

SATURN 2008

Architecture Evaluation: Experiences in Using SEI' ATAM

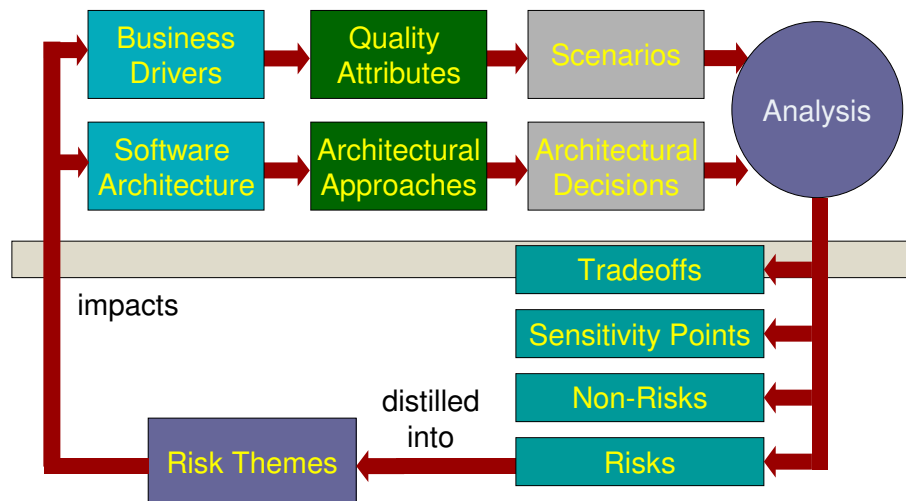
ATAM method to evaluate a
software testing automation
solution

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Conceptual Flow of the ATAM



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ATAM Evaluation Steps

Phase 0 – Start-up and partnership	Phase 1 – Initial Evaluation	Phase 2 – Complete Evaluation
S1 – Present ATAM S2 – Describe candidate system S3 – Make Go/No-Go decision S4 – Negotiate Statement of Work S5 – Form core evaluation team S6 – Hold evaluation team kick-off S7 – Prepare for phase 1 S8 – Review the Architecture	S1 – Present ATAM S2 – Present Business Drivers S3 – Present the architecture S4 – Identify architecture approaches S5 – Generate Quality Attribute Utility tree S6 – Analyze architectural approaches	S0 – Prepare for phase 2 S1 to S6 (Phase 1), with complete team S7 – Prioritizing scenarios P8 – Analyze architectural approaches P9 – Present results

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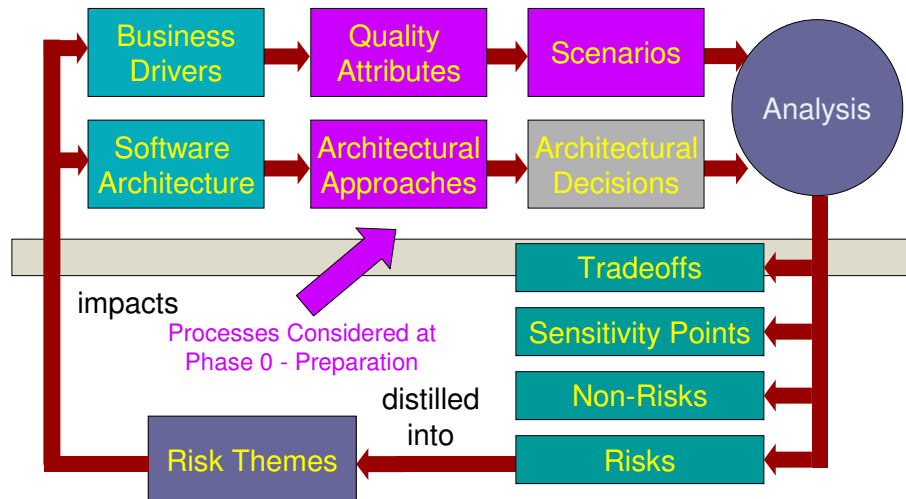
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Changes to the ATAM process



