

Master Thesis: ESB Based Automated EA Documentation

Final presentation

Student:	Sebastian Grunow
Supervisor:	Prof. Pontus Johnson
Advisors:	Markus Buschle (KTH) Sascha Roth (TU München)

Problem and Objective

Methodology

Results

Conclusion and Outlook

Manual EA Documentation cannot cope with future requirements.

Current Situation & Future Trend

- Increasing information volume
- Increasing requirements on the companies' agility due to shorter product and market cycles (Wilke, 1998)
- Increasing importance of EA as means of decision-making => quality requirements have become more important

Current Methods for EA Documentation

- Maintenance and collection of EA data largely determined by manual processes sometime partly automated (Winter, 2010)
- Creation of EA models often remains manual (Buckl, 2007)

Problems

- Cost-intensive and time-consuming processes
- Mismatch between realized and desired information coverage (Farwick, 2011)
- Fulfilment of the quality requirements is problematic => immediate effect on decision quality

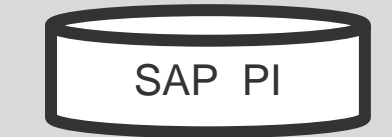
(Partly) automated EA Documentation based on SAP PI as a possible solution...

Objective target

To what extent is an automated and tool-aided approach for EA documentation using SAP PI as an information source possible?

Process from requirements' perspective

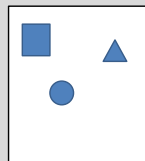
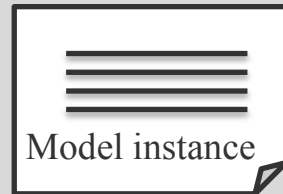
1



2



3



Research questions

- What are the requirements on such a process?
- Which EA information can be extracted from an SAP PI System?
- How good is the data quality and its effect on the models created?
- Which decision problems /concerns can be appropriately supported by the provided information?
- How can the information be visualized in order to optimally support the decision problems defined?

