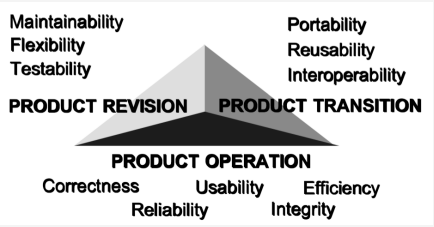
Software Development

- 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
- Maintainabilty
- 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	Wraping, 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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