





## Two Popular Models for Iterative Usability Programs

- Exploratory usability testing with two to four participants after each of several iterative development cycles
- Heuristic evaluation, followed by design revisions, followed by usability testing



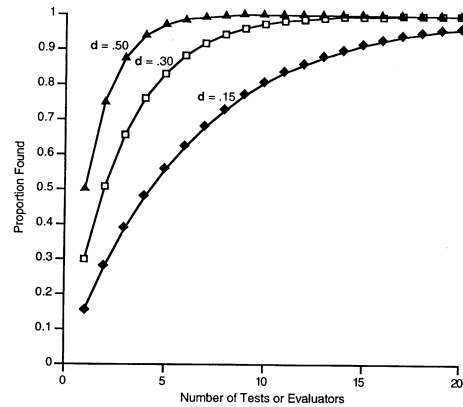
## Research Shows Success of Iterative Exploratory Testing

- 8 cycles of testing with 1 or 2 participants increased user accuracy by 20%
- Maximum benefit-cost ratio for user testing comes from 3 - 5 participants
- 80% of problems detected with 4 or 5 participants
- Serious flaws tend to show up earlier

(Nielsen, 1989; Nielsen and Landauer, 1993; Virzi, 1992)



## Finding Usability Problems



(Landauer, 1995)



## Heuristic Evaluation, then Usability Testing Cost-Effective

- Web site HE (using static screens) found problems in screen layout, terminology
- Usability testing after redesign confirmed HE findings and identified additional problems with UI behavior

(Kantner and Rosenbaum, 1997)



## **But These Usability Programs Have Risks**

- May not evaluate different audiences
- Don't observe users in their context of work
- Don't address longitudinal issues



## **Instead, Choose Different Methods Depending on:**

- Where you are in the product development cycle
- What questions you want to answer
- Which audiences you want to study
- Which usage scenarios are of special interest, for what reasons



## **Current Model Looks Like This:**

- Design and prototype product A
- Laboratory-test product A — prototype
- Revise the prototype
- Laboratory-test product A — prototype 2
- Develop the alpha version
- Laboratory-test product A — alpha
- Develop the beta version
- Laboratory-test product A — beta
- Revise and release product A
- Design and prototype product B (and so forth)



## **If UCD Were Integrated with Product Development, Model Would Begin:**

- Conduct ethnographic field studies of target users
- Perform task analysis of target users



## **Realistic Recommended Model**

- Contextual inquiry of predecessor product A
- Design and prototype product B
- Exploratory usability test of product B
- Revise the prototype
- Task-based usability focus group of revised prototype
- Develop the alpha version of product B
- Usability test the alpha version
- Develop the beta version of product B



## **Realistic Recommended Model (cont.)**

- Ethnographic interviews with product B beta customers
- Minor changes to product B based on ethnographic interviews
- Release product B
- Contextual inquiry of product B to inform design of product C prototype



## What's Different about the Recommended Model

- Includes field studies throughout the design process, alternating with “lab” usability tests
- Can include highly qualitative and group methods such as focus groups
- Continues after product release to inform future releases



## Why Include Contextual Inquiries

- Rich data from seeing users in actual work situations
- Users become partners in the inquiry through ongoing dialog
- May identify usability issues not previously recognized, including continued-use issues
- Avoid misleading situations from placing users in artificial situations
- Ongoing not summary experience; concrete data not abstract information



## Concerns About Contextual Inquiries

- Risk of selecting atypical users to observe
- Hard to gather statistically meaningful data from different user situations
- Time and budget constraints often limit site visits
- Usually no videotaping so can't "show" colleagues what happened
- Highly dependent on skills of inquirer



## Contextual Inquiry Case History

- Sun's Service Order Tool is main component of a highly complex enterprise-wide call management system
- Used daily by hundreds of people around the world
- Critical support for customer-service, account management, and field-service tasks
- CI with 24 users in U.S. (East and West coasts), England, France, and Germany
- Studied how well the tool supports Sun's business processes and the tool's eight distinct user groups
- Study resulted in reducing complexity of tool



## Why Include Site-Based Ethnographic Interviews

- Observe work environment (physical and cultural)
- Learn user characteristics related to the target job and audiences
- Yield descriptive information about how tasks are performed and task priorities
- Can be probed to desired level of detail
- Can clarify specific interviewer misunderstandings, confusions
- Series of interviews can provide longitudinal data



