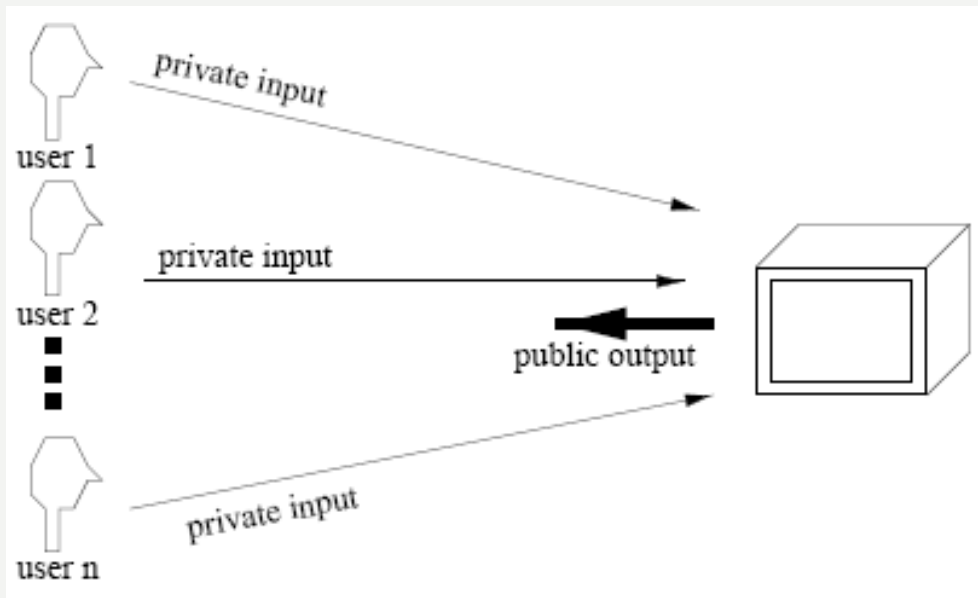


Carved
region with
two
participants

A color-coded
note

Figure 6: The Dynamo framework

SDG (4/4): Limitations & problems



- **Only one common output channel for all participants**
→ No possibility to establish real private areas on the shared surface
- Differentiation between *personal* and *private* areas

- **Real-estate problem:** disorientation and awareness overload
- **Graphical metaphors** have to be learned



Outline

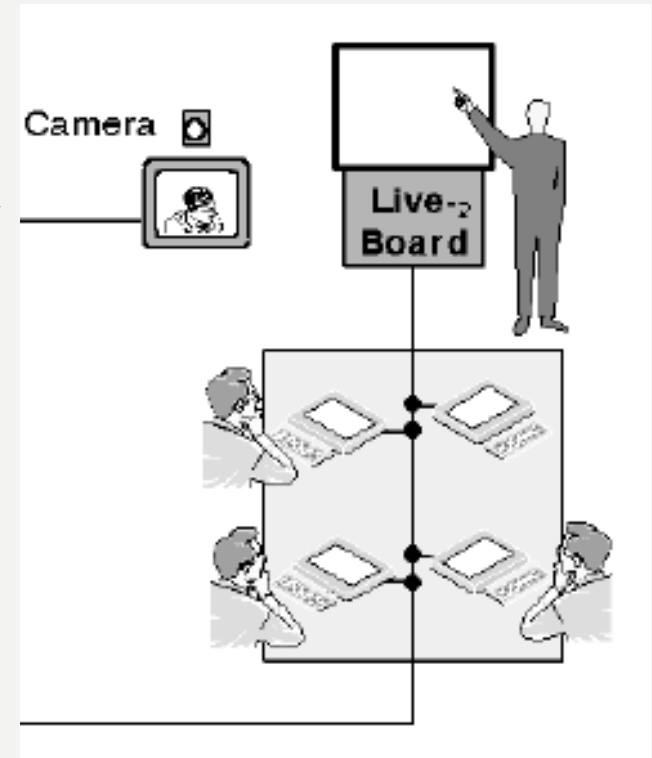
- 1 Motivation
- 2 Single Display Groupware (SDG)
- 3 Multiple Display Environments (MDE)
 - 3.1 Early approach: hypermedia models
 - 3.2 Screen sharing
 - 3.3 Application sharing
 - 3.4 Limitations and problems
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MDE (1/6): Overview

Solution:

environments are composed of a number of *public* interactive surfaces (wall displays, tabletops...) and personal devices (laptops, PDAs...)

