Requirements Analysis

Overview

- What is **requirement**?
- Classification of requirements
- Iterative and evolutionary requirements analysis
- Use cases

Requirements

- Definition [LAR]
  - Capabilities and conditions to which the system—and more broadly, the project—much conform
- Focusing on the **WHAT** not the **HOW**

Requirements Analysis Is Hard

- Major causes of project failures
  - Incomplete requirements
  - Changing requirements
  - Poor user input
- Essential solutions
  - Classification of requirements
  - Iterative and evolutionary requirements analysis
  - Use Cases

Classification of Requirements

- Functional: features, capabilities, security
  - "The system reads employee records and prints paychecks"
  - All other reqs are non-functional
- Usability: human factors, help, documentation
  - "Text on the display must be visible from 1 meter."

Classification of Requirements

- Reliability: frequency of failure, recoverability, predictability
  - "When doing search, the radar should have 28 hours MTBF(mean time between failures)"
- Performance: response times, throughput, accuracy, availability, resource usage
  - "The server response time is <1 sec for 90% of the accesses"

Classification of Requirements

- Supportability: adaptability, maintainability, internationalization, configurability
  - "The system should allow frequent and easy changes in the network configuration"
- Implementation: resource limitations, languages, tools, hardware
  - "Must use Linux and Java"

Iterative and Evolutionary Requirements Analysis

- Motivation
  - 20-50% of the original reqs change because of miscommunication or changing business needs
- Strategies
  - 10-20% of the most architecturally significant, risky, and high-business-value requirements are specified before the initial implementation
  - The short duration of iterations allows quick adaptation and increments of reqs.

Requirements Elicitation

- Brainstorming
  - Gather stakeholders, collect ideas and prune
- Interviewing
  - Formal or informal interviews with stakeholders
- Ethnography
  - A social scientist observes and analyzes how people actually work
- Strawman/Prototype
  - GUI, flow charts of UIs