Quality usability problem reporting and documentation is key to return on investment in usability testing.

- Currently: Ad hoc usability problem reporting
- Evaluators write down what they believe salient based on what they notice, what are they thinking at the time
- Laundry list of raw usability problems
- Inconsistent quality, vague, incomplete descriptions

- Usually can’t fix all the problems
- Need: Good diagnosis to fix the right problem
- Fixing wrong problem can create more problems
- Failure to fix right problem: missed opportunity (that you paid for)
Usability Problem Analysis

- Formative evaluation – identify critical incidents = raw usability data
- Must be analyzed:
  - Problem extraction – isolate individual usability problems
  - Identify effects on user (the real usability problem)
  - Diagnosis each usability problem in terms of
    - Problem type and subtype
    - Causes within interaction design
  - Diagnoses by type and cause is done by classifying the problem within the User Action Framework (locating it in the space of interaction design issues)

What the Whole Process Looks Like to the Usability Engineer

The Importance of Usability Problem Analysis

- Usability problems can seem the same on surface but have different underlying causes
- Cost-effective solutions depend on:
  - Correctly identifying problem and cause
  - Accurate problem descriptions in reports
The Importance of Usability
Problem Analysis

- Diagnosis within UAF aids problem description and reporting in two ways:
  - Precision
  - Completeness
- Diagnosis within UAF puts usability problem in context of applicable usability principles and guidelines
  - Specificity of problem description often yields self-suggesting solution (e.g., label font too small)

The Importance of Usability
Problem Analysis

- How does diagnosis aid description of problem type and cause?
  - Each decision point (UAF node) in structure is about a different pre-defined usability attribute
  - Decision path represents set of usability attributes (coordinates within usability problem/design space)
  - Decision path
    - = ‘encoding’ of problem description
    - = basis for problem diagnosis in report

The Importance of Usability
Problem Analysis

- Example
  - Observed (effect on user): User doing word processing cannot set margins
  - Diagnosis (cause = flaw in interaction design): Interaction design fails to provide sufficient clarity of meaning in cognitive affordances (e.g., in ‘ruler’ so <new user> is unable to determine correct action plan for current intention <set margins> in current task <format page>
The Importance of Usability
Problem Analysis

- It is known that diagnosis is difficult to learn
- VT Vet School had trouble with clinical diagnosis course
  - Determined need for structure and guidance
  - To head off jumping to conclusions without following a logical process of building the case
  - We have same problems with new practitioners diagnosing usability problems
- Miranda Capra is working to build and evaluate a system for usability problem diagnosis based of these ideas

Why jumping to conclusions does not work with diagnosis using UAF
- UAF is organized on Interaction Cycle, sequence of different kinds of user actions
- UAF is not organized as a taxonomy of usability concepts
- Thus, high-level concepts (e.g., consistency) are distributed
- Thus, there might be more than one node that appears to match
- Diagnosis must match an entire classification path

Jon Howarth is working on semantic analysis of UAF content to improve diagnosis
- To maximize distinguishing power of UAF nodes for diagnosis decision making
  - Greatest semantic distance among siblings
- To maximize parent-sibling affinity/similarity but retain hierarchical relationship
Usability Problem Analysis

• Key point for usability problem diagnosis
  - It’s about how design fails to support user, not about how user fails to cope with the design
  - Example, if a user tries to do something the system can’t do, it is not poor planning on the part of the user for planning to use a feature that didn’t exist

Usability Problem Analysis

• Next, some in-class exercises to diagnose usability problems