



Value of Architecture

Linking Business Expectation & Architecture



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Agenda

- ✓ Introduction & Context
- ✓ The Challenges
- ✓ Lessons Learned

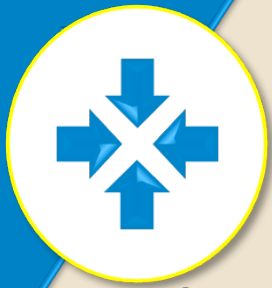
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lasa is

- a non-profit professional association
- run by architects for all IT architects
- centrally governed and locally run
- technology and vendor agnostic
- 8,000 members in 30 chapters/
communities
- 70,000 people in entire lasa network

Mission: We will make IT Architecture the most stable, well recognized profession in the world



Costco Today

- ✓ Sales \$110.2B, FY'14
 - ✓ \$164M avg sales/unit
 - ✓ 195K employees
 - ✓ >2.3M transactions/day
- ✓ Membership
 - ◉ 76M cardholders
 - ◉ 91% renewal rate (U.S. & CN)





Costco Today

671 Warehouses Worldwide

474 - U.S.

20 - Japan

88 - CN

11 - Korea

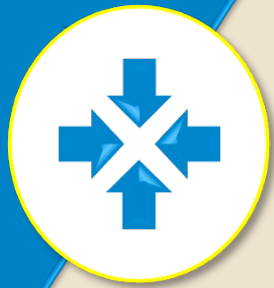
34 - Mexico

10 - Taiwan

26 - UK

7 - Australia

1 - Spain



The Technology Landscape...

- ✓ Business growing steadily
- ✓ Ambitious goals and targets
- ✓ But .. in IT ...
 - ⊙ Technical debt
 - ⊙ Integration challenges
 - ⊙ Data redundancy and inconsistency



Architects' Organization

- ✓ An EA team was formed to spearhead the effort to develop
 - ◉ Strategies, Reference architectures
 - ◉ Technology direction & choices,
 - ◉ Roadmaps, Governance
- ✓ Solution Architecture
 - ◉ Overall delivery architecture,
 - ◉ Technology leadership on project



The Quest begins...





The Evolution

- ✓ Mapping to standard practices
 - ◉ Architecture Development Method
 - ◉ Modeling Tools
 - ◉ Architecture description docs
 - ◉ ...
- ✓ Partial success
 - ◉ Directions for technology
 - ◉ Governance



However ...

✓ Challenges in

- ◉ Demonstrating value of effort and deliverables
- ◉ Correlation to business needs
- ◉ Mapping dependencies

✓ The people dimension

- ◉ Communicating architecture & strategy
- ◉ Skills dependencies



What have we learned so far ?

- ✓ Business architecture
- ✓ Just enough documentation and tools
- ✓ Traceability matters !
- ✓ Context is key in the success of architect and architecture



Business Architecture Framework

Capability Dashboard

Links to
technology
capability
building
blocks

Capabilities

What we do

Processes

How we do it

Links to
system /
applicatio
n building
blocks

Drivers/Goals
Objectives

Links to
Integration
building
blocks

Facades

Who we do it with

Entities

The things involved

Links to
logical
data
building
blocks



Architecture Repository

- ✓ Capture and connect key artifacts
 - ◉ Capabilities
 - ◉ Projects
 - ◉ Applications
 - ◉ Standards, RAs
- ✓ Solution architecture outline

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Highlighted Strategies indicated the Strategy has no associated Projects. Highlighted Projects indicate the project is currently not active.

Goal Details:

Name: Warehouse Operations - Simplify the Operation and Systems

Description:

Target Date:

Measures:

Measure	Description	Target	Actual
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Strategies to Achieving the Goal:

Strategy: Warehouse Operations - Automate Fresh Foods special order process (eliminate paper ordering)

Project: OMS Modernization Foundation and Kiosk Project

Cost: 13,600,000.00

Effect: **Application:**

No affected applications

Strategy: Warehouse Operations - Automate and streamline resale purchases

Strategy: Warehouse Operations - Automated Merchandising system

Strategy: Warehouse Operations - Combine invoicing and payment into one process (tire, optical, hearing aid etc.)

