NiCEBook
Supporting Natural Note Taking

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Paper Notebooks

**Shortcomings**

1. searching
2. sharing
3. organizing
4. transferring
Digital Solution
Field Study
Apparatus

• 12 interviews
• Different professions

1. Semi-structured Interview
   30 min.

2. Contextual Interview
   30 min.

3. Artifact Analysis
Results

1. Quality of Paper
Results

2. Structuring Notes

- Symbols for marking
- Spanning pages
- Colors
- Topic/Date Categorization
- Demarcations
- Side-by-Side
Results

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Symbols for marking
Spanning pages
Colors
Topic/Date Categorization
Demarcations
Side-by-Side
# Results

## 3. Marking Notes

<table>
<thead>
<tr>
<th>Method</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Checkboxes</td>
<td>30%</td>
</tr>
<tr>
<td>Special Symbols</td>
<td>40%</td>
</tr>
<tr>
<td>Highlighter or colored ink</td>
<td>50%</td>
</tr>
<tr>
<td>Circling regions</td>
<td>60%</td>
</tr>
<tr>
<td>Numbering lists</td>
<td>70%</td>
</tr>
<tr>
<td>Highlight notes as specific items</td>
<td>100%</td>
</tr>
</tbody>
</table>
Results

3. Marking Notes

- Checkboxes
- Special Symbols
- Highlighter or colored ink
- Circling regions
- Numbering lists
- Highlight notes as specific items
Results

3. Marking Notes

- Checkboxes
- Special Symbols
- Highlighter or colored ink
- Circling regions
- Numbering lists
- Highlight notes as specific items
Results

4. Re-using Notes
   - Transfer to digital applications (92%)
Results

5. Sharing Notes

- Copy pages (25%)
- Share notebook
- Extract pages
Related Work
Note Taking Studies

The Myth of the Paperless Office
(Sellen and Harper, 2003)

A Survey of Note-Taking Practices
(Khan, HP Labs Technical Report, 1993)
Digital Notes

InkSeine
(Microsoft Research)

OneNote
(Microsoft Office)
Tagging

Digital Paper Bookmarks
(Steimle, 2008)

PapierCraft
(Liao, 2008)
Quality & flexibility of writing on paper + Digital notebook
NiCEBook

- Note taking on paper
- Support for structuring notes
- Allows sharing notes
NiCEBook

- Anoto digital pen & paper technology
Taking Notes

Simply writing on paper
sync
Page Overview

Spread view of all pages

Zoom view
Structuring Notes

- Categories on each page
- For the most frequently used tags
Categories

- Which categories should we provide?
  - Online survey (232 students, 44 professionals)
categories
Categories

- Technical Setup
  - Paper → BT Streaming → PC
  - Finished: 15.07.09
  - Two weeks before tech meeting
  - Steve: 555-7789

- Statistics 2009
  - Request Details
Categories

Tagged areas can be visibly marked
Structuring Notes

- Topics on extendable sidebar
- Topics are user-defined
Topics

• How many topics should we provide?
topics
Topics

- Overwrite a topic
Dog-Ears

- Tagging a whole page
- Haptic feedback for searching
dog-ears
Searching Notes

search
Sharing Notes

export
Evaluation
Comparison of techniques for tagging notes

ioTags (Logitech)

NiCEBook
Monday 16:30-18:00
Papers / Hanover CDE
ToDo: Prepare Slides!!
NiCEBook

1. Tag

2. Selection

Point 1

Technical Setup

Point 2

Finished: 15/07/09

two weeks before tech meeting
Steve: 555-7794
Experiment

- 12 participants from local university
- 6 successive note-taking tasks
Experiment

- Error rate analysis

- Criteria:
  1. User selects correct tag
  2. Software recognizes correct tag
  3. User selects correct region
Results

Software recognizes correct tag

NiCEBook
5.0 out of 6 tags (SD=1.41)

ioTags
4.0 out of 6 tags (SD=1.21)

t(11)=2.10, p <0.05
Results

User selects correct region

NiCEBook
4.17 out of 6 notes (SD=2.29)

ioTags
2.42 out of 6 notes (SD=1.62)

\[ t(11)=2.47, \ p<0.05 \]
NiCEBook vs. ioTags

NiCEBook

ioTags
Conclusion

- NiCEBook design generally validated
- Error-rates still too high
  - more feedback from pen
- Extended interface for sharing notes
  - integration into legacy software
Questions?

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