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Changes to the ATAM steps

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S1 – Present ATAM S2 – Describe candidate system S3 – Make Go/No-Go decision S4 – Negotiate Statement of Work S5 – Form core evaluation team S6 – Hold evaluation team kick-off S7 – Prepare for phase 1 S7.1 – Prepare preview of Architectural approaches S7.2 – Generate preview of Quality Attribute Utility Tree S7.4 – Link Architecture view x Scenarios S7.3 – Adjust documentation S8 – Review the Architecture	S1 – Present ATAM S2 – Present Business Drivers S3 – Present the architecture S4 – Identify architecture approaches S5 – Generate Quality Attribute Utility tree S6 – Analyze architectural approaches	S0 – Prepare for phase 2 S1 to S6 (Phase 1), with complete team S7 – Prioritizing scenarios P8 – Analyze architectural approaches P9 – Present results

Steps Included to help determining the right level of documentation

Recurring steps

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Changes to the ATAM Steps

- **S7.1 – Prepare preview of Architectural approaches**
- **Responsible:** Software Architect, Evaluation Team Leader
- **Activity:** Based on the Business Requirements create the first version of architectural approaches list
- **Target:** Identify all architectural approaches necessary to cover the business requirements

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Changes to the ATAM Steps

- S7.2 – Generate Quality Attribute Tree preview
- **Responsible:** Software Architect and Evaluation Team Leader
- **Activity:** Create the first version of the Utility Tree
- **Target:** Identify the quality attributes candidates to check visibility in the architectural documentation

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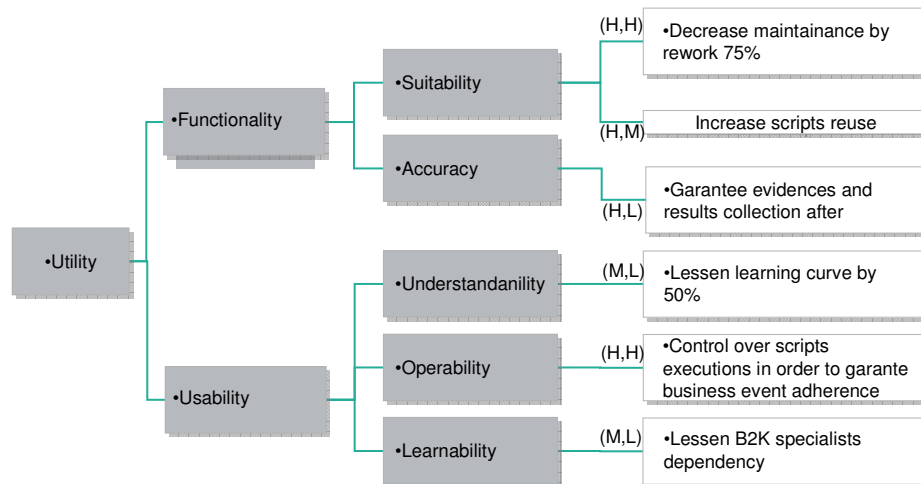
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Utility Tree Preview – 2nd Level



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Changes to the ATAM Steps

- S7.3 – Link Architecture View x Quality Attributes Candidates
- **Responsible:** Software Architect and Evaluation Team Leader
- **Activity:** Identify the architecture views necessary to support each scenario evaluation
- **Target:** Analyze if the documented architectural views are enough for an evaluation.
- Identify additional documentation to proceed with evaluation

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Changes to the ATAM Steps

- S7.4 – Adjust documentation
- **Responsible:** Software Architect
- **Activity:** Create and adjust the documentation based on step 7.3 outputs
- **Target:** Lessen big documentation gaps in the middle of an evaluation.

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Changes to the ATAM steps

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Link between
Scenario and SAD session
Included

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ATAM - Scenario 1

<i>Scenario 1</i>	Decrease scripts maintenance rework by 75%			
<i>Attribute(s) (*)</i>	Functionality – Suitability			
<i>Environment</i>	Normal Operation			
<i>Stimulus</i>	Software functionality change			
<i>Response</i>	Scripts maintenance must have minimum impact whenever a software code is changed			
<i>Architecture View(s) used to support this scenarion analysis (SAD section)</i>	P0 - S2 - Output2 - SAD Automacao Testes - Section 3.2			
<i>Architectural decision</i>	<i>Sensibility</i>	<i>Tradeoff</i>	<i>Risks</i>	<i>Non-risks</i>
The “Test case manager” process will not be changed to handle multiple objects	S1	-	R1, R2	N1, N2
Database will be changed to consolidate the object maps	S2	T1	R3	N0, N3, N4, N5

Link between
scenario and SAD
template

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Changes to the ATAM Steps

- Link between scenarios and SAD
- **Responsible:** Software Architect
- **Activity:** Create a link for each scenarios and the architectural views that support the analysis
- **Target:** Create a quick reference to the software architecture documentation.
The Software architecture documentation is updated once.

