CHAPTER 5:
Evaluation and the User Experience

Designing the User Interface:
Strategies for Effective Human-Computer Interaction

Sixth Edition

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Survey Instruments

- Written user surveys are a familiar, inexpensive and generally acceptable companion for usability tests and expert reviews

- Keys to successful surveys
  - Clear goals in advance
  - Development of focused items that help attain the goals

- Users could be asked for their subjective impressions about specific aspects of the interface such as the representation of: task domain objects and actions
  - Syntax of inputs and design of displays

Examples of the specific satisfaction scale questions:					
5.4	Messages which appear on display:	confusing	clear	1 2 3 4 5 6 7 8 9	NA
5.4.1	Instructions for commands or choice:	confusing	clear	1 2 3 4 5 6 7 8 9	NA

Survey Instruments (continued)

- Other goals would be to ascertain:
  - User background (age, gender, origins, education, income)
  - Experience with computers (specific applications or software packages, length of time, depth of knowledge)
  - Job responsibilities (decision-making influence, managerial roles, motivation)
  - Personality style (introvert or extrovert, risk taking or risk aversive, early or late adopter, systematic or opportunistic)
  - Reasons for not using an interface (inadequate services, too complex, too slow)
  - Familiarity with features (printing, macros, shortcuts, tutorials)
  - Feeling state after using an interface (confused or clear, frustrated or in-control, bored or excited)

Survey Instruments (concluded)

- Online surveys avoid the cost of printing and the extra effort needed for distribution and collection of paper forms
- Many people prefer to answer a brief survey displayed on a screen, instead of filling in and returning a printed form
  - although there is a potential bias in the sample
- A survey example is the Questionnaire for User Interaction Satisfaction (QUIS)
  - http://lap.umd.edu/quis/
- There are others, e.g. Mobile Phone Usability Questionnaire (MPUQ)

Acceptance Test

- For large implementation projects, the customer or manager usually sets objective and measurable goals for hardware and software performance
- If the completed product fails to meet these acceptance criteria, the system must be reworked until success is demonstrated
- Rather than the vague and misleading criterion of "user friendly," measurable criteria for the user interface can be established for the following:
  - Time to learn specific functions
  - Speed of task performance
  - Rate of errors by users
  - Human retention of commands over time
  - Subjective user satisfaction

Acceptance Test (concluded)

- In a large system, there may be 8 or 10 such tests to carry out on different components of the interface and with different user communities
- Once acceptance testing has been successful, there may be a period of field testing before national or international distribution

Evaluation During Active Use and Beyond

- Successful active use requires constant attention from dedicated managers, user-services personnel, and maintenance staff
- Perfection is not attainable, but percentage improvements are possible
- Interviews and focus group discussions
  - Interviews with individual users can be productive because the interviewer can pursue specific issues of concern
  - Group discussions are valuable to ascertain the universality of comments

Evaluation During Active Use and Beyond (continued)

- Continuous user-performance data logging
  - The software architecture should make it easy for system managers to collect data about:
    - The patterns of system usage
    - Speed of user performance
    - Rate of errors
    - Frequency of request for online assistance
  - A major benefit is guidance to system maintainers in optimizing performance and reducing costs for all participants

