Reflection on 20 Years of Architecture

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In 1992
From Architecture Evaluation….

What if the quality requirements are not well-understood?
- Quality Attribute Workshop (QAW)

What if there’s no architecture?
- Attribute Driven Design (ADD)

What if I don’t know my system’s architecture?
- Architecture Reconstruction using ARMIN

What information should be included in my architecture documentation?
- Views and Beyond Approach (VaB)

Our scenarios tend to be incomplete or ambiguous.
- Quality Attribute General Scenarios

What are some of the most important questions to ask?
- Quality Attribute Tactics

Is there formal modeling support?
- AADL, OSATE, Virtual Upgrade Method

How do I know if an organization has the ability to architect?
- Architecture Competence Instrument

What about system and SoS architectures?
- Mission Thread Workshop, System ATAM and SoS Arch Eval

Which risks should I work on first?
- Cost Benefit Analysis Method (CBAM)
Architecture-Centric Engineering (ACE) is the discipline of using architecture as the focal point for performing ongoing analyses to gain increasing levels of confidence that systems will support their business and mission goals.

The SEI developed principles, methods, foundations, techniques, tools, and materials in support of creating, fostering, and stimulating widespread transition of the ACE discipline.
Our View: ACE Requires One Must

- explicitly focus on quality attributes
- directly link to business and mission goals
- explicitly involve system stakeholders
- be grounded in state-of-the-art quality attribute models and reasoning frameworks
Epiphany in 2006

- Decentralization
- Inherently conflicting, unknowable, and diverse requirements
- Continuous evolution and deployment
- Heterogeneous, inconsistent, and changing elements
- Erosion of the people/system boundary
- Normal failures
- New paradigms for acquisition and policy
Today’s Challenges

- Scale and complexity
- Increased operational tempo
- Decentralization and distribution
- Disruptive technologies
Architecture Challenges

• What is the architecture of a socio-technical, cyber-physical system?
• What are the quality attributes that apply? And what are the underlying models?
• How can stakeholders be involved?
• ……
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