Architectural Knowledge Management Strategies: Approaches in Research and Industry

M. Ali Babar, Remco C. de Boer, Torgeir Dingsøyr, Rik Farenhorst

Talk’s Outline

• Problem Statement
• Current Approaches to Architectural Knowledge Management (AKM)
• Knowledge Management (KM) Strategies
• AKM Trends
• A Taxonomy of KM Schools of Thoughts
• Ongoing and Future Work
Managing Architectural Knowledge

- Knowledge management has received little attention in the software architecture discipline
- Increased demand from industry for suitable methods, techniques, and tools for capturing and maintaining architectural knowledge
- *So far, no attempt to provide an overview of the current approaches to managing architectural knowledge*
- *No structured comparison of the architectural knowledge management approaches with knowledge management theories*

Current Approaches – Research

<table>
<thead>
<tr>
<th>Approaches</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADDSS</td>
<td>Web-based tool for recording architectural design decisions</td>
</tr>
<tr>
<td>PAKME</td>
<td>Process-based knowledge management environment for generic and project specific knowledge</td>
</tr>
<tr>
<td>DGA DDR</td>
<td>Design decision rationale documentation technique for decision goals and design alternatives</td>
</tr>
<tr>
<td>GRIFFIN</td>
<td>Software architecture project memory to manage know-why and know-how</td>
</tr>
</tbody>
</table>
### Current Approaches – Industry

<table>
<thead>
<tr>
<th>Approach</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RFP</td>
<td>Knowledge repository for reusing best practices with questionnaire as a front end.</td>
</tr>
<tr>
<td>VCC</td>
<td>Architectural rules disseminated by means of small text-based documents</td>
</tr>
<tr>
<td>RBS</td>
<td>A knowledge base harbouring reusable quality criteria</td>
</tr>
<tr>
<td>DSTO</td>
<td>An architectural knowledge management tool to improve architectural evaluation process</td>
</tr>
</tbody>
</table>

### Knowledge Management Strategies

**Codification**
- High quality, reliable, and rapid use of knowledge
- High IT investment
- Rewards for sharing & reusing codified knowledge

**Personalization**
- Connecting people & channelling individual expertise
- Moderate IT investment
- Reward for sharing knowledge face to face

**Hybrid approach**
- Codify organization-wide knowledge
- Personalize local & context specific knowledge
AKM Trends in Industry and Research

Kinds of Knowledge Management

Research focuses almost solely on codification and not on other knowledge management schools?
Ongoing and Future Work

- Thorough review of the reported topics
- Helping choose suitable approaches
- Architectural knowledge management challenges and opportunities in new paradigms such as
  - Software product lines
  - Agile approaches
  - Open source development
- Bridging the gap between industry and research in AKM
- Determining the suitability and mechanics of hybrid strategy

Thank You