

### Software Development

Development Process

Design Principles

Design Patterns

Requirement Analysis

### Design Quality

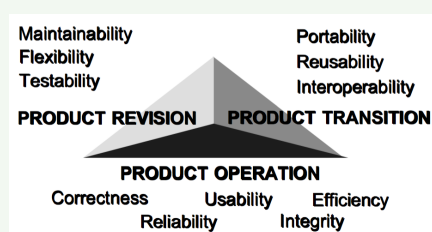
Quality Models

Design Quality Metrics

Design Quality Characteristics

O-O Metrics : C&K and MOOD

### McCall's Triangle of Quality



### Quality Characteristics

Modularity

Cohesion

Coupling

Understandability

Sufficiency

Robustness

Flexibility

Reusability

Efficiency

Reliability

### Architectures

Software components

Key Factors

Architectural styles

### Quality Attributes

Correctness

Maintainability

Usability

### Program Representation

AST

CFG

Data Dependency Graph

Optimisations

### Software Evolution

Evolution vs Maintenance

Laws of Software Evolution

Staged Model of Evolution

Legacy Software Evolution

Wrapping, Migration

### Architectural Styles

Layered

MVC

Pipe-and-Filter

Client-Server

Peer-to-peer

Service-Oriented

Publish-Subscribe

Edge-dominant

3-Tier / Multi-tier

Implicit Invocation

### Design Patterns

Input Control Patterns Front Controller, Page Controller

Request encapsulation and execution pattern Command pattern, Application controller, Command processor

Output Control Patterns Template View, Transform View

Access Control Patterns Firewall proxy, Authorization

Messaging Patterns Channel, Endpoint, Translator, Router, scatter-gather, aggregator, splitter

Object Interaction Patterns Observer, Mediator, Facade, Memento, Data Transfer Object, Double dispatch

### Design Principles

Information Hiding

Separation of Concerns

Open Close Principle

Interface Segregation Principle

Program to Interface

Dependency Inversion

Object composition over inheritance



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