

K J Somaiya College of Engineering
(A Constituent College of Somaiya Vidyavihar University)
Department of Computer Engineering

TITLE : ATAM - Architecture Trade-off Analysis Method for B E Project.

AIM : To apply Human-centric analysis process ATAM for identifying risks early on in software design for the B E Project.

Expected OUTCOME of Experiment:

Books/ Journals/ Websites referred:

1 “Software Architecture, Richard N Taylor etl, Wiley

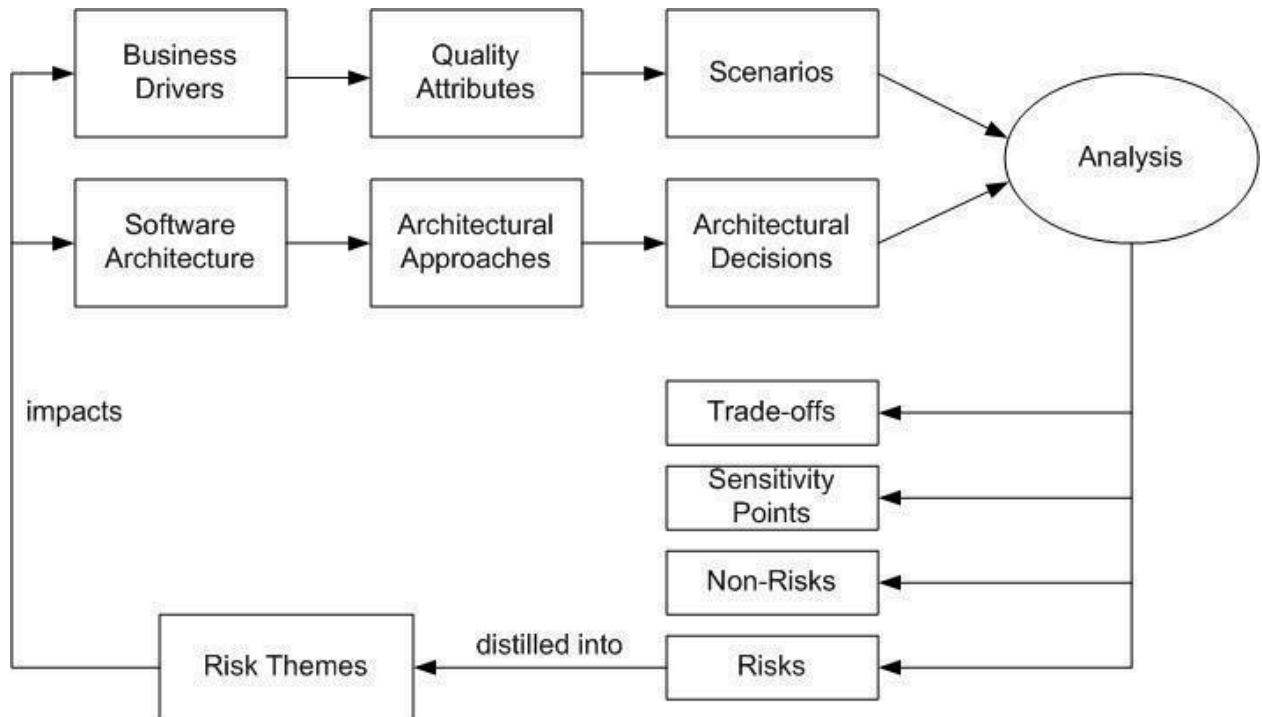
Theory:

ATAM stands for architectural trade-off analysis method. This method
Focuses specifically on four quality attributes (NFPs)

1. Modifiability
2. Security
3. Performance
4. Reliability

ATAM reveals how well an architecture satisfies quality goals and how those goals trade-off.

ATAM Process:



The following scenarios can be used:

Use-case scenarios

- Describe how the system is envisioned by the stakeholders to be used

Growth scenarios

- Describe planned and envisioned modifications to the architecture

Exploratory scenarios

- Try to establish the limits of architecture's adaptability with respect to system's functionality, operational profiles, underlying execution platforms
- Scenarios are prioritized based on importance to Stakeholders

ATAM in a nutshell:

Goals	Completeness	
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	Consistency	
	Compatibility	
	Correctness`	
Scope	Subsystem- and system-level	
	Data exchange	
Concern	Non-functional	
Models	Informal	
	Semi-formal	
Type	Scenario-driven	
Automation Level	Manual	
Stakeholders	Architects	
	Developers	
	Managers	
	Customers	

ATAM Analysis of B E Project:

Attached in separate file.

Post Lab Descriptive Questions

1 . What are the other methods of NFP analysis

Non-functional analysis involves evaluating various attributes of a system that are not directly related to its functional requirements. Apart from the ATAM (Architecture Tradeoff Analysis Method), several other methods can be used to assess non-functional qualities:

1. SAAM (Software Architecture Analysis Method): Focuses on identifying and analyzing quality attributes in the software architecture, providing a way to evaluate how well the architecture meets various quality goals.
2. CBAM (Cost Benefit Analysis Method): Builds on SAAM by incorporating a cost-benefit analysis to help stakeholders understand the trade-offs between architectural decisions and their impacts on quality attributes.
3. QAW (Quality Attribute Workshop): A collaborative approach that gathers stakeholders to identify and prioritize quality attribute scenarios, facilitating discussions around requirements and design decisions.
4. Scenario-Based Analysis: Involves creating scenarios that represent potential usage of the system, helping to identify non-functional requirements and assess how the architecture can fulfill them.

5. **Architecture Evaluation using Quality Metrics:** This method involves defining specific metrics (e.g., response time, throughput, reliability) and using them to quantitatively evaluate architectural designs.
6. **Architecture Review Board (ARB):** A governance body that regularly reviews architecture decisions to ensure alignment with non-functional goals and organizational standards.
7. **Performance Testing and Profiling:** Focused on measuring the performance characteristics of the system under various conditions to identify bottlenecks and areas for improvement.
8. **Security Risk Analysis:** Assessing security-related non-functional requirements through methods like STRIDE or OCTAVE, which focus on identifying potential vulnerabilities and their impacts.
9. **Usability Evaluation:** Involves methods such as user testing and heuristic evaluations to assess the user experience and usability of the system.
10. **Maintainability Assessment:** Techniques like code reviews and refactoring analysis help evaluate how easily the system can be maintained and extended over time.

Each of these methods offers different perspectives and tools for assessing non-functional attributes, allowing teams to make informed architectural decisions.