

A Case Study in applying Architecture Evaluation Methods

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Abstract:

This presentation will discuss our efforts to introduce scenario-based architectural evaluation methods for new systems development efforts within a division of Wells Fargo and Company, a diversified financial services company providing banking, insurance, investments, mortgage and consumer finance for more than 23 million customers through 6,100 stores, the internet and other distribution channels across North America and elsewhere internationally.

As part of the effort to ensure the production readiness of a major new software intensive system stakeholders wanted to explore how the architecture would respond to various potential catastrophic events or taxing usage scenarios. The overall system was composed of a number of component systems, some of which had been developed in house and some of which had been custom developed by vendors or procured as COTS. The component system architectures had been individually evaluated using a mix of more formal (e.g. ATAM) and less formal (Q&A walkthrough discussion) methods but there was a need to explore end-to-end performance and availability characteristics for the complete system.

We will describe how we leveraged SEI techniques such as the QAW and ATAM to create a hybrid evaluation method targeted at exploring quality attribute concerns in an environment where it was not feasible to introduce a full ATAM. We will discuss how we organized stakeholder participation in pre-work and the two one-day review sessions conducted in late 2006. We will share our observations and plans for future reviews and discuss the challenges in introducing architecture evaluations within a culture not previously familiar with scenario based methods as well as the challenges associated in bringing business and technical stakeholders together to discuss expectations and issues. In offering this presentation we hope to contribute to an active dialogue on architecture evaluation methods in the software development community.

Conducting an ATAM

David Mason, CECOM Software Engineering Center

The intent is to be able to discuss based on experience how to be part of an ATAM evaluation, either as an evaluator or an evaluatee, depending on the audience.

A Light-weight Architecture Trade Off Process Based on ATAM®

Jon Edmondson, Charles G. Kille & Edwin W. Lee, Raytheon Company

Presentation Abstract:

This paper presents the creation and application of a process we named “ATO Lite” (Architecture Trade Off Lite), derived from SEI's ATAM®. Transformation of ATAM® to “ATO Lite” created a front-end tool that assists architects with development of robust, focused architecture in a time- and cost-effective manner.

The ATO Lite process was conceived during the execution of a project to capture and assess architectural attributes and features of Net-Centric Architectures that improve the efficiency and quality of development in support of Mission Assurance goals.

We at Raytheon wanted to put a tool in place to assist during the development of a mission critical architecture that would enhance our focus on Mission Assurance, provide critical, early guidance, and inform the architecture team and its leadership about how to achieve success during the active architecture development process, whether or not the project was large enough to support a full ATAM® evaluation.

We started our efforts with two primary questions in mind: "Where does Mission Assurance assert itself in a Net-Centric Architecture?" And, "How can we be sure that we address Mission Assurance at an architectural level?"

We identified a subset of ATAM® activities that would be sufficient for the project's purpose. This subset is a less formal, less thorough, and less time- and cost-intensive execution of ATAM® where we focused squarely on Mission Assurance-related concerns. One of the benefits of this “abridged” version of ATAM®, hereafter referred to as “ATO Lite”, is that it can be applied as part of the initial architecture development (i.e., in a “forward looking” fashion, as opposed to evaluating a generated architecture in a “backward looking” fashion -- a working tool as opposed to an audit tool).

Application of the ATO Lite process requires significantly less effort than that required for a complete ATAM® assessment, yet (and importantly) we believe that it still provides a significant portion of the value that a complete ATAM® assessment offers. We achieved this by eliminating the formality, and reducing the scope of the meetings, documentation, and numbers of people required, while retaining our focus on generating the utility tree, quality attributes, and scenarios we believe best illuminated Mission Assurance qualities.

Many projects these days are on short turn cycles, employing spiral and/or some form of incremental development, and something like the ATO Lite approach will fit much better into each of these cyclical, quick turn development models as they become more and more dominant. It is our belief that every improvement that

keeps good, solid, effective, and efficient architecting and systems engineering process in each cycle/increment results in added value and promotes risk assessment and management, maximizing both value and agility.

The ATO-Lite process was initially developed by Raytheon's corporate Architecture-focused Technical Interest Groups and later enriched with improvements to documentation and application aids by our System Engineering & Technology Development Program team. The improvements and value that ATO-Lite represents is becoming a useful tool in our corporate engineering process and toolbox.