


Using Informal Interfaces to Support Human-Human Communication

James A. Landay
March 19, 1998



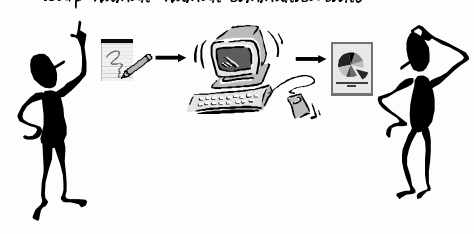
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Computers Support Human-Human Communication (HHC)




Traditional Software Interfaces

- ✓ Force translations to formal representations
 - * warp human-human communications



Traditional Representations

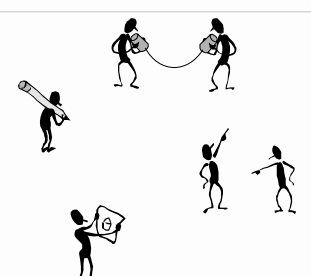
- ✓ Rigid and unambiguous
 - * hard to mix (e.g., few tools support rough sketches)
 - * warp perceptions of the viewer
- ✓ Increase time
 - * encourage precision
- ✓ Inhibit creativity
 - * "tunnel vision"



Informal Communications Styles


- ✓ Speaking
- ✓ Writing
- ✓ Gesturing
- ✓ Sketching

Informal UIs allow users to work naturally



Application Areas

- ✓ Architectural design
- ✓ UI design
- ✓ Informal presentations



Outline

- ✓ Informal user interfaces
- ✓ Sketching user interfaces
- ✓ Creating informal presentations
- ✓ Sharing informal notes


Interactive Sketching for Early Stage UI Design

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Early Stage UI Design


- ✓ Brainstorming
 - * put designs in a tangible form
 - * consider different ideas rapidly
- ✓ Incomplete designs
 - * do not need to cover all cases
 - * illustrate important examples
- ✓ Present several designs to client

Sketching of UIs



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Sketching of UIs

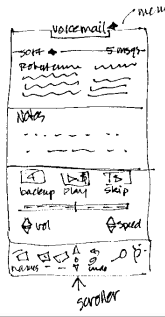


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Drawbacks of Current Tools

- ✓ Require specification of details
 - * give specific instance of a general idea
 - e.g., exact widgets, fonts, alignments, colors
 - * designers focus on unimportant details
 - * evaluators focus on wrong issues
- ✓ Take too much time to use
 - * poor support for iterative design

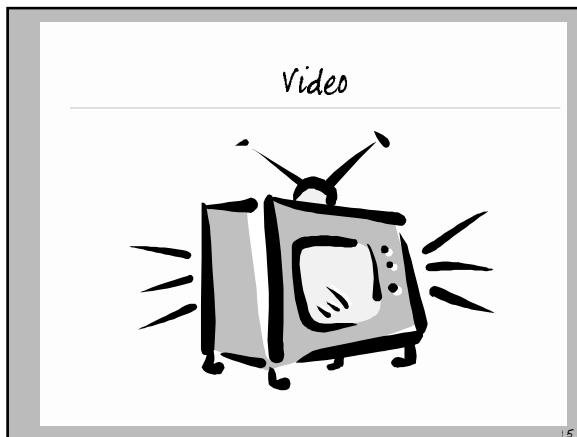
Paper Sketches



- ✓ Advantages:
 - * support brainstorming
 - * do not require specification of details
 - * designers feel comfortable sketching
- ✓ Drawbacks:
 - * do not evolve easily
 - * poor support for annotations
 - * force manual translation to computer
 - * do not allow end-user interaction

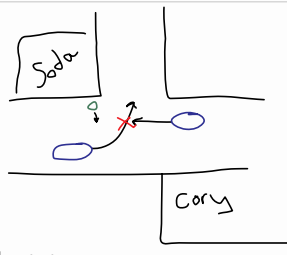
Designing UIs with SILK

- 1) Designer sketches ideas rapidly with electronic pad and pen
 - * SILK recognizes widgets
 - * easy editing with gestures
- 2) Designer or end-user tests UI
 - * widgets behave
 - * specify additional behavior visually
- 3) Semi-automatically transforms to a "finished" interface



Interactive Sketching for Informal Presentations

Informal Presentations



- ✓ Typical uses
 - * research group meetings, lectures, brainstorming...

Informal Presentations

- ✓ Characteristics
 - * very interactive
 - * early results that aren't "written in stone"
 - * less time to create
- ✓ Importance
 - * help people "bat" ideas around
- ✓ Opportunity
 - * apply our expertise in tools for early creative design

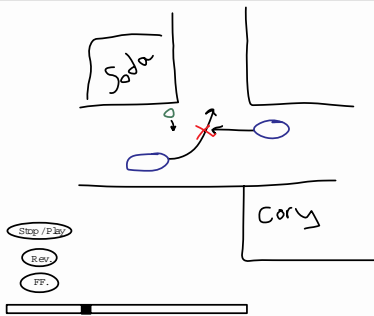
Problems with Existing Tools

- ✓ Colored pens on overheads
 - * miss the many advantages of computers
- ✓ Electronic presentation tools
 - * show wrong level of commitment to ideas
 - * slow for illustrating rough ideas
 - * hard to use dynamic capabilities of computers

