Architecture Engagement Purposes
Towards a Framework for Planning “Just Enough”-Architecting

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„The system shall be capable to handle three times more parallel users than before. You have one person month of effort.“
Questions Arise

- How to invest available effort for architecture work?
- What activities need to be done to achieve a goal?
- What level of detail is sufficient?
- When to stop?
- How to convince management of the necessity of architecture work?
- How to prove benefit of architecture work?
- What is the return on investment?
- …

Planning Architecture Work
An Architecture Engagement Purpose (AEP) is a crisp and concise description of a specific purpose and of all architecting activities to be performed to satisfy this purpose.
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Template for Guidance of Architect

Specific purpose

Architecting activities to be performed to satisfy this purpose
Definition

An Architecture Engagement Purpose (AEP) is a crisp and concise description of a specific purpose and of all architecting activities to be performed to satisfy this purpose.
Purposes to be Addressed with Architecture

- Achieving a certain quality
- System migration
- Decision about redevelopment
- Evolution of a system
- Technology selection
- …
## 3x #Users: AEP Specification

<table>
<thead>
<tr>
<th>Name</th>
<th>3x #users</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purpose</strong></td>
<td>Change system to support 3 times of the number of today's users</td>
</tr>
<tr>
<td><strong>Lifecycle Trigger</strong></td>
<td>New business opportunity in new sector</td>
</tr>
<tr>
<td><strong>Lifecycle Impact</strong></td>
<td>Change has to be implemented</td>
</tr>
<tr>
<td></td>
<td>Change has to be tested</td>
</tr>
<tr>
<td><strong>Constraints</strong></td>
<td>In Budget: One person month architecting effort</td>
</tr>
<tr>
<td><strong>Level of Confidence</strong></td>
<td>Agreement between architect and developer that the concepts work</td>
</tr>
<tr>
<td></td>
<td>Feasibility checked with prototype</td>
</tr>
<tr>
<td><strong>Confidence Measure</strong></td>
<td>Working prototype achieving new user numbers</td>
</tr>
</tbody>
</table>
An Architecture Engagement Purpose (AEP) is a crisp and concise description of a specific purpose and of all architecting activities to be performed to satisfy this purpose.
Typical Architecture Activities

**Investment**
- Requirements Analysis
- Model-Based Simulation
- Impact Analysis
- Model Building
- Architecture Documentation
- Customized Documentation
- Compliance Checking
- Effort Estimation
- Architecture Reconstruction
- Code Generation

**Prediction**

**Derivation**
- Task Specific Guidelines Creation

**Control**
- Continuous Quality Assurance
## Architecting Activities

<table>
<thead>
<tr>
<th>Name</th>
<th>Define high-performance architecture</th>
<th>Predict and test performance</th>
<th>Migrate implementation to high-performance architecture</th>
<th>Check compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Category</strong></td>
<td>Investment</td>
<td>Prediction</td>
<td>Derivation</td>
<td>Control</td>
</tr>
<tr>
<td><strong>Effort</strong></td>
<td>10 PD</td>
<td>5 PD</td>
<td>3 PD</td>
<td>2 PD</td>
</tr>
<tr>
<td><strong>Due Date</strong></td>
<td>April 08</td>
<td>April 29</td>
<td>May 10</td>
<td>May 15</td>
</tr>
<tr>
<td><strong>Precondition</strong></td>
<td>-</td>
<td>Sufficient architecture model</td>
<td>Agreement that concepts work</td>
<td>Implementation complete</td>
</tr>
<tr>
<td><strong>Postcondition</strong></td>
<td></td>
<td></td>
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<tr>
<td><strong>Detailed Description</strong></td>
<td>Clarify requirements</td>
<td>Simulate usage load</td>
<td>Generate change documentation</td>
<td>Check architecture compliance of changed implementation</td>
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<tr>
<td></td>
<td>Identify bottlenecks</td>
<td>Build prototype</td>
<td>Generate stubs</td>
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<tr>
<td></td>
<td>Build performance model</td>
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</tr>
<tr>
<td></td>
<td>Build prototypes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Status</strong></td>
<td>Started</td>
<td>Not Started</td>
<td>Not Started</td>
<td>Not Started</td>
</tr>
</tbody>
</table>
Experiences with AEPs in Action
Benefits & Challenges of Planning Architecting with AEPs

- Benefits
  - Focusing architecture work
  - Transparency in architecture costs and benefits
  - Coordination of teams

- Challenges & Future Work
  - Defining confidence levels
  - Measurability
  - Too little guidance for estimations
  - Some aspects not possible to predict
  - Continuous refinement
  - Empirical evidence