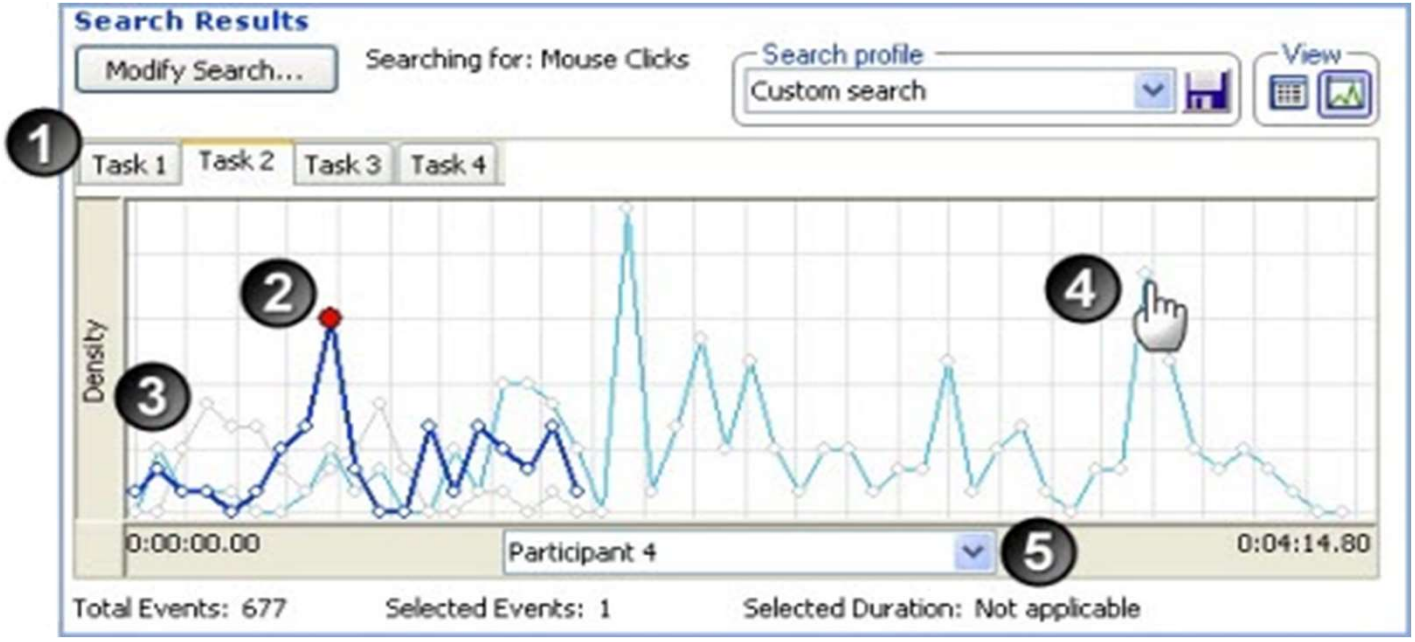
- Online or chat consultants, e-mail, and online suggestion boxes
  - Many users feel reassured if they know there is a human assistance available
  - On some network systems, the consultants can monitor the user's computer and see the same displays that the user sees

Evaluation During Active Use and Beyond (continued)

- Online suggestion box or e-mail trouble reporting
  - Electronic mail to the maintainers or designers
  - For some users, writing a letter may be seen as requiring too much effort
- Discussion groups, wikis and newsgroups
  - Permit postings of open messages and questions
  - Some are independent, e.g. America Online and Yahoo!
  - Topic list
  - Sometimes moderators
  - Social systems
  - Comments and suggestions should be encouraged

Evaluation During Active Use and Beyond (concluded)

- Example output of an automated evaluation tool from TechSmith's Morae
  - The item being measured is mouse clicks.
  - This shows the view for task 2 (selected in the tabbed bar). Obviously, the other 3 tasks could also be displayed. These are the values for participant 4.
  - The drop down list box would allow the evaluator to choose the mouse clicks for other participants.
  - Across the horizontal axis time is shown



Controlled Psychologically-oriented Experiments

- Scientific and engineering progress is often stimulated by improved techniques for precise measurement
- Rapid progress in the designs of interfaces will be stimulated as researchers and practitioners evolve suitable human-performance measures and techniques

Controlled Psychologically-oriented Experiments (continued)

- The outline of the scientific method as applied to human-computer interaction might comprise these tasks:
  - Deal with a practical problem and consider the theoretical framework
  - State a lucid and testable hypothesis
  - Identify a small number of independent variables that are to be manipulated
  - Carefully choose the dependent variables that will be measured
  - Judiciously select subjects and carefully or randomly assign subjects to groups
  - Control for biasing factors (non-representative sample of subjects or selection of tasks, inconsistent testing procedures)
  - Apply statistical methods to data analysis
  - Resolve the practical problem, refine the theory, and give advice to future researchers

Controlled Psychologically-oriented Experiments (concluded)

- Controlled experiments can help fine-tuning the human-computer interface of actively used systems
- Performance could be compared with the control group
- Dependent measures could include performance times, user-subjective satisfaction, error rates, and user retention over time