

ULRR

Architecture knowledge management

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Project Title	Architecture Development and Conformance Analysis

Architectural Knowledge

- Architectural knowledge can be characterized by the technical and contextual information that support decisions related to software architecture of a system or a family of systems.

Architectural Knowledge Management

- Architectural knowledge management aims to introduce various processes and practices for identifying, capturing architectural knowledge and expertise and making it available for transfer and reuse across projects.

Unavailable of software architecture knowledge results in:

- system evolution problems
- difficulties in detecting and correcting design errors
- architectural mismatches between COTS components

Challenges in architecture knowledge management

- Lack of support in terms of practices and tools
- What types of architectural knowledge is useful
- How to store and manage the knowledge
- Make knowledge capture cost-effective
- Make architecture knowledge easy to access

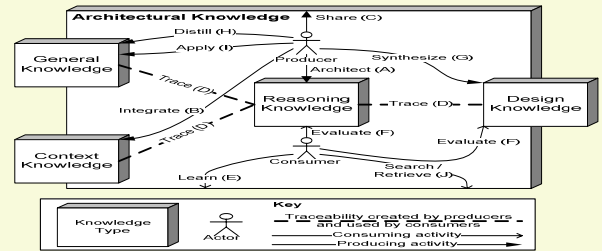


Figure 1: Architectural knowledge activities

Categories of Architectural Knowledge

- Context knowledge is a collection of information from the problem space that influences the design.
- General knowledge is a collection of reusable design artefacts such as architectural styles and patterns.
- Reasoning knowledge is a collection of design decisions, design rationale and design alternatives.
- Design knowledge is a collection of design outcomes regarding a particular system.

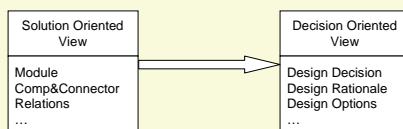


Figure 2: Architectural knowledge management task model

Specific Questions to Investigate

- Where is the architecture knowledge (architects' mind, meeting minutes, and etc.)?
- What are the influencing factors (requirement, organization constrains, schedule, and etc.)?
- What's the evidence of benefits in terms of money, time to market, employee satisfactory and etc?
- What characteristics does important design decisions have?
- How does an architecture ontology look like?
- How to describe architecture ontology?
- How to share architecture knowledge?

Figure 3: Solution Oriented vs. Decision Oriented



Research methods

- Case study
- Interview
- Survey

Expected Output

- Ontology/Model/Notations
- Guidelines/Process
- Tools

Work done so far

- Systematic literature review of variability management in SPL (1 paper submitted to ESEM 2008)
- Industry engagement in TECNOMEN

Work to do

- Literature review
- Case study and interviews in TECNOMEN
- Architecture ontology development
- Tool development