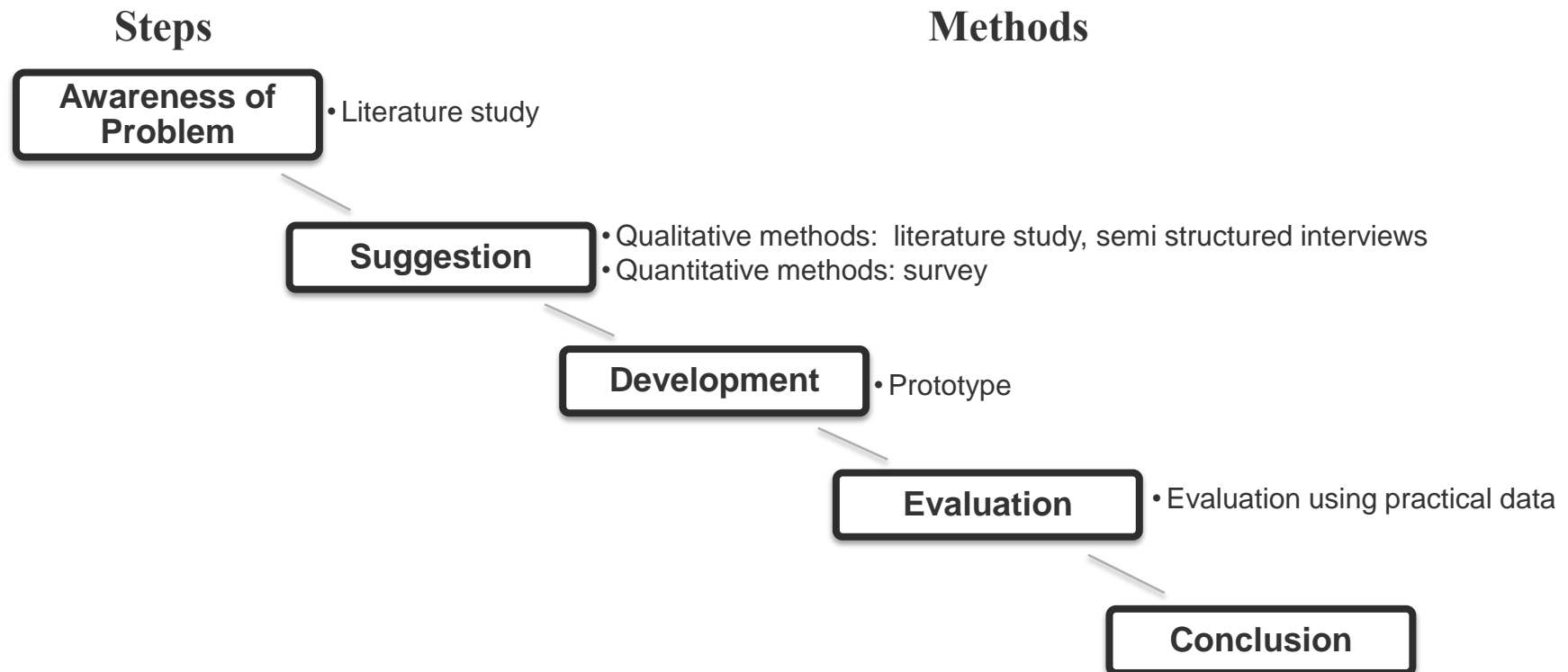
Problem and Objective

Methodology

Results

Conclusion and Outlook

For the development a design science research approach was used...



