Software Process

- What is it?
  - Inputs ⟷ Process ⟷ Outputs
- Many different software processes are necessary during software development.
  - Analysis processes
  - Construction processes
- Why care?
  - Try to improve outputs by improving process.
- Levels of software process:
  - ad hoc
    - Inputs ⟷ (do what you think is best) ⟷ Outputs
  - systematic
    - Inputs ⟷ Step 1 ⟷ Step 2 ⟷ ... ⟷ Outputs
  - and many levels in between...
But to reason about software process we need to worry about Process Conformance
- Do the outputs really result from the procedure we think produced them?
- If I ask for systematic am I really getting ad hoc?

Ways of handling process conformance:
- self-reporting
- intermediate artifacts
- post-tests
- observation

Must be careful that assessing process conformance does not interfere with the process itself!

Observational Studies of Software Process
- “an experimental subject performs some task while the experimenter gathers data about what exactly the subject does”
- Distinguished from retrospective studies, in which data collection is done after the fact
  → E.g. questionnaires, post-mortem discussion
  → problems with accuracy
- Observational data may be:
  → inquisitive - responses are solicited at certain points during the process execution (e.g. questionnaire-based)
  → observational - data is collected as the process is executed, without direction from the researcher (e.g. “think-aloud”)
Observational Studies

- Guidelines for running observational studies
  - Want minimum disruption to process and process executor
    → The process being observed should be as close as possible to the process as normally executed, but the act of observing may change the executor’s behavior.
  - Want to be confident about accuracy of data
    → Ideally, collect different forms of data for every important point to help pinpoint discrepancies.

- Experimenting with a specific method for observational studies
  - 2-person teams consisting of:
    → Process Executor
      - applies a particular procedure [PBR] with a particular goal [detecting defects in the given requirements document]
      - should “think out loud” so that the process applied can be observed.
    → Process Observer
      - helps guide the Executor through the procedure
      - prompts the Executor for specific feedback about the procedure at certain times
      - takes notes on the Executor’s experiences with the procedure in practice
  - Process evaluation comes from:
    → Executor’s subjective experiences
    → Observer’s notes about good points, problems...
Important Life Lessons We Have Just Learned

- Executor may need to be reminded to “think aloud”
  - Not a natural process; may feel uncomfortable; but necessary if we are to understand what’s being done
- Executor may need to be reminded to follow the process as specified (e.g. not skip steps) - but should not be forced to
  - Observer should record when the Executor deviates from the process, but needs to make sure that the deviances aren’t accidental
- Observer should pay careful attention and record his/her observations
  - Need to increase confidence by checking against other observations or asking the Executor directly.
- Observer needs to make sure that certain categories of questions get answered, asking Executor directly if necessary.

Important Life Lessons We Have Just Learned (2)

- Types of issues: How can the process be better adapted to the way people actually work?
  - steps can be combined or reordered
  - the goal of a step can be better achieved some other way
  - steps can be added or deleted
- Need to ask whether observations are true in general or suited only to a particular class of user