Enterprise Architecture for Decision Support
Connecting Data to Decisions

with System Architect

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Overview

• Objective
• Scenario
• Problem
• Solution
• Results
• Questions?
Objective

- Informed **decisions** supported by **data** are crucial for the success of any enterprise now or in the future.

- Offer some insight into ways of delivering the information to where it's relevant and enable **enterprise architecture** to be a critical tool for decision support.
Scenario: Context

• Provide an unbiased, abstract view of the enterprise through architectural information and processes.

• This unbiased source of architectural information can allow users to make decisions on the operational functions they wish to support thus allowing the business and its needs to drive the technology not the inverse.

• The business world is a competitive knowledge-rich environment in which managers make many decisions, ranging from the simple to the complex, about what to do with their organizations' resources.
Scenario: Context

Most business decisions have data dependencies that are also captured as static snapshots in enterprise architecture products.

• It is equally probable that decisions are being made without considering the "whole" effect of the decision on the enterprise.

• Every one of these decisions involves the use of data and requires the use of enterprise architecture to support informed decisions.

• You must go beyond static artifacts if you want an enterprise architecture that delivers decisions based on relevant data.
Problem

- Enterprise architecture and the resultant content are neither visible nor usable to most people within any organization.
- The majority of enterprise architecture content is trapped in the hands of information technologists and not in the hands of the business.
- Information is not available to the business enterprise to be used as a critical tool for decision support.
- Early adopters of architecture often use tools that only provide graphic images and have no ability to dynamically link data and provide real time information to appropriate stakeholders.
- As a result the architecture offers little “value” to potential users and is ultimately relegated to “shelf-ware”.
Solution – Primary Mechanisms

• Three primary mechanisms that enterprise architects need to be successful.

1. **Framework** = static taxonomy in multiple dimensions that defines ALL elements of the architecture and its relationships.

2. **Methodology** = the body of methods, rules, and procedures employed by the architectural discipline. Methods include:
   1. Architectural framework **population** (*scope, collect, develop*)
   2. Architectural information **analysis**
   3. Architectural results **delivery**
   4. Architectural **governance** (...and inculcation)

3. **Environment** = multiple tools that enable the methodology supported by the underlying framework.
1. Framework

- Core interrogative pronouns used in many professions
- What, How, Where, Who, When, Why

<table>
<thead>
<tr>
<th></th>
<th>What</th>
<th>How</th>
<th>Where</th>
<th>Who</th>
<th>When</th>
<th>Why</th>
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<td>Substance</td>
<td>Causality</td>
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<td>Human</td>
<td>Time</td>
<td>Purpose</td>
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<td>process structure</td>
<td>process rule model</td>
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<tr>
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<td>process rule design</td>
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<td>(atomic)</td>
<td>database</td>
<td>code + OS</td>
<td>computer</td>
<td>role</td>
<td>availability</td>
<td>function</td>
</tr>
</tbody>
</table>
2. Methodology

Scope

Collect

Governance

Deliver

Analyze

Develop
3. Environment

- Executive Dashboard and Reporting
  - SA Publisher, SA HTML Generator, MS SharePoint

- Requirements, Configuration and Workflow
  - Telelogic DOORS, MS SharePoint, HTML

- Business and Systems Modeling & Simulation
  - Telelogic System Architect, Telelogic Simulator

- Data Integration, Federation & Storage
  - Elements Repository, HTML, MS Terminal Services, Oracle Enterprise Manager

- Extract, Transform, Load (ETL)
  - ETL Tools, HTML, MS Access, Oracle Enterprise Manager

Finance data

Data Stores
Solution - Context

• Enterprise architecture must consist of more than static graphic product(s).

• It must be “operationalized” through data and analysis to provide scope, context and guidance for a company's direction.

• **Value** lies in reuse and collaboration across stakeholders, disciplines and teams both internal and external to the enterprise.

• Enterprise architecture content must further be communicated to each relevant stakeholder within the enterprise in an understandable form for that group.
Solution - Overall

• Answering the questions of the business enterprise with the architecture and delivering the right message to the right people to connect data to decisions.

