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# Realizing the Business Value of IT: An Approach for Architecture Evaluation

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## Overview

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  - Adaptations to the ATAM steps
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## Project Background

- Multi-year large scale development effort in the financial services industry – **developed and managed by in-house technology organization**
    - Emphasis on increasing market share and efficiency gains
    - Critical compliance and regulatory drivers/requirements
  - **System of systems integration** using SOA approach
    - Highly integrated set of enterprise applications to support lending business processes
    - Some components vendor-developed or acquired as COTS
    - In-house development and integration
  - Business Expectations
    - Tightly coordinated end-to-end process with emphasis on speed, accuracy and service
    - Common processes and technology solutions
    - Seamless customer experience and enterprise view of customer
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## Factors influencing the review approach

- Complex system – many stakeholders and requirements
    - Many different stakeholder/user expectations
    - Need to understand how the various components/systems interact towards meeting the overall business goals
  - In-house development effort - many benefits, yet may also lead to less formal methods for defining and clearly documenting key requirements and constraints
    - No RFP, no strict contractual guidelines
    - Mandate for flexibility has limitations/implications with regards to key architectural decisions
  - Lack of experience with large program management and architectural review methods
    - Participants needed additional education on the approach, its potential benefits, and the importance of each step
    - Ongoing facilitation needed to help ensure all parties focused on the mutually agreed upon goals and priorities
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## Adaptations to the ATAM steps

- Increased “pre-work” at the front end of the process to maximize the value of later group sessions
  - Focused on stakeholder selection and orientation
  - Refined the utility tree structure by adding thresholds and trigger events to help guide/focus scenario generation and evaluation during the review process
  - Focused scenario generation by leveraging outputs of earlier activity to define critical business processes
  - Added structure and emphasis to prioritization and follow up on review results
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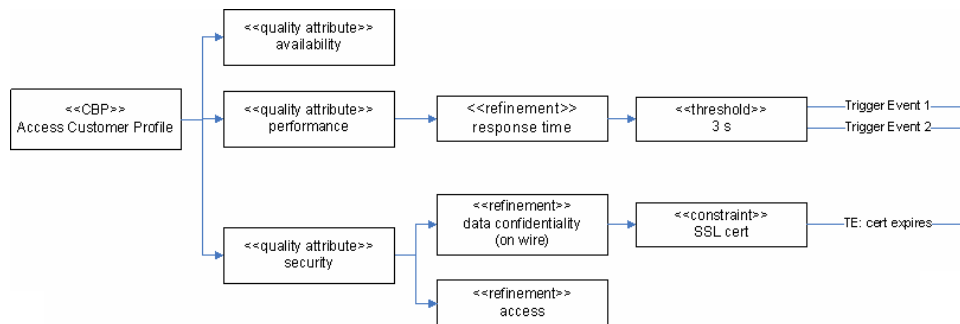
## ATAM Step 2: Present Business Drivers

- “The system to be evaluated needs to be understood by all participants in the evaluation” (CMU/SEI-2000-TR-004 p26)
  - Challenges
    - For a large system with diverse stakeholder groups it may not be easy to capture a view of business drivers which is concise yet comprehensive enough for the evaluation
    - Need to help business users focus and articulate what they want
    - Conflicts among stakeholder value propositions must be resolved or they can contribute to program failure (Boehm)
    - The 45 minutes allotted in a traditional ATAM may not be sufficient without adequate preparatory efforts to align stakeholders and reach agreement on key attributes – simply allowing more time is not the answer as it would be possible to lose the overall ATAM focus
  - Adaptation
    - Focused sessions with business stakeholders held in advance of the architecture review - used to elicit the Critical Business Processes (CBPs) which were the prioritized functions and characteristics key to the success of the implemented system
    - Key stakeholders and senior leadership reached consensus on the prioritized CBP list
    - The CBPs were “decomposed” – each business function was mapped to its constituent technical components and services – to help the technical teams more quickly evaluate the architectural aspects during the review sessions
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## ATAM Step 6: Generate Quality Attribute Utility Tree

- **Challenge – Defining the right level of quality attribute refinement for a system of systems and putting them in the context of business functions**
- **Adaptation - Documented vital quality attribute requirements and their associated threshold and constraints within context of critical business processes**
  - Modified the Utility Tree format to use Critical Business Process and then reflect the quality attributes and their refinements for each CBP
  - Defined trigger events and their associated thresholds/constraints that could create vulnerabilities in meeting the quality attribute requirements – helpful input to scenario generation later in review process



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## ATAM Step 7: Brainstorm and Prioritize Scenarios