Problem and Objective

Methodology

Results

Conclusion and Outlook

1. Data export from SAP PI and transformation into an intermediate format

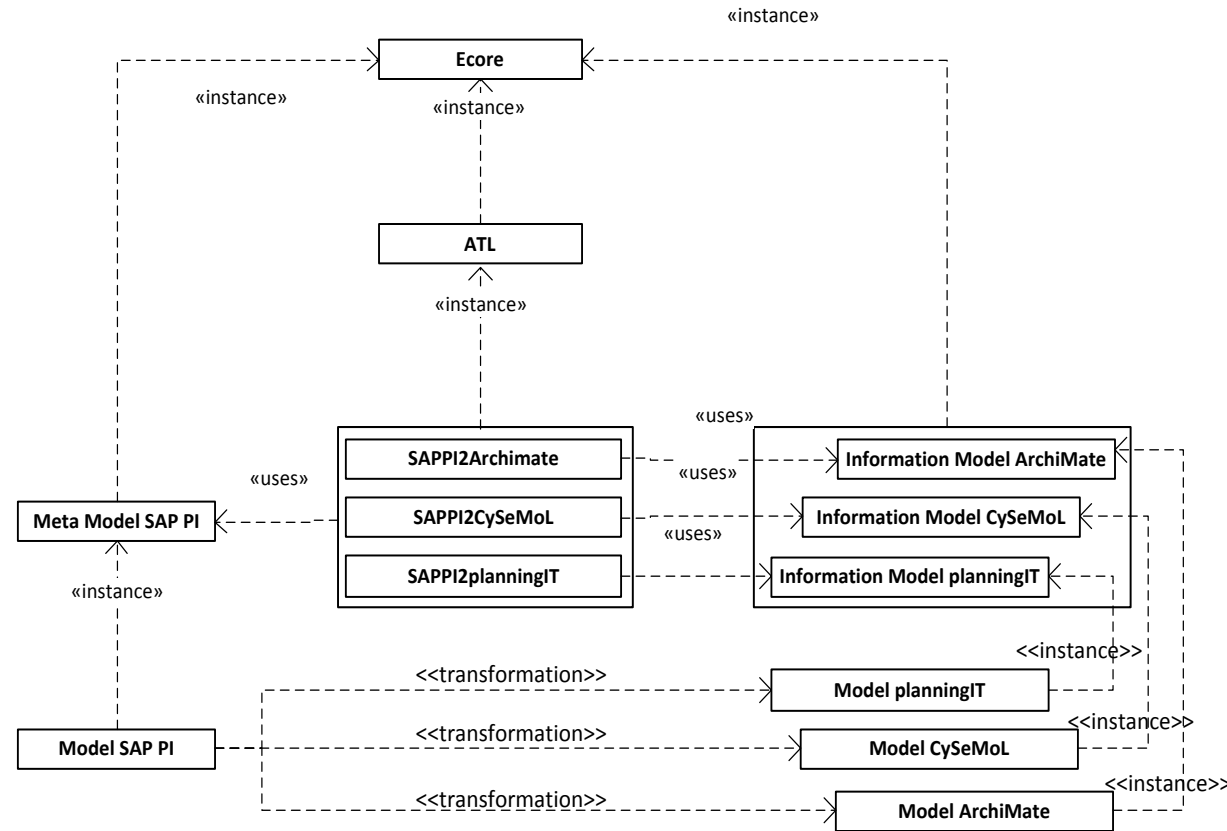
Data export

Description



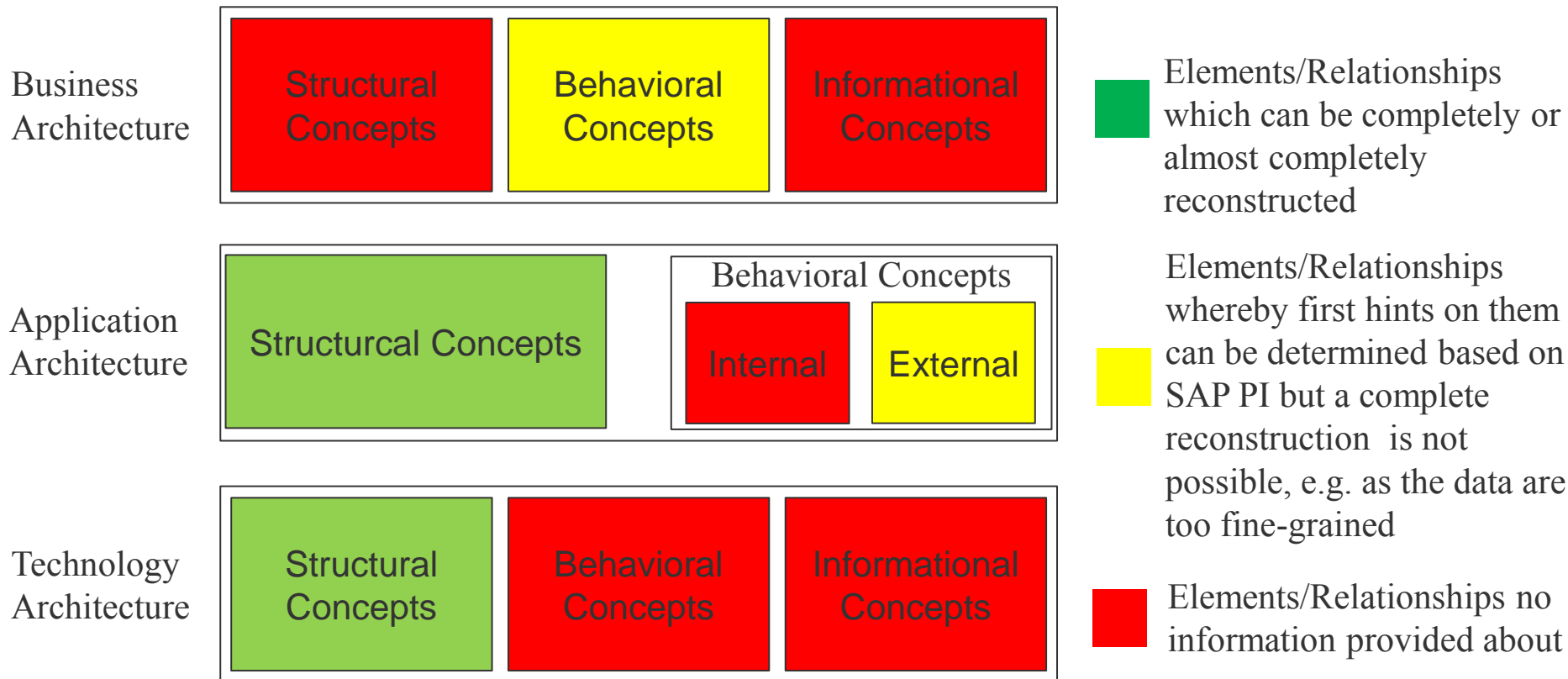
- Data export process is complex
 - From today's perspective different export technologies are necessary
 - The different components provide different information related to each other
- ⇒ Development of an intermediate format merging and consolidating the data
- ⇒ Easy further processing
 - ⇒ Independence of the export processes from the model-creation processes
 - ⇒ Easy extension of the export processes