• For our example we will focus on two methods

Population  Delivery
Solution - Population

• To successfully **populate** the architecture requires several mechanisms:
  
  **Scope**
  - Frame the questions.
  - Define the measures.
  
  **Collect**
  - Collect data to support required artifacts.
  - Align the architecture to the questions.
  
  **Develop**
  - Determine most efficient method(s) for development
  - Develop only the relevant architecture.
Example

• Company Inno-VA-trZ has just been tasked with looking at a new airline check-in process (FASTPASS) along with all its systems and accompanying ways of doing business.

• There currently exists a large number of systems amongst a host of other overlapping capabilities.

• The company “C-level” team have stated they have 4 primary goals they want the team to accomplish.

• The enterprise architecture team has been tasked with accomplishing the goals and of course if possible demonstrating the dreaded “quick win”.

Scope - Frame the Questions

• This doesn’t mean to run over to your local X Mart and grab a cheap frame, print out a list of questions and frame it.

• Well maybe not a bad idea AFTER you have discussed with the stakeholders and captured the scope and purpose for the architecture effort.

These two parameters provide the initial “frame” for the questions that the architecture can answer.
## Scope – Define the Purpose

- Let's assume the goals set for the effort are as follows:

<table>
<thead>
<tr>
<th>Purpose stated in 4 goals.</th>
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<table>
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<th>Scope</th>
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<td>3. Reduce all check-in processes across the enterprise</td>
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<td>4. Document and define the future state of the enterprise</td>
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- None of these goals can be achieved without:
  - succinct measurable dimensions of success
  - further refinement of the goal(s) into measurable objective(s)
Let’s focus on the third goal and restate it into a question that can be answered with the architecture.

**Scope**

1. Capture the IT portfolio and get it under configuration management
2. Document the transitional architecture to enable reduction of duplicative systems
3. Reduce all check-in processes across the enterprise
4. Document and define the future state of the enterprise

Restated as an example **objective** question:

– How do we reduce the process time required to check-in a passenger in our enterprise?
Scope - Define the Measures

- How do we reduce the **process** time required to check-in a passenger in our enterprise?
  - Increase the Efficiency or Effectiveness (human process)?
    - Efficiency is focused on **Process** (productivity metric)
      - **For the sake of simplicity our example will address time for each process** as a measure of productivity
    - Effectiveness is focused on **Output** (quality metric)
      - Future efforts could focus on satisfaction survey data (*somewhat subjective* but still critical to quality)
  - Reduce the number of systems that require duplicate data entry?
  - Reduce the number of times users interact with the data?
**Align Architecture to Questions**

- **How** human (business) activities are being performed
- **When** and **Who** accomplishes them

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Collect Data to Support Required Artifacts

- Data extraction tools can also be used to “harvest” any viable data that can be used to populate other relevant elements.
  - Check-in time data could be captured from terminals
  - Boarding data could be captured from terminals
Determine Development Method(s)

- BPMN (Business Process Modeling Notation)
- Business Process Modeling
- Either method supports time, periodicity and frequency so that time data variables can be added to support analysis
- Other data can be added as required to answer questions

![Diagram](image-url)
Develop Relevant Architecture

- Use Telelogic System Architect (SA) tool to graphically model the architecture.
Develop – Web-Based Access with SAXT
Solution - Delivery

- Finished graphic generated in a variety of formats can be accomplished with reporting features in System Architect:
  - HTML output
  - Word Document
  - Detailed graphic diagrams
  - Database DDL
- SAXT provides real-time web-based access
- SA Publisher provides:
  - Dashboard views
  - Pie Charts, Bar Charts, “Heat Maps”
  - As-Is <> To-Be Comparisons
Deliver the Results
Reports from System Architect (MS Word)

Passenger Check-in

TSA (Pool Lane)
Description: Transportation Security Administration personnel

Process Carry on Luggage (Process)
Description: Process Carry on Luggage as normal

X-ray Carry on Luggage (Process)
Description: X-ray Carry on Luggage and loose articles

Verify Passenger and Boarding Pass (Process)
Description: Verify Passenger and Boarding Pass meet identification provided

Hand Inspect Carry on Luggage (Process)
Description: Hand Inspect Carry on Luggage in accordance with regulations

Questionable Item? (Gateway)
Description: Is item questionably dangerous or otherwise on the list

Airline (Pool Lane)
Description: Airline personnel that assist passenger in boarding

