

Software Engineering (IS303)

Analysis Concepts and Principles

Doro Edi, ST., M. Kom.
k_doroedi@yahoo.com

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What Are the Real Problems?

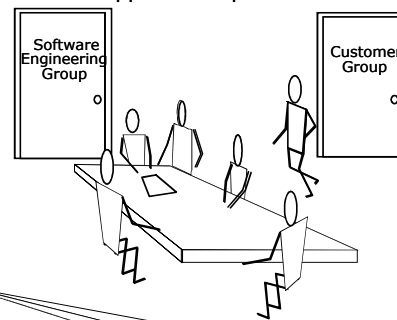
- the customer has only a vague idea of what is required
- the developer is willing to proceed with the "vague idea" on the assumption that "we'll fill in the details as we go"
- the customer keeps changing requirements
- the developer is "ratched" by these changes, making errors in specifications and development
and so it goes ...

Software Requirements Analysis

- › identify the "customer" and work together to negotiate "product-level" requirements
- › build an analysis model
 - focus on data
 - define function
 - represent behavior
- › prototype areas of uncertainty
- › develop a specification that will guide design
- › conduct formal technical reviews

Requirements Gathering

Facilitated Application Specification Techniques



FAST Guidelines

- › participants must attend entire meeting
- › all participants are equal
- › preparation is as important as meeting
- › all pre-meeting documents are to be viewed as "proposed"
- › off-site meeting location is preferred
- › set an agenda and maintain it
- › don't get mired in technical detail

J. Wood & D. Silver

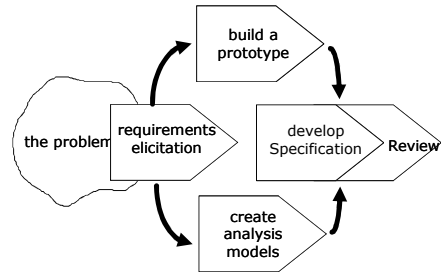
Quality Function Deployment

- › Function deployment determines the "value" (as perceived by the customer) of each function required of the system
- › Information deployment identifies data objects and events
- › Task deployment examines the behavior of the system
- › Value analysis determines the relative priority of requirements

Use-Cases

- › A collection of scenarios that describe the thread of usage of a system
- › Each scenario is described from the point-of-view of an "actor"—a person or device that interacts with the software in some way
- › Each scenario answers the following questions:
 - What are the main tasks of functions performed by the actor?
 - What system information will the actor acquire, produce or change?
 - Will the actor inform the system about environmental changes?
 - What information does the actor require of the system?
 - Does the actor wish to be informed about unexpected changes

The Analysis Process



Analysis Principle I Model the Data Domain

- › define data objects
- › describe data attributes
- › establish data relationships

Analysis Principle II Model Function

- › identify functions that transform data objects
- › indicate how data flow through the system
- › represent producers and consumers of data

Analysis Principle III Model Behavior

- › indicate different states of the system
- › specify events that cause the system to change state

Analysis Principle IV Partition the Models

- › refine each model to represent lower levels of abstraction
 - refine data objects
 - create a functional hierarchy
 - represent behavior at different levels of detail

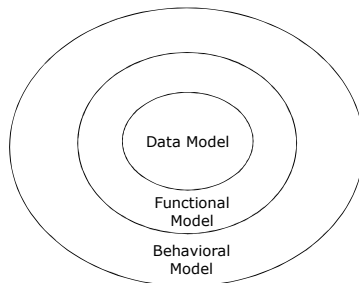
Analysis Principle V Essence

- ▶ begin by focusing on the essence of the problem without regard to implementation details

Davis' Principles

- ▶ Understand the problem before you begin to create the analysis model.
- ▶ Develop prototypes that enable a user to understand how human-machine interaction will occur.
- ▶ Record the origin of and the reason for every requirement.
- ▶ Use multiple views of requirements.
- ▶ Prioritize requirements.
- ▶ Work to eliminate ambiguity.

The Analysis Model



Questions??