2. Transformation of the intermediate format into an EA information model instance



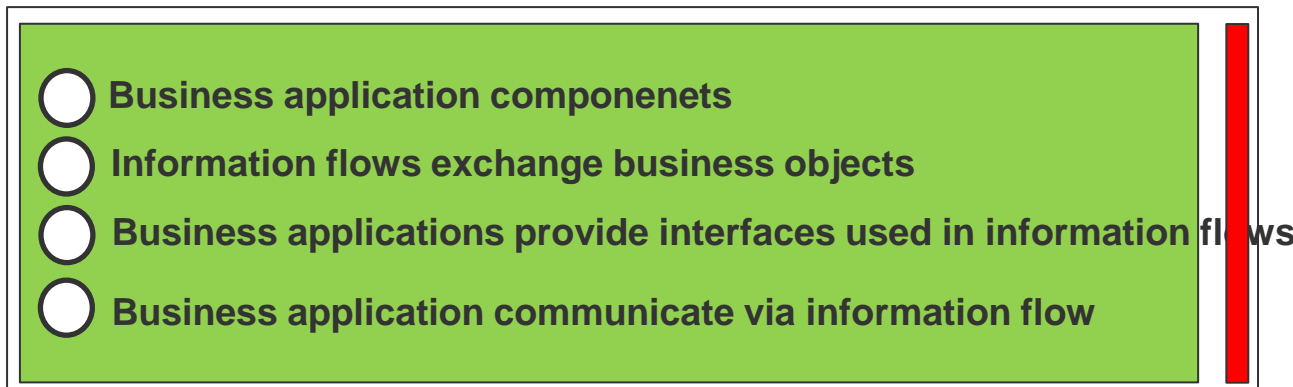
- Discussion of the EA information coverage based on several information models (general, specific, practice-relevant)
- Usage of Ecore for formal model description
- Model2Model transformation using ATL which best meets the requirements

EA information coverage using Archimate as an example



The color of the concepts corresponds to the category, most elements belongs to.