- Intensified working with the personal devices (not only for data storage)



MDE (2/6): Early approach: hypermedia models

LiveBoard &
Connected PCs

The user interface (PC):

Public space: copy of the
LiveBoard contents

Private space:
WYSIWYG editor

Hypermedia nodes
(ASCII-Text, bitmaps,
scribbles) are
shared across
platforms



Figure 7: A meeting with the DOLPHIN MDE

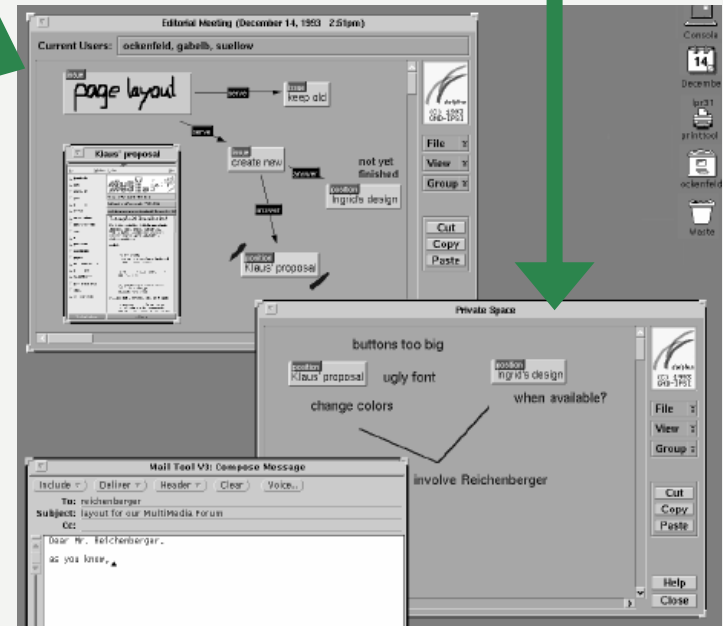
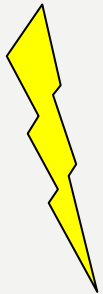


Figure 8: DOLPHIN's private workspace

MDE (3/6): Early approach: hypermedia models



- Heavily limited abilities to include different data types → **only predefined types of hypermedia objects** can be shared
- Users have to manage synchronization with and structure of the public display → **distraction of natural workflow!**
- Users are focused on their PCs → **group dynamics!**

MDE (4/6): Screen sharing

Idea:

Transmit the screen images of the personal devices one-to-one to one or more public shared surfaces.

- Users can control the privacy and visibility level of their screens
- Allows individual work (laptop) as well as effective group work (tabletop)
- Natural workflow: participants use their own workspace/applications
- **But:** not applicable for easy document exchange



Figure 9: The WeSpace MDE

MDE (5/6): Application sharing

Idea:

Share any off-the-shelf application on a public surface and enable multiple user input on it.