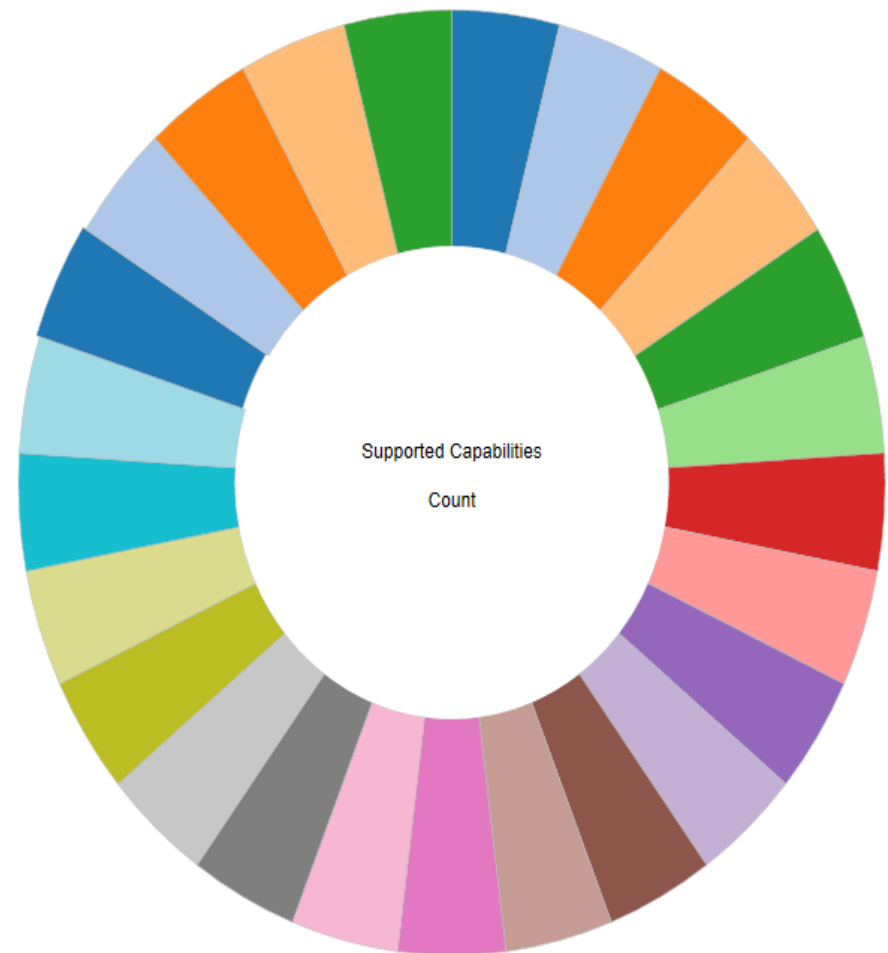
Strategy: Warehouse Operations - Create integration between cash management (MIMO) and sales audit systems



Application to Business Capabilities

All Ecommerce

- Akamai (4.00%)
- Bazaarvoice (4.00%)
- Bill Me Later (4.00%)
- BizTalk (4.00%)
- Blue Star (4.00%)
- Cenzic (4.00%)
- Connectship (4.00%)
- Coremetrics (4.00%)
- Digby (4.00%)
- Endeca (4.00%)
- Equity Edge (4.00%)
- Freedom Scientific (4.00%)
- GLCM (4.00%)
- Group 1 (4.00%)
- HitSoft (4.00%)
- Hyperion (4.00%)
- Infinium (4.00%)
- IPGeo (4.00%)
- nCipher (4.00%)
- Order Power (4.00%)
- Paymentech (4.00%)
- ReconNET (4.00%)
- Rich Relevance (4.00%)
- RichFX (4.00%)
- Sitecore (4.00%)





Communicating Architecture Choices

- ✓ ATAM modified to include
 - ◉ Business drivers
 - ◉ Comparison of architecture choices
 - ◉ Mapping architecture components to QAs
- ✓ Application for COTS
- ✓ Common vocabulary for discussion

[ATAM Example](#)

[ATAM Website](#)

