Visualization of Enterprise Architecture Model Evolution Based on an Example in the Consumer Goods Industry

Master Thesis Final Presentation

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Agenda

• Introduction
• Research Questions
• Integration Approach
• Technical Approach
• Results
• Future Improvement
• Conclusion
INTRODUCTION

Bosch and Siemens Home Appliances (BSH)

- BSH is a well-known home appliances company
  - More than 45000 (by 2011) employees with 14 different brands operating in 40 countries.
  - Has huge amount of technology and systems and complex environment
  - Has Enterprise Architecture (EA) management to control and manage their environment

- BSH IT has an EA Management system in place

- Decide to have a collaboration by master thesis with the goal to see if:
  - TUM research could improve BSH IT EA management and visualization
### Initial State

<table>
<thead>
<tr>
<th>ATLAS</th>
<th>TRICIA</th>
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<tr>
<td>• EA Management took place in BSH since 2006</td>
<td>• Sebis developed a cutting-edge tool named “Tricia” which may offer new approaches and visualization possibilities</td>
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<td>• Since 2007 BSH IT is using a system called Atlas</td>
<td>• Enterprise 2.0 product with many different features and development areas</td>
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| • It is very good product with a well mature maintenance process.  
  • Filled up by the product managers  
  • It is used to represent and making reports about the IT-Systems of BSH  
  • Used to visualize the reports and represent the current status of the enterprise | |

- However the Atlas system has some limitations concerning comparison of historical and actual data  
- TUM Research together with the tool Tricia may have the potential to improve BSH EA approach
Research Questions

- What are the stakeholder requirements for visual EA model analysis and evaluation?
  - Approach
    - Initial interview
    - Constant observations and interviews inside the enterprise

- Which (EA) visualizations can effectively show temporal aspects of (EA) models?
  - Approach
    - Comprehensive literature research
    - Mapping of research results to requirement
    - Prototype implementations, evaluated with real business data

- How to handle previous states of EA in a model repository and visualize them?
  - Approach
    - Enhancement of Tricia to be able to
      - Handle different states of an EA models and
      - Visualize different EA models

- How to combine the existing Atlas solution with Tricia?
BSH Logical Integration Approach

- There will be a new approach in BSH IT
  - BSH will use both systems at the same time for different purposes
  - Atlas → Data maintenance and standard visualizations
  - Tricia → Historic data comparison by visualizations
Technical Approach

Application Database

Admins

Administrator

Import Definition

Several Imports

2011

2012

2013

Tricia Repository

EA Model

Update

Create

Historical Visualizations

User

Delta Analysis

Based on data schema
Data Import

- Tricia tool enables users to have an automatic transfer of their data.
  - Mapping file prepared to transfer entities and relations from Atlas to Tricia
  - Modification of import mechanism to be able to deal with regularly imports
    - Writable Copy
    - Versionable Mixin

ATLAS DB → XML File according to DB

TRICIA persistence DB

TRICIA persistence DB

TRICIA

Tricia parses XML

Save data to persistence DB
Version Retrieving

01.01.2009 - 21.09.2013
Constant changes other than import

01.01.2009 Import
01.01.2010 Import
01.01.2011 Import
01.01.2012 Import
01.01.2013 Import
01.01.2014 Future Import

01.01.2009
01.01.2010
01.01.2011
01.01.2012
01.01.2013
01.01.2014

Today

Query(…)
Delta Analysis
Retrieving Version

01.01.2011 Desired Version Date

01.01.2012 Desired Version Date

Query(…)
Delta Analysis
Retrieving Version
Visualizations

- There are two types of visualizations prepared in the context of master thesis
  - Visualizations (Historical)
  - Implemented Visualizations
  - Conceptual Visualizations

- Mostly relies on the real enterprise data

- Result of practical evaluation

- Using well known visualization types improves understanding of content significantly
Conceptualized Visualization -1
RESULTS

- All the objectives that were determined at the beginning has accomplished and evaluated.
Further Improvements

- Implementation of conceptualized visualizations
- Performance Improvements for Import mechanism
- Design of the current visualization can be improved
- Documentation of the Tricia should be definitely improved for business perspectives
- Different states can be stored in EA repository
THANK YOU FOR YOUR ATTENTION!

QUESTIONS & COMMENTS?
Backup Slides
BSH Data Model

- **IT Product**
  - 1
  - 1..* Variant IT Product

- **Country**
  - *
  - 1
  - * Location

- **Region**
  - 1..* 1

- **Process**
  - *

- **System Component**
  - *

- **Technological Component**
  - *

- **Information Object**
  - *
Data import should ensure regular data transfer

- Starts the import mechanism
- Check for database credentials
  - DB Connection is Correct?
    - NO
    - Start mapping Persistent Entity based on XML Schema
      - Entity Exists before
        - YES
          - Create Writable Copy of Persistent Entity
        - NO
          - Create Persistent Entity with ID
    - YES
      - Update the Persistent Entity
      - Persist Entity to Persistence Layer
        - For each Persistent Entity not Exists in this Import
          - Delete Persistent Entity