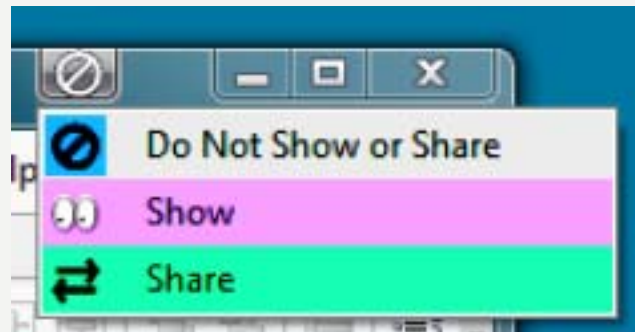


Figure 10: application sharing

MDE (6/6): Application sharing: INPROMPTU

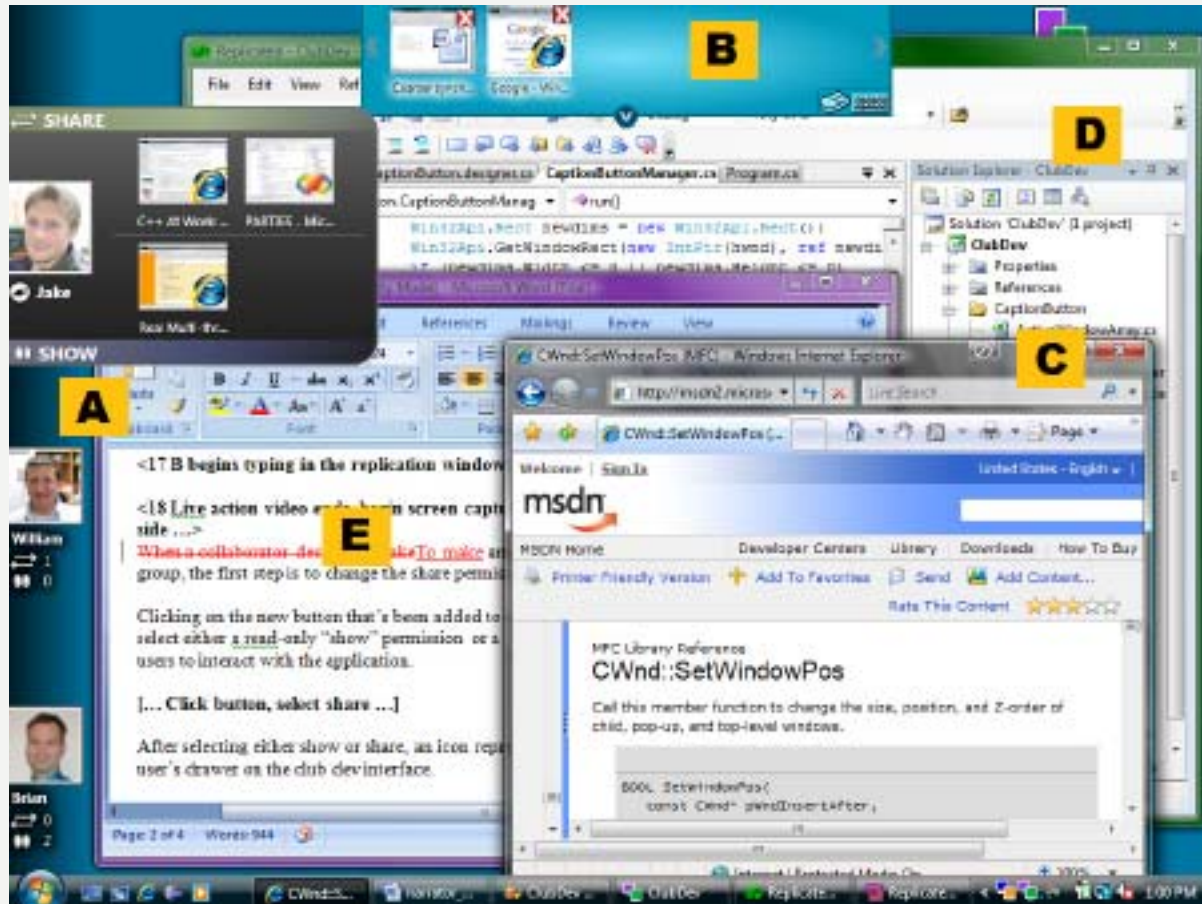


Figure 11: The INPROMPTU user interface



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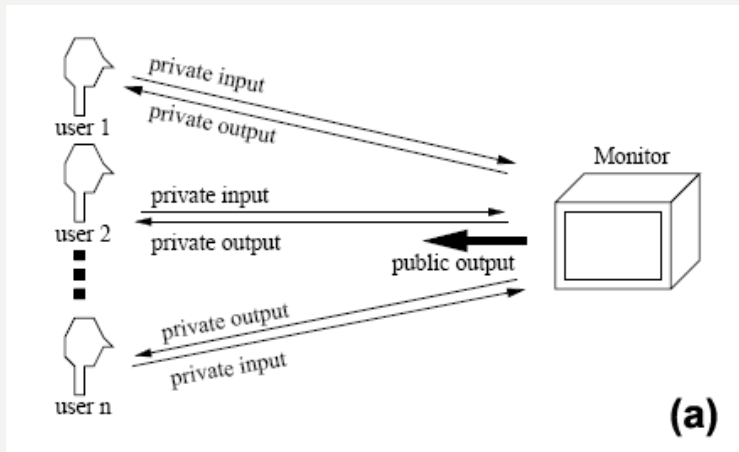
Further developments

Try to combine advantages of SDG (→ *natural group work*) and MDE (→ *privacy protection*): **Single Privacy Groupware**

Idea: provide a private output channel in SGD environments (CrystalEye glasses)



Individual view for each participant



Thank you for your attention.

...Questions?