GSW 2008 Architecture Workshop

Architecture Development for Responsive Operational Systems

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GSAW 2008 Architecture Workshop Topics

1. Architecture Development Trends
2. Leveraging Flexible Architectures: Examples
3. Value-Added Architecture / Process Attributes
4. Acronyms
1. Architecture Development Trends

1. Architecture Quality Evaluation Process (SEI ATAM..)
2. Verification using Dynamic Models and Testbeds
3. Early Day-in-the-Life / OPSCON Scenario Development
4. Early and Continuing Architecture Quality Evaluation
5. Architecture Technology Demonstrations
6. Architecture FMECA Verification
7. Static Architecture Evaluation: UML 2 Views
8. Legacy, COTS, Web-Based Reuse (Applets..)
9. Use of Design Patterns and Open Source Software
10. Small, Agile-Like Integrated Product Teams
## 2. Leveraging Flexible Architectures: Examples

<table>
<thead>
<tr>
<th>Attribute / Program</th>
<th>Demo A</th>
<th>Demo B</th>
<th>Program C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective</td>
<td>TCPED</td>
<td>End-to-End</td>
<td>MDP</td>
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<tr>
<td>Requirements, CONOPS Baseline</td>
<td>High-Level</td>
<td>High-Level</td>
<td>Formal</td>
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<tr>
<td>Architecture Approach</td>
<td>Web / Legacy Components</td>
<td>Web / Legacy Components</td>
<td>Pipeline, Parallel Servers, SAN</td>
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<tr>
<td>Architecture Assessment Method</td>
<td>RUP, Functional Decomposition</td>
<td>ATAM, DODAF</td>
<td>RUP, Functional Decomposition</td>
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<tr>
<td>Early / Continuous Architecture Verification</td>
<td>Demo / Analysis</td>
<td>Demo / Analysis</td>
<td>Testbed, Dynamic Model</td>
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<tr>
<td>Top-Level Requirements Volatility</td>
<td>Moderate-High</td>
<td>Moderate-Low</td>
<td>Low</td>
</tr>
<tr>
<td>Build Cycle Time (weeks)</td>
<td>1-2</td>
<td>1-2</td>
<td>6</td>
</tr>
<tr>
<td>Architecture Risk</td>
<td>Multiple Legacy Products + Web</td>
<td>Multiple Legacy Products + Web</td>
<td>Multi-Server SAN, FMECA</td>
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<tr>
<td>End-to-End Verification per Build</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Development Span (months)</td>
<td>6</td>
<td>4</td>
<td>40</td>
</tr>
<tr>
<td>Technical, Cost, Schedule Goals</td>
<td>Met</td>
<td>Exceeded</td>
<td>Met</td>
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3. Value-Added Architecture Attributes

1. Formal Process for Architecture Quality Evaluation
2. Dynamic Modeling / Simulation to Verify Architecture
3. Formal Analysis of Failure Modes / Response
4. Early Day-in-the-Life Scenario Development
5. Early End-to-End Integration / Demonstration
6. End-to-End, Test-per-Build Architecture Verification
7. Web-Based / Service-Oriented Architectures

4. Acronyms

- **ATAM**  Architecture Tradeoff Analysis Method
  (See CMU / Software Engineering Institute for process detail)
- **CONOPS**  Concept of Operations
- **COTS**  Commercial Off The Shelf
- **DODAF**  Department of Defense Architecture Framework
- **FMECA**  Failure Modes, Effects and Criticality Analysis
- **MDP**  Mission Data Processing
- **OPSCON**  Operational Concepts (CONOPS detailed to operations/components )
- **RUP**  Rational Unified Process
- **SAN**  Storage Area Network
- **SEI**  Software Engineering Institute (CMU)
- **TCPED**  Tasking, Collection, Processing, Exploitation and Dissemination
- **UML**  Unified Modeling Language