## Concerns about Ethnographic Interviews

- Interviewees' selective memory biases
- Interviewees' reconstruction of responses
- Most valid results obtained with trained interviewer
- Can misinterpret data without benefit of behavioral observations



## Case History of Ethnographic Interviews

- MDs and hospital staff during alpha test of clinical information system
- Weekly interviews during six-week alpha test period
- Interviews ended with coaching in system use
- Medical environment demanding, requires patience



## Why Include Usability Focus Groups

- Produce rich, qualitative, real-life ideas and opinions in a social environment
- Can address new product plans or existing products
- Participants are strangers with similar backgrounds
- Collect data, not reach agreement
- Actual user tasks performed by small groups
- No individual performance data collected



## Concerns about Usability Focus Groups

- Little quantitative data produced, so data can be difficult to analyze
- Differences between groups can pose analysis problems
- Groups can be hard to assemble
- Quality of results depend heavily on moderator's skills



## Focus Group Case History

- Learned how people currently search on the Web
- Showed three alternative UI designs
- Discussed advantages and disadvantages of each
- Collected feedback on specific features
- Collected preferences from group members



## **Why the Mixed-Method Model Isn't Frequently Used**

- It hasn't been described often enough in the literature
- Many usability practitioners aren't trained in experimental design, so they tend to use successful study designs over and over, even when others would produce better results



## **Case Histories of the Mixed-Method Model**

- Thomas Publishing Company's Product News Network
- Philips Medical Systems' MIRACLE
- Latitude Communications' MeetingPlace



## **Many Cycles of Product News Network Evaluation**

- Heuristic evaluation of early, static prototype
- Usability test of revised, interactive, minimal-data prototype
- Usability walkthrough of alpha product (static screens)
- Log analysis of beta product with online survey
- Usability test of released product where users defined their own searches

(Kantner and Rusinsky, 1998)



## **Clinical Information System Usability Program during Alpha Test**

- Informal heuristic evaluation
- Initial “out-of-box” usability testing
- Weekly ethnographic interviews
- Review of audiotaped diaries
- Review of automated system usage logs
- Second usability test of complex tasks and less-used features

(Rosenbaum, Hinderer, and Scarborough, 1999)

# TE Teleconferencing System Usability Informed Document Design

- Usability test of new VUI and GUI identified many problems
- Writer participated in usability testing
- Quick-Start booklet and online Quick Tour addressed problems development couldn't fix immediately
- Continued-use interviews identified longer-term issues, collected data from different audiences

(Kantner, Rosenbaum, and Leas, 1997)

## Inviting People to the Meeting at Your Computer

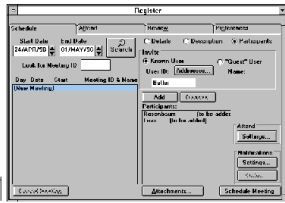
**Why specify participants?**

By specifying who is to attend a meeting, you make it possible to:

- Send meeting announcements, agendas, and materials to participants
- Allow participants to get a list, by phone, of the meetings to which they've been invited
- Change participants' preferences for how they are to be notified about the meeting (e-mail or fax) and/or how they want to attend (for example, call in or be called or paged by MeetingPlace)
- Restrict participants to only those you invite

**How to invite people from your company**


On the Schedule tab, click the Participants button to access the Participants pane. Then type the user ID and click the Add button. (If you don't know the user ID, click the Address button to get a search tool.)



**How to invite guests**

To invite people from outside your company, click the Guest User button. Then type the guest's name in the Name box and click the Add button.

If the guest wants to be called to the meeting by MeetingPlace, click the Attend Settings button. In the Attend Settings window, change the guest's Attending By setting to "Have system call user." Then click on the guest's Phone Number item and type the phone number in the input box.



**Overriding attendance and notification preferences**

You can use the Attend Settings window to change a user's attendance preferences *for this meeting only*. For example, if you want to page a user who normally calls in, you change the Attending By entry from "User calls in" to "Have system page user."

The Notifications Settings button opens a window similar to the Attend Settings window that allows you to override a user's notifications preferences *for this meeting only*. For example, if you want to notify a user by fax instead of e-mail, you change the 1st Method entry from E-Mail to Fax.



## Discussion Topics

- How does your group decide where in the development cycle to invest in usability studies?
- What problems have you encountered trying to establish an iterative usability program?
- What iterative usability activities have been successful, and why?
- What benefits—and what challenges—have you experienced in field usability studies?



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