

Paper Flight Strips in ATC

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Goals

- ◆ Question: Is it possible to avoid the use of paper strips in ATC?
- ◆ Suggested solutions:
 1. Yes, if controllers become supervisors but not decision makers
 2. Yes, if the functions of paper are fully transferred to digital media
 3. No. The system works; don't fix it.

Previous Work

Could be divided into two groups thus:

1. Studies that propose eliminating paper by building new digital systems that:
 - a) Emphasize on coordinative functions of flight strips
 - b) Emphasize on visual design of strips (e.g. animations)
 - c) Use PDAs instead of flight strips
 - d) Use of touch-screens to replace flight strips
2. Studies that propose keeping the current system, and just augmenting it.
 - a) Use of augmented paper strips
 - b) Proposing more research into the issue

Previous Work: Limitations

1. Coordinative function paper:
 - No user study done
 - Does not propose solutions
2. Visual design paper
 - Does not solve problem in question
3. Use of PDAs
 - Does not support annotations
4. Use of augmented paper strips
 - Solution proposed, but details avoided

Project Description

- ◆ Ethnographic study on Air Traffic Controller
 - ◆ How they interact with the flight strips
 - ◆ How this interaction fits into the whole picture
- ◆ Approach:
 - ◆ Interview the controllers
 - ◆ Use questionnaires
 - ◆ Observe and record control tower operations
 - ◆ Written notes
 - ◆ Audio and video records
 - ◆ Take pictures

Importance of Project

- ◆ Advocates for use of augmented flight strips
 - Human factors safe
 - Retain current affordance of paper strip
 - Propose a workable (that can be implemented) solution based on the feedback received and technologies on mixed interfaces

References

- ◆ The Coordinative Functions of Flight Strips: Air Traffic Control Work Revisited
Johan Berndtsson, Linne Group, Maria Normark, Royal Institute of Technology, Sweden
- ◆ An Interactive Electronic Flight Progress Strip Prototype
Nathan A. Doble, R. John Hansman, August 2002
- ◆ Is Paper Safer? The Role of Paper Flight Strips in Air Traffic Control
Wendy E. Mackay, University of Aarhus
- ◆ Visual re-representation of database information: the flight data strip in air traffic control
Shapiro, Dan Z.; John A. Hughes; David W. Randall; And Richard H. R. Harper
- ◆ Reinventing the Familiar: Exploring an Augmented Reality Design Space for Air Traffic Control
Wendy E. Mackay, Anne-Laure Fayard, Laurent Frobert and Lionel Médini Centre d'Études de la Navigation Aérienne
- ◆ An Augmented Stripboard for Air Traffic Control
Lionel Médini, Wendy E. Mackay