Designing Informal Presentations on the Electronic Desk



Designing Informal Presentations on the Electronic Desk



We Are Building Informal Presentation Tools

- ✓ Quick sketching of slides & diagrams
- ✓ Easy creation of rough dynamic presentations
 - * use a sketched visual language
- ✓ Take advantage of two-handed manipulation
- ✓ Also support authoring of 3D presentations
 - * e.g., animations of chemical reactions for lectures
- ✓ Integrated with an existing presentation tool

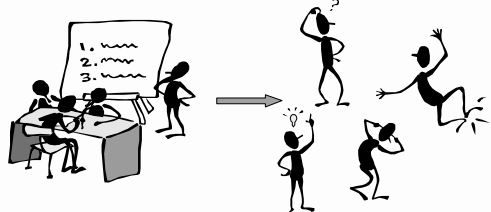
Questions We Will Answer

- ✓ What is an appropriate visual language?
 - * can you keep it simple, yet expressive? 2D & 3D?
- ✓ How important is recognizing sketched objs?
- ✓ How do you mix the formal & informal?
- ✓ What are appropriate table-based or whiteboard-based interactions?
- ✓ Must it be domain specific to be tractable?
- ✓ How effective are informal tools?

Interactive Shared Note Taking


Observation

We often leave meetings without a shared understanding about what occurred & what was important



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Vision



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Problem: How to Create a Meeting Record?

✓ Option A: Private individual notes




✓ Drawbacks

- * duplicated work
- * individuals may miss some points
- * miss others' perspectives

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Problem: How to Create a Meeting Record?

✓ Option B: Appointed scribe records




✓ Drawbacks

- * scribe may not have necessary background
- * scribe is overworked & can't participate
- * notes biased to scribe's point of view

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Problem: How to Create a Meeting Record?

✓ Option C: Computerized meeting room

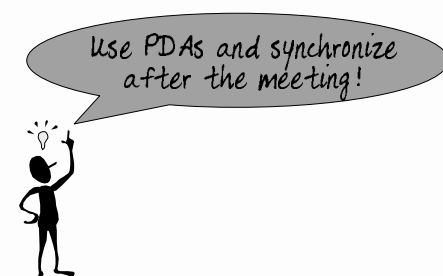


✓ Drawbacks

- * expensive
- * can't have meetings anywhere, anytime
- * computers may impede interaction

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"Crystallized" Vision



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How NotePals Works

Meet in any environment



①

Take free-form ink notes on Pilots*




②

*Pilots are becoming ubiquitous


How NotePals Works (cont.)

Dock Pilots with PCs & press "HotSync"



③

Browse notes on the Web



④

NotePals User Interface

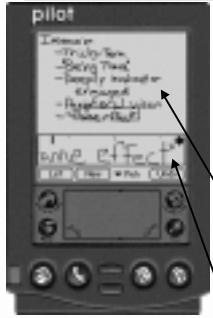
Got to remember to get a copy of this to Jordan Smith

Problem: Graffiti

- ✓ Notes are free-form ink
- ✓ Don't have to think about HW
- ✓ Single screen chunks w/o scrolling

▼ Action Item	<input checked="" type="checkbox"/> Private	ID
davis	10/17/97	
List	New	▼ Pen Undo

NotePals User Interface (cont)



context

focus

Problem: Size & Resolution

- ✓ Focus area lets users draw large text (2-3x)
- ✓ Context area shows entire page
- ✓ Move "cursor" with
 - gestures in Graffiti area
 - pointing/dragging in context area

NotePals User Interface (cont)


Got to remember to get a copy of this to Jordan Smith

Issue: Ink Hard to Search & Organize Later

- ✓ Notes can be given a stationery type
 - action item
 - new meeting
 - next meeting
 - note

▼ Action Item	<input checked="" type="checkbox"/> Private	ID
davis	10/17/97	
List	New	▼ Pen Undo

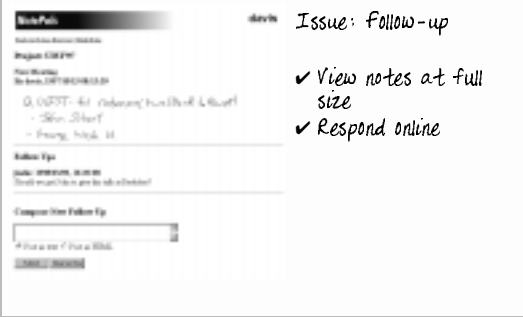
Web-based Note Repository



Problem: How to Share & Use Notes

- ✓ Merge all notes on web
- ✓ Sort/Filter notes by:
 - project
 - creator
 - date
 - stationery type

Web-based Note Repository (cont.)



Issue: Follow-up

- ✓ View notes at full size
- ✓ Respond online

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Advantages of our Approach

- ✓ Lightweight infrastructure
 - * no expensive hardware or special rooms
- ✓ Lightweight process
 - * supports any style of meeting
- ✓ Lightweight interface
 - * free-form ink lets users focus on meeting
- ✓ Lightweight sharing
 - * share load of record keeping
 - * not limited to a single perspective

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Current Work

- ✓ Better web organization & filtering
 - * offline HWR & graphical search
- ✓ More user testing and feedback
 - * how does sharing change note taking?
- ✓ May be more useful in other domains
 - * small group notes
 - * conference notes
 - * rough group brainstorming
 - * synchronization with presentation
 - slides or audio/video recording

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"Informal Interfaces Can Improve Human-Human Communication"



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