3. Assessment of the decision support provided by SAP PI based on the information coverage of EA concerns



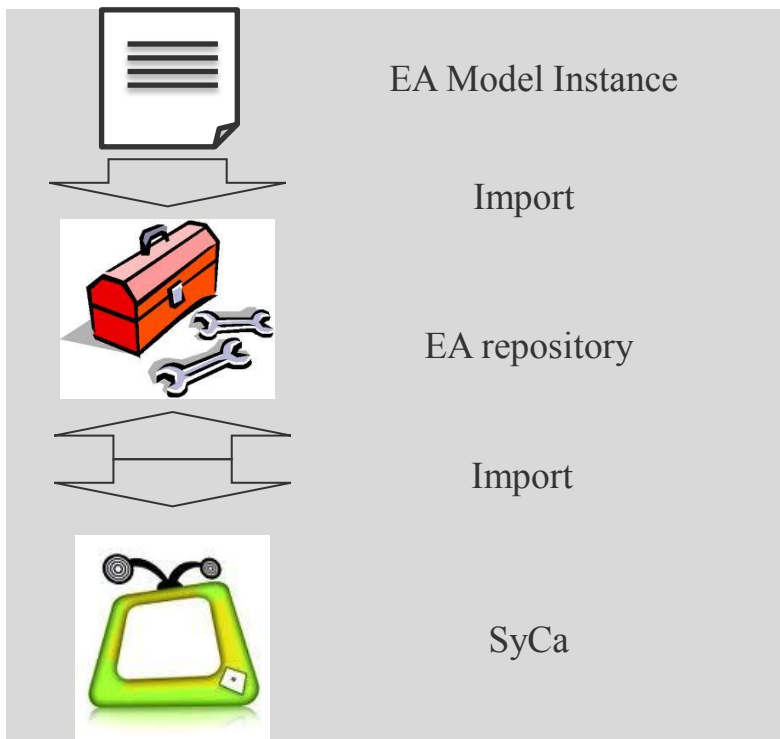
Business application using infrastructure



- Comparison of concerns' information demand with information provided by SAP PI
- Good support in the areas of
 - Application communication
 - Information flows and objects exchanged
 - Used/provided interfaces

Using hybrid wiki as a repository to store the data and Syca to visualize them suitably

Visualization process



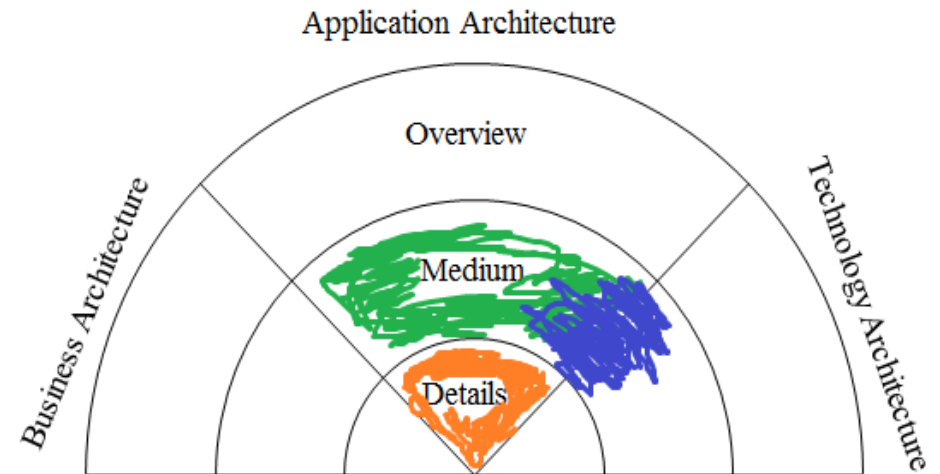
Description

- Import of the EA model instance into Hybrid Wiki
- Usage of Archimate as the underlying information model (with a few adaptations)
- Automated visualization using SyCa

Development of viewpoints according to the concerns identified

- Development of several viewpoints to visualize the data appropriately
- Requirements
 - Uniform design
 - Information volume=> appropriate handling of complexity with a particular focus on interfaces, information flows and objects exchanged (in a new way)
 - Legibility
- Consideration of SAP PI specifics reflected in the views (e.g. business points)
- Fomal description of viewpoints in SyCa

3 viewpoints were developed focussing on different



- Application-Communication-Viewpoint
- Application-Deployment-Viewpoint
- Information-Interface-Viewpoint

Agenda

Problem and Objective

Methodology

Results

Conclusion and Outlook

Conceptual development of an automated tool-aided EA documentation process based on SAP PI

Partly, prototypical implementation

Open Points

- Consideration of dynamic data
- Definition of the surrounding organizational structure
- Expansion of the data collection process by new information sources

Thank you for your attention.



Questions? Suggestions