Value of Architecture

Linking Business Expectation & Architecture

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Iasa 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 Iasa 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.
88 - CN
34 - Mexico
26 - UK
20 - Japan
11 - Korea
10 - Taiwan
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
Architecture Repository

- Capture and connect key artifacts
  - Capabilities
  - Projects
  - Applications
  - Standards, RAs

- Solution architecture outline
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:

<table>
<thead>
<tr>
<th>Measure</th>
<th>Description</th>
<th>Target</th>
<th>Actual</th>
</tr>
</thead>
</table>

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
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]
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.

Evaluation team presents an overview of the ATAM

Present ATAM

Present Results

Present Business Drivers

Project spokesperson describes the business goals and the primary architectural drivers

ATAM

Brainstorm and Prioritize Scenarios

Each stakeholder votes for the scenario most important to him/her.

Stakeholder scenarios are used to represent their interests and understand QA requirements.

Based on the high-priority factors identified, the architectural approaches that address those factors are elicited and analyzed.

Analyze Architectural Approaches

The quality factors that comprise system “utility” are elicited.

Generate QA Utility Tree

Identify Architectural Approaches

Architects describe the architecture focusing on how it addresses the business drivers

Present Architecture

Architectural approaches are identified by the architect, but are not analyzed.
### Construct Utility Tree

**List of Attributes:**
- Add Custom Attribute

**Modifiability:**
- Standard Definition: The ease with which a software system can accommodate changes to its software.
- Project Specific Definition: 

<table>
<thead>
<tr>
<th>Quality-Attribute</th>
<th>Refinements</th>
<th>Scenarios</th>
<th>Importance</th>
<th>Difficulty</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modifiability</td>
<td>Portability</td>
<td>System should be portable in 24 hrs</td>
<td>Medium</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ability to change print destination</td>
<td>High</td>
<td>High</td>
<td>Comments for High Complexity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cost of change</td>
<td>High</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ability to change source data location</td>
<td>High</td>
<td>High</td>
<td></td>
</tr>
</tbody>
</table>

**Attribute Weightage**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Weightage</th>
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</thead>
<tbody>
<tr>
<td>Modifiability</td>
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<tr>
<td>Ambiguity</td>
<td>40</td>
</tr>
<tr>
<td>Availability</td>
<td>30</td>
</tr>
<tr>
<td>Interoperability</td>
<td>10</td>
</tr>
</tbody>
</table>
The customer wants to modify for his or her convenience without changing business logic, developers can finish the modification within 1 person/day.

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

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 !!