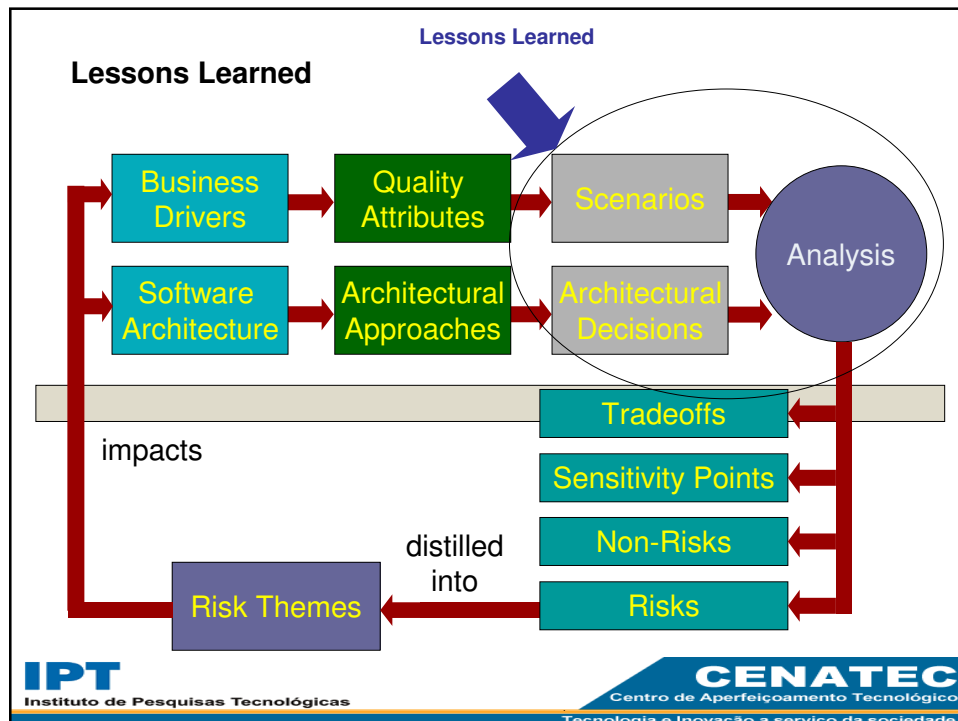
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Lessons Learned

➤ Lack of Software Architecture knowledge

Team was educated on Software Architecture Principles and practices (2 weeks training)

- *Software architecture definition*
- *Importance of software architecture*
- *Influences over Software Architecture*
- *SW architecture evaluation benefits*
- *ATAM method presented*
- *Roles of a software architect*
- *2 recycling sessions to consolidate knowledge*

Lessons Learned

➤ Preview of Architectural approaches

- *All business requirements were linked to one or more architectural approaches*
- *The links were used to test architectural views coverage*

Preview of Quality Attribute Tree

- *First List of Quality Attributes helped checking the documentation level necessary for evaluation.*

Lessons Learned

➤ Difficulties to define the right level of documentation

- Documentation was not enough for evaluation
- The company architect had to study the application architecture to complete the documentation
- ATAM steps (4, 5, 6 and 8) used to evaluate the documentation in the preparation phase.
- The documentation level was checked considering the links (Business requirements x Architectural approaches x Architectural views at SAD)
- 3 documentation reviews performed before starting the evaluation at phase 0

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Lessons Learned

➤ Difficulties to define the right level of documentation

- 1 documentation review performed at phase 1
- 1 documentation review performed at phase 2
- Depends on Team knowledge
- Links between scenarios and SAD sessions lessened the time spent to use the architecture documentation during the evaluation
- The links made the software architect explanation easier

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Lessons Learned

- **SAD Template used as**
 - *A guideline*
 - *Template for self-studying*
 - *Documentation standard*

Metrics

- Architectural documentation reviews: 3
- Scenarios identified: 41
- Scenarios prioritized: 7
- Architectural views: 4
- Risks: 17
- Non-Risks: 14
- Trade-offs: 10
- Evaluation Team: 7 people
- Effort in days:
 - Phase 0 – 1 month
 - Phase 1 – 2 days
 - Phase 2 – 5 days
 - Final Report – 1 day

Acknowledgments

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- Ary Gonçalves
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