Pattern – Oriented Software Architecture

Content

- Brief history
- A Definition
- Simple Example
- Properties of Patterns
- Pattern Categories
- Describing Patterns
- Future

Brief History

- Christopher Alexander

Picture from
www.wired.com/wired/archive/12.03/play.html?pg=1

What is a Pattern?

'A Pattern in software architecture describes a particular recurring design problem that arises in specific design context, and presents a well-proven generic scheme for its solution. The solution scheme is specified by describing its constituent components, there responsibilities and relationships, and the way in which they collaborate.'

Definition from
Pattern – oriented software Architecture

An Example

Layers

Properties of Patterns

- Address a recurring Problem
- Document design experience
- Manage software complexity
- A common vocabulary
- Identify and Specify abstraction

Pattern Categories

Three main categories

- Architectural Patterns
- Design Patterns
- Idioms

Architectural Patterns

- Highest level Patterns
- Template for software architecture
- Used at the beginning of design activity

Design Patterns

- Medium scale patterns
- Express scheme for components and their relationships.
- Influence sub-system architecture
- Programming language independent

Idioms

- Low-level patterns
- Language specific
- Capture existing programming experience
- Deal with implementation-specific problems

Pattern Description

- Need to present patterns in appropriate form
- Capture the essence of the pattern
- Provide implementation details
- Use diagrams & scenarios

Pattern Description template

Name	Meaningful name and short summary
Example	Demonstrate existence of the problem & need for the pattern.
Context	Situation in which the pattern may apply
Problem	Problem addressed & forces associated
Solution	Solution principle underlying the pattern
Structure	Specification of the structural aspect

Pattern Description template

Dynamics	Run-time behaviour
Implementation	Guideline for implementation
Variants	Description of variants
Known Uses	Examples of the use of the pattern
Consequences	Benefits and potential liabilities
See Also	Reference to patterns that solve similar problems

The Future

- Pattern Mining

Summary

- ✓ Brief history
- ✓ A Definition
- ✓ Simple Example
- ✓ Properties of Patterns
- ✓ Pattern Categories
- ✓ Describing Patterns
- ✓ Future

Useful Resources

- Books

  Pattern – Oriented Software Architecture ISBN 071958697

  Design patterns : elements of reusable object-oriented software

- Patterns Home

  http://hillside.net/patterns/