- **Challenge - Identifying the important scenarios from a business context is nontrivial**
  - With a large complex system there are many possible relevant scenarios and its possible to spend a lot of review time generating and prioritizing scenarios which may not be the most critical in terms of impact and priority
  - Initially, review participants were heavily biased toward generating exploratory scenarios instead of use case and growth scenarios
  - It was easier/more engaging for review participants to talk about recovering from natural disasters or other low probability events
  - While it is important to think about disaster recovery, the business could suffer “a death by a thousand cuts” if the system could not meet basic customer expectations for day to day business and expected growth (specifically in the financial industry where it’s as important to plan for a refi boom as it is for managing in the wake of a natural disaster)
- **Adaptation – Used the pre-defined Critical Business Processes to guide scenario generation and keep the review participants focused on what is most important to the business**
  - Focus on use case scenarios based on the functions described in the CBPs and the trigger events identified during utility tree generation
  - Generate growth scenarios based on likely industry/market trends which would stress the system, using the thresholds and constraints identified in pre-work
  - Use the CBP decompositions to guide the architectural analysis of the scenarios
  - Exploratory scenarios are still important, follow up activity focusing on ITSCM (Service Continuity Management) can leverage these scenarios for recovery planning

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## ATAM Step 9: Present Results

- Challenge – realizing return on the ATAM investment through follow up action while continuing development and delivery of the system
  - There were a number of well prepared write-up and action item lists from earlier ATAMs and other review exercises which were not applied in the day to day management and program decision making
  - If the ATAM identifies critical risks which must be addressed before system roll-out we must find a way to leverage the results and promote follow through
- Adaptation - drive action and management follow up on key ATAM finding by:
  - Articulating outcomes in an actionable format
  - Prioritizing outcomes to help facilitate successful implementation of the business capability roadmap
    - Clearly identify which findings need to be resolved in order to deliver capabilities to the business
    - Other items may be queued up along with bug defects or change controls in order to better meet expectations of functionality already in the pipeline
  - Putting action items into existing risk tracking system and ensuring owners were assigned
  - Ensuring the program management office takes an active role in receiving the results and following up with action item owners

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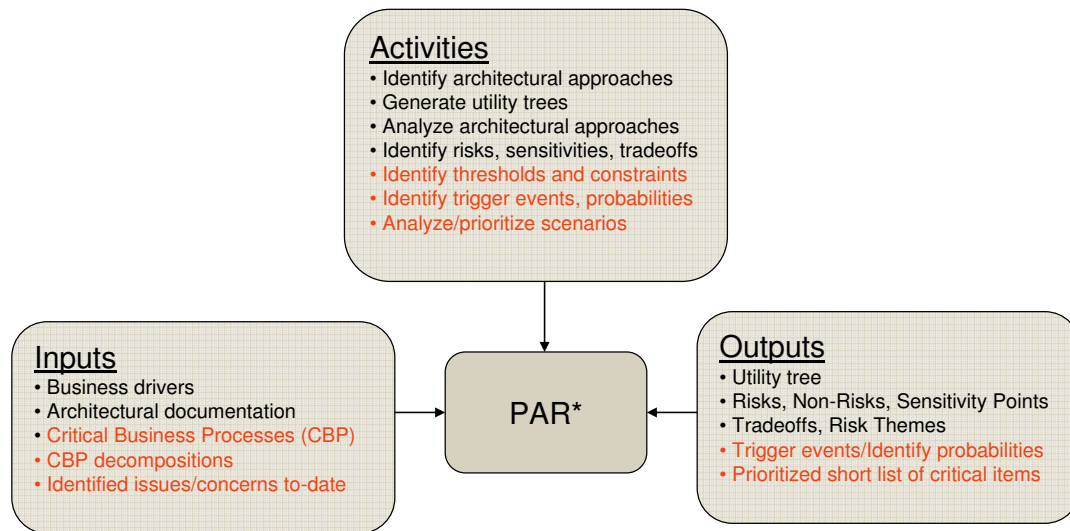
## Lessons Learned

- Understand and address varying stakeholder backgrounds – don't underestimate the business/IT divide
- While there *\*should\** be well documented requirements and business case artifacts there are many reasons why these may not be complete or accurate – be prepared to invest time in improving input materials to enhance the chance of a successful review
- Non-technical stakeholders (and some technical stakeholders) may need time to fully grasp the scenario format and why its specific construct is valuable in evaluating the architecture
- When reviews are conducted on a system under continuing development it is critical to develop follow mechanism so the risks, trade-offs, and sensitivity points identified during the review will remain visible and be used to guide architectural and implementation decisions
- Careful tailoring of the ATAM to fit the unique organizational environment is critical to sponsorship and ongoing support

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# PAR\* Overview



\*Performance Architecture Review