Lecture 9: Expert-based Evaluation

Usability evaluation

- Reasons:
  - Save costs
  - Avoid major events from being altered
  - Avoid users' rejection
  - Lives at risk
  - Use of technology appropriately
- Definition: comparison of a system against a criterion
  - Evaluating of system (not artefact)
- Influenced by
  - Surface features (appearance, layout, naming)
  - Deeper features (functionality, knowledge, specificity, extensibility)
  - Support systems (instructional information and manuals)
  - Contextual variables (product compatibility, marketing, construction and packaging, safety/protection during use)
- Where
  - Natural settings
  - Laboratory settings
- When
  - Throughout design
  - Finished products
- Objectives
  - Establish requirements
  - Establish effective use
  - Identify interface improvements
  - Compare designs
- Types of evaluation
  - Formative usability testing
    - Goal: improve ease of learning
    - Paper prototype & scenario
    - Lab-based evaluation
  - Summative field study
    - Goals: assess effectiveness
    - App prototype
    - Field study

Evaluation methods and techniques

- User involvement
  - Subject/User based
    - Lab observations (experiments)
    - User reports (surveys)
    - Field observations
  - Usage based
    - Market surveys (market performance)
    - Activity logs (behaviour patterns)

	Controlled settings (Usability tests, experiments)	**Natural settings** (field studies)	**Expert-based** (heuristic eval., cognitive walkthr.)
Users	Do task	Natural activities	Not involved
Location	Controlled	Natural	Anywhere
When	Prototype	Early	(Early) prototype
Data	Quantitative	Qualitative	Problems
Feedback	Measures and errors	Descriptions	Problems
Strengths	Control, reveal problems	naturalistic	Cheap and quick to conduct
Weaknesses	Artificial setup	Time-consuming, complex	May miss or exaggerate issues

- Non-user evaluation
  - Expert-based
    - Inspection methods/Analytic methods
      - Reviews: formal, informal
        - Present sketches and gathering feedback, reflect and re-evaluate ideas
        - Elevator pitch (informal): quick reactions at any moment
        - Desktop review
        - Meeting (formal)
        - Formal review (design critic)
      - Heuristic evaluation: review guided by a set of heuristics
        - Advantages: fast, inexpensive, can be used early, limited users, applicable for paper prototypes and working systems, specific heuristics exist for particular systems, good if lack time and labs
        - Disadvantages: requires expertise, needs minimum of 3 experts for good coverage, does not involve representative end-users, tendency to exaggerate number and severity of problems, uncertain applicability, principles at motherhood level
        - Nielsen Heuristics (10): Visibility, Match, Control, Consistency, Prevention, Recognition, Flexibility, Minimalism, Recover, Help
      - Cognitive walkthrough: stepping through a pre-planned scenario noting potential problems
  - Theory-based
    - Comparison to theoretical model (eg. GOMS, KLM)
  - When

        - Users not easily accessible or limited or expensive or takes too long
        - Still developing design ideas
    - How many:
        - Depends on resources, goal of evaluation (formative evaluations/summative evaluations)
        - Prior experience and similar studies

Lecture 10: Cognitive Walkthrough

Definition

- Focus: ease of learning for novel users of a product, identifies usability problems
- Conducted by: non-users (experts or members of design team)
- Based on: tasks and scenarios (tasks correspond to realistic situations and segmented into sequence of steps)
- Use early prototype of specifications of design (interface can be at various levels of maturity)
- Evaluators roleplay a user working with the system – stimulate problem solving process at each step of a task, adopt users' perspective in interactions and achieving goals
- Evaluators ask specific questions at every step of task (identify convoluted ,circuitous paths through function sequences)
- Purpose: identify missing feedback/instructions/functions/icons
- Can be done in groups (known tasks, actions and expected responses)
- Typically conducted before user-based studies (avoid waste of time and resources)

Process

1) Identify characteristics of typical users
    a) Problem situation
2) Write activity scenarios and tasks
    a) Describes new system in use
    b) Identify both simple and complex tasks
    c) Use realistic tasks with the system
    d) Balance complexity of tasks with range of functionality
    e) Choose tasks that cover multiple core functions
3) Develop prototype
4) Establish clear sequence of actions for tasks
    a) Choose a 'happy path' (actions to achieve their goal)
5) Review walkthrough checklist questions
    a) Will user know what to do?
    b) Will user see how to do it?
    c) Will user understand from feedback whether action was correct or not?
6) Select evaluators
    a) Team members
    b) Plan location and time for evaluator to assess system
    c) Prepare materials for evaluators to familiarise with purpose of system and users
    d) Design note-taking strategy
7) Evaluate