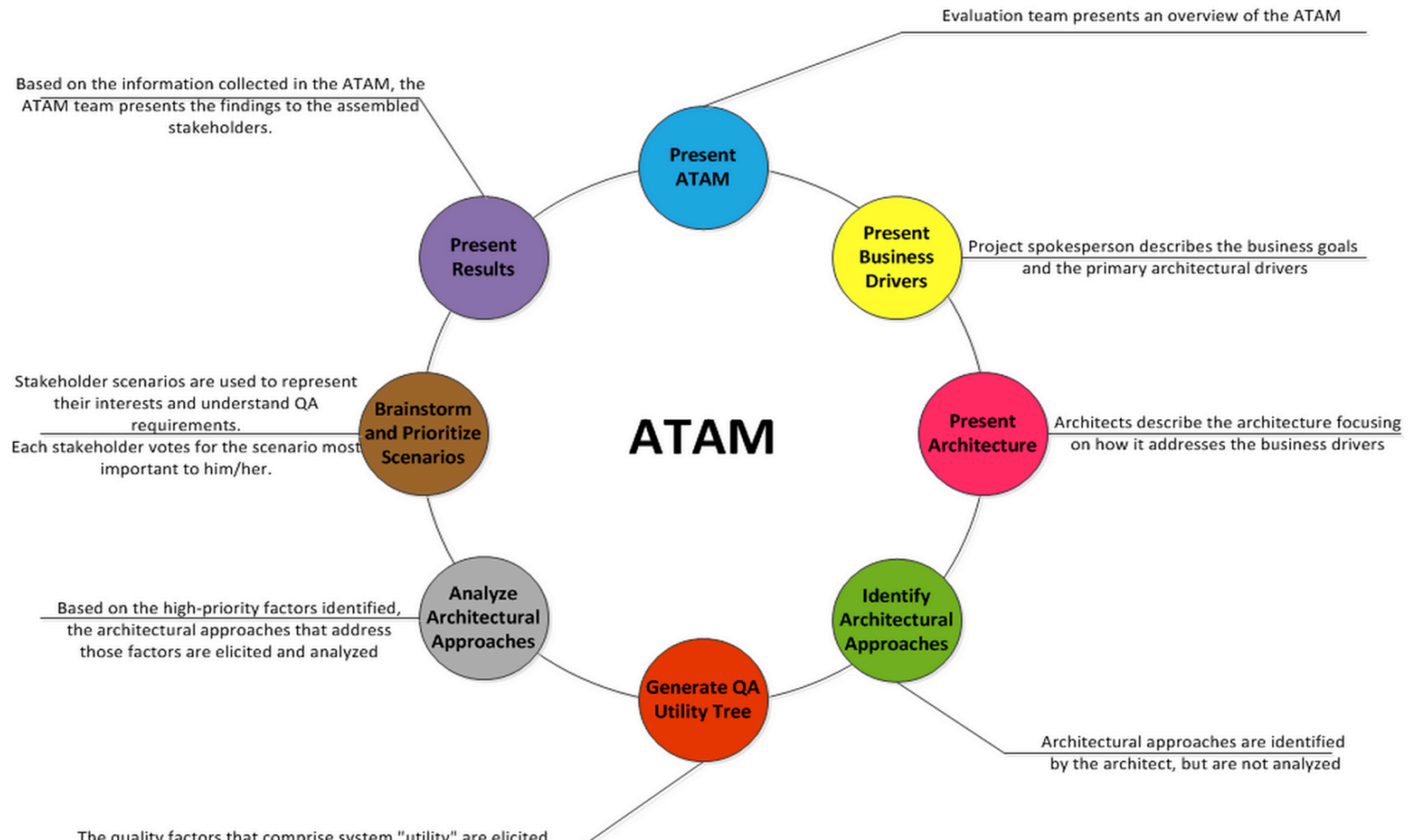


Architectural Trade-off Analysis Method

[HOME](#)[PROJECT DEFINITION](#)[UTILITY TREE GENERATION](#)[ARCHITECTURE ASSOCIATION](#)[TRADEOFF ANALYSIS](#)

Welcome to the ATAM Tool

ATAM is a method for evaluating software architectures relative to quality attribute goals. ATAM was developed by the Software Engineering Institute at **Carnegie Mellon University**. Quality attributes are one of the most important aspects of the architecture. The ATAM gets its name because it not only reveals how well an architecture satisfies particular quality goals, but it also provides insight into how those quality goals interact with each other and also trade-off against each other. Click on **Fig:ATAM Steps** to know more about Architecture Tradeoff Analysis Method.





Architectural Trade-off Analysis Method

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Construct Utility Tree

Select Project to edit:

HADR



Select

List of Attributes:

Add Custom Attribute

[Modifiability](#)
[Portability](#)
[Reusability](#)
[Integrability](#)
[Testability](#)
[Functionality](#)
[Performance](#)
[Security](#)
[Availability](#)
[Usability](#)
[Interoperability](#)
[Cost and Schedule](#)
[Marketability](#)
[Appropriateness for Organization](#)
[Conceptual Integrity](#)
[Correctness](#)
[Sensitivity](#)
[Calibrability](#)
[Dependability](#)
[Safety](#)
[Maintainability](#)
[Flexibility](#)
[Reliability](#)
[Manageability](#)
[Buildability](#)
[Configurability](#)
[Scalability](#)
[Supportability](#)
[Agility](#)

Modifiability:

Standard Definition:

The ease with which a software system can accommodate changes to its software.

Project Specific Definition:

Quality-
Attribute

Refinements

Scenarios

Utility Tree

Importance

Difficulty

Comments

Modifiability

Portability

System should be portable in 24 hrs

Ability to change print destination

Medium

High

High

High

Comments for High Complexity

--Select--

--Select--

Cost of change

Ability to change source data location

High

Medium

--Select--

--Select--

--Select--

--Select--

--Select--

--Select--

--Select--

--Select--

--Select--

--Select--

Save Attribute

Delete Attribute

Attribute **Weightage**

Modifiability

20

Ambiguity

40

Availability

30

Interoperability

10

Evaluate

Submit Weightage



Architectural Trade-off Analysis Method

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Connect Components & Attributes

Select Project:

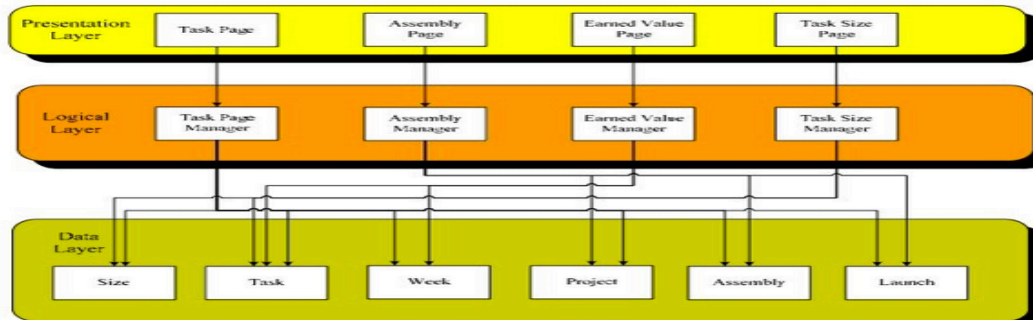
ATAM Example ▾

Select

Select the Architecture Diagram: OnePresentationLayer.JPG ▾

View

One Presentation Layer



Quality Attribute	Refinements	Scenarios	Components		Relations		Selected Components & Relations	
Modifiability	Changing User Interface	The customer wants to modify for his or her convenience without changing business logic. developers can finish the modification within 1 person/day	Commo ▾	+	Commo ▾	+	Common presentation Layer - Logic Layer (C)	-
	Adding new functionality	The customer wants the ability to add multi-team project feature. The system should easily accept it without affecting behavior of the existing components within 3 person/month The run time	Commo ▾	+	Commo ▾	+	Common presentation Layer (C) Logic Layer (C)	-

Click to Save



Time for Reflection

- ✓ Technology without context can lead to meandering
- ✓ Standards aren't everything ... but stakeholders are
- ✓ Business Architecture is critical !







Thank you !!