Verify Passenger and Flight (Process)
Description: Verify Passenger and Flight by airline personnel

Issue Boarding Pass (Process)
Description: Issue Boarding Pass if not already available

Collect Checked Baggage (Process)
Description: Collect Checked Baggage and verify within limits

Passenger (Pool Lane)
Description: Airline passenger authorized to travel in the area

Check-in Complete (Event)
Event Type: Unconnected Event

Passenger Check-in with FASTPASS

TSA (Pool Lane)
Description: Transportation Security Administration personnel

Process FastPass Baggage (Process)
Description: Perform accelerated FastPass Baggage for FP members

Perform FastPass Screening (Process)
Description: Perform accelerated FastPass Screening for FP members

Hand Inspect Carry on Luggage (Process)
Description: Hand Inspect Carry on Luggage in accordance with regulations

Verify Passenger and Boarding Pass (Process)
Description: Verify Passenger and Boarding Pass meet identification provided

X-ray Carry on Luggage (Process)
Description: X-ray Carry on Luggage and loose articles

Process Carry on Luggage (Process)
Description: Process Carry on Luggage as normal

Questionable Item? (Gateway)
Description: Is item questionably dangerous or otherwise on the list

Airline (Pool Lane)
Description: Airline personnel that assist passenger in boarding

Determine FastPass Status (Process)
Description: Is Passenger a FastPass member

Collect Checked Baggage (Process)
Description: Collect Checked Baggage and verify within limits

Issue Boarding Pass (Process)
Description: Issue Boarding Pass if not already available

Verify Passenger and Flight (Process)
Description: Verify Passenger and Flight by airline personnel

Passenger (Pool Lane)
Description: Airline passenger authorized to travel in the area

Check-in Complete (Event)
Event Type: Unconnected Event
Deliver the Results
Reports from database (3rd Party)

• Passenger **time** to check-in

<table>
<thead>
<tr>
<th>no.</th>
<th>Name</th>
<th>Time</th>
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<tbody>
<tr>
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<tr>
<td>1</td>
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<tr>
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<tr>
<td>1</td>
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</table>

• Average time of 78 minutes

• Passenger **time** to check-in with FASTPASS

<table>
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</table>

• Average time of 45 minutes
• Time reduction of 57%
Deliver the Results

Process Model Variant 1 (as-is)

Process describes HOW

Swimlanes describes WHO

Process Model Variant 2 (to-be)

Analysis for Duplicate Processes
Deliver - As-Is <> To-Be Analysis
Deliver - As-Is <> To-Be Analysis
Deliver - As-Is <> To-Be Analysis
Deliver the Results
Publish to Web (SA Publisher)

- Check-in with Airline
- Collect Checked Baggage
- Enter Security Screening Area
- Issue Boarding Pass
- Process Carry on Luggage
- Verify Passenger and Boarding Pass
- Verify Passenger and Flight
- X-ray Carry on Luggage
- Determine FastPass Status
- Enter FastPass Screening Area
- Exit FastPass Screening Area
- Perform FastPass Screening

- Check-in with Airline
- Collect Checked Baggage
- Enter Security Screening Area
- Issue Boarding Pass
- Prepare for X-ray Process
- Process Carry on Luggage
- Verify Passenger and Boarding Pass
- Verify Passenger and Flight
- Walk through X-ray
- X-ray Carry on Luggage
Results

Informed decisions supported by data are crucial for the success of any enterprise of the future.
Frame the Questions?

QUESTIONS
Points of Contact

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Solution: Environment

• These applications bound together in an environment coupled with business processes and monitored by a governance body enable the collaborative development and integration of architecture.

• The environment was centered around five core functions:
  – Extract, Transform, Load (ETL)
  – Data Integration, Federation & Storage
  – Business and Systems Modeling & Simulation
  – Requirements, Configuration and Workflow
  – Executive Dashboard and Reporting
Solution: Tools

• System Architect™
• System Architect Encyclopedia Manager™
• System Architect Simulator II™
• System Architect Publisher™
• System Architect Compare™
• SAXT
• DOORS (Dynamic Object Oriented Requirements System)
• Microsoft Terminal Services
• Oracle 10 and Oracle Enterprise Manager
• Microsoft SQL Server
• Microsoft Access
• Microsoft SharePoint
• Business Objects Crystal Reports