

Lecture 4-2: Usability Methods I

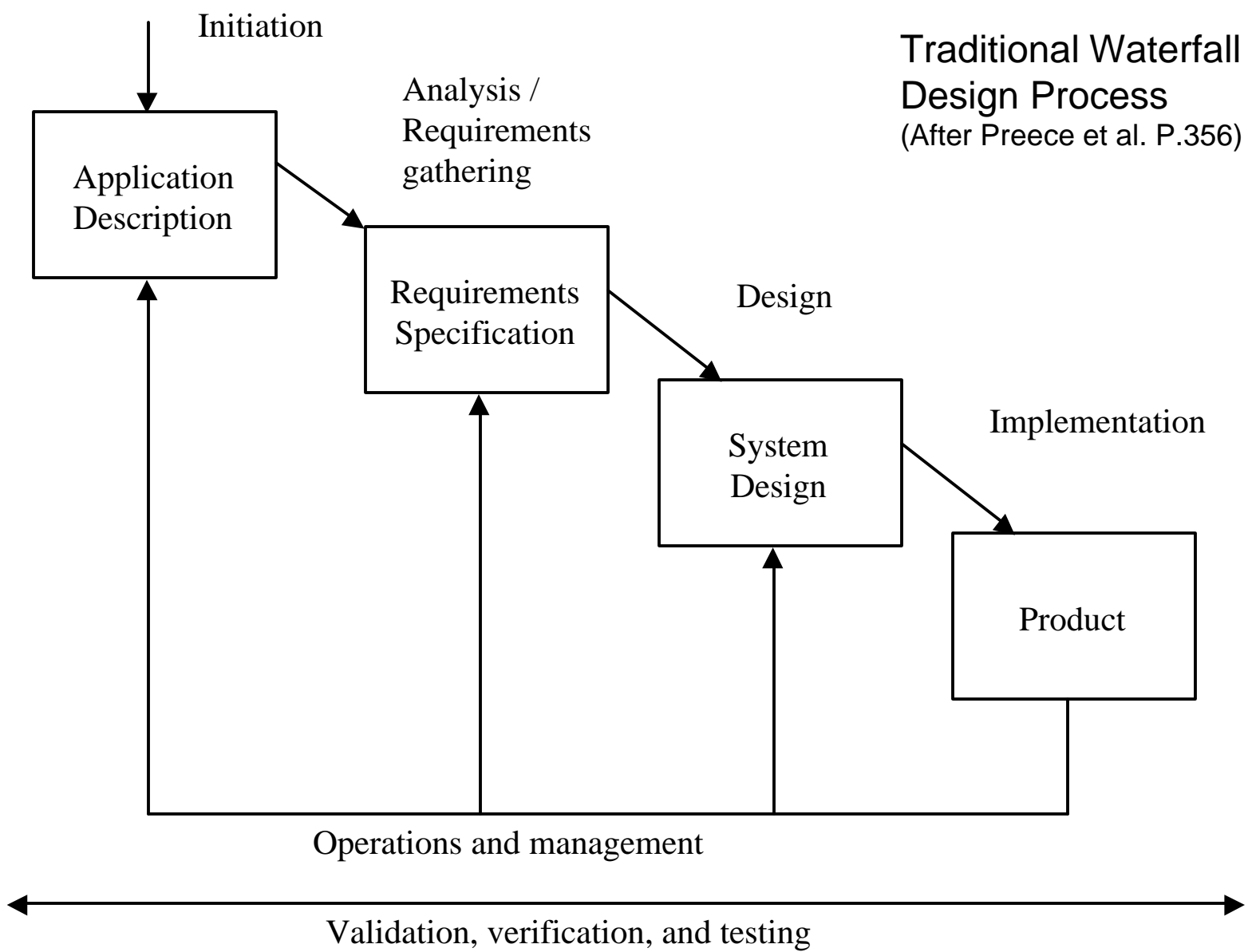
- Design Process
 - The Waterfall Model
 - Iterative Design: Gould and Lewis (1985)
 - User-Centered Design
 - Essential Design Activities: Cohill et al.
- Requirements
- Task Analysis
 - Formal Task Analyses
 - GOMS
 - Other
 - Informal Task Analyses

Study of the Design Process

- Why is the user experience professional concerned?
 - Large systems with legions of programmers / engineers require organization and process
 - Need a process for design, testing, version and change control
 - All large and most small companies follow implicit or explicit design processes
 - For user experience to have an impact, it must have a role in the process
- Meta-ergonomics
 - We often know the answers, why aren't they implemented?
 - Example: Airplane cockpits, different keyboards
- The opposite view: “Extreme Programming (XP)”
 - <http://www.extremeprogramming.org/>
 - <http://www.xprogramming.com/>

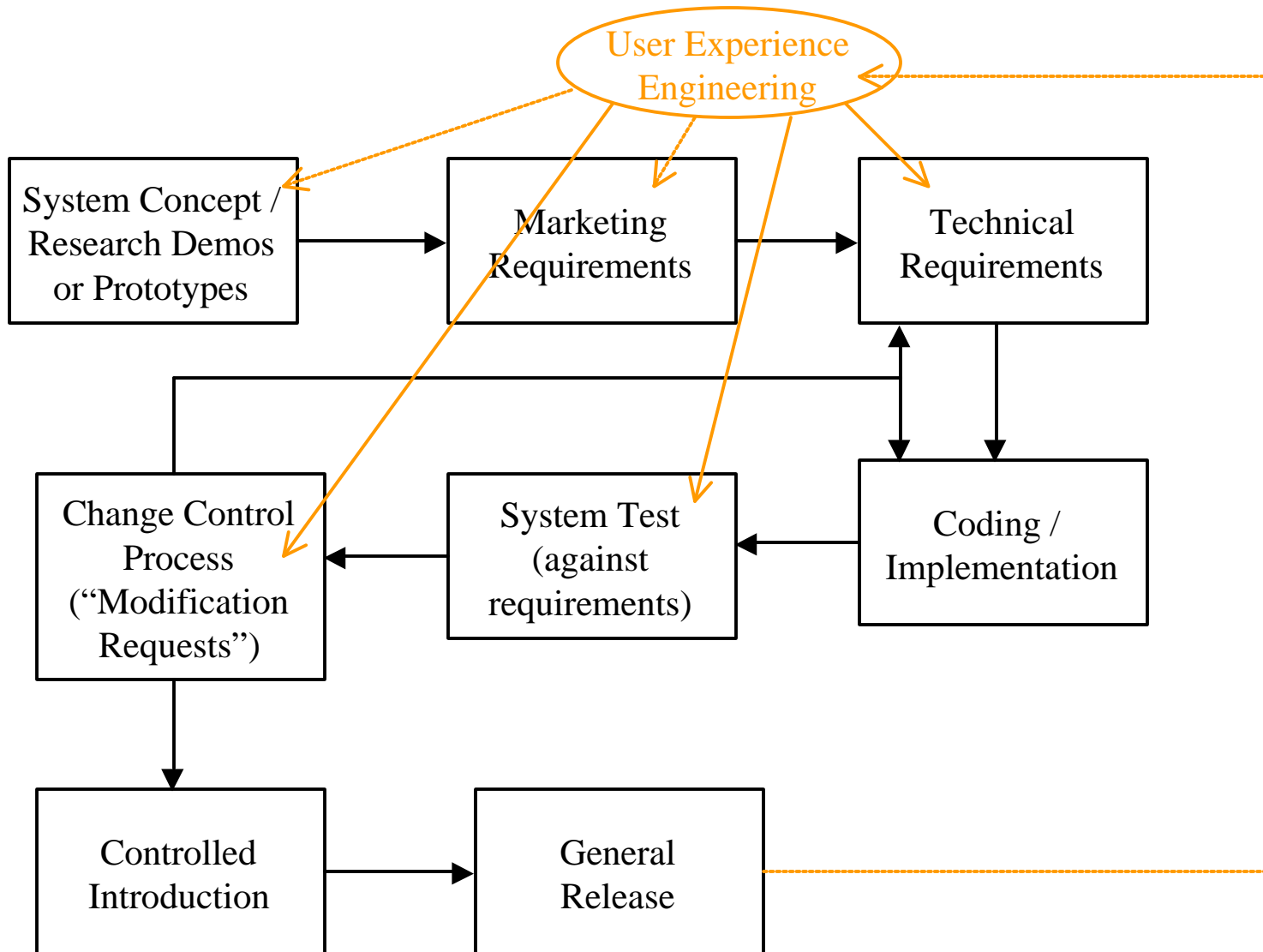
The Waterfall Model

- Traditional Requirements - Implement - Test Sequence
- Processes occur in linear fashion
 - Waterfall → outputs of each stage “flow down” to next
 - Traditionally with little or no feedback between people / stages
 - “Throw requirements over the fence”
- Problems with the traditional process
 - Requirements can be ambiguous
 - No way to modify requirements
 - Need dialog between designers and implementors
 - Little or no attention to product life cycle during and after general release
 - Impossible to understand and express user requirements until design (and even implementation) has been fairly far along



What Really Happens?

- Detailed design process models and checkpoints
 - Typical of most projects in large companies
 - Necessary for large projects (telephone switches, aircraft, NASA, control systems)
 - Hundreds of engineers and programmers
 - ISO 9000 → quality design process standards
- Informal, flexible, and/or undocumented design process
 - Small companies, Internet start-ups etc.
 - “Skunkworks” projects or small projects in big companies
- No design process
 - One person projects?



Generalized & Simplified
 AT&T / Bell Labs / Lucent Design Process
It's more or less the waterfall model

Iterative Design

- Gould & Lewis (1985)
Designing for Usability: Key Principles and What Designers Think. *Communications of the ACM*. 28(3), p. 300 ff.
- The “key principles”
 - Early focus on users and tasks
 - Empirical measurement
 - Iterative design
- “What designers think”
 - Developers asked to write down design process steps
 - Most developers did not mention the “key principles” (98%)
 - They draw these inferences:
 - Principles are “common sense” but not fully understood
 - There’s a difference between ideals and what’s actually done

Iterative Design: The Principles (1)

- Early focus on users
 - Must understand who the users are
 - Cognition, behavior, anthropometry, social/attitudes
 - Design team should have *direct contact* with users
 - Interviews, discussions, observations
 - Interviews should be conducted prior to system design
 - Instead of developing a system and presenting it
 - Users should participate in the design
 - Not just “sign off” or “review”
- Empirical Measurement
 - Users should use simulations and prototypes on “real work”
 - This should be done early in the development cycle
 - Performance should be observed, recorded, analyzed
 - Should measure learnability and usability
 - Different from just watching how people use and react to the prototype

Iterative Design: The Principles (2)

- Iterative Design
 - Fix problems found in user testing
 - Cycle of design - test - measure - re-design - etc.
 - A single iteration is not sufficient
 - Use of “testable” behavioral evaluations is extremely important
 - Examples: task completion, number of errors, time taken to complete task, ratings, observations
 - Prototype = Simulation or model of real system without full backend functionality, may likely share no components of actual system
 - cheap, easy, and fast to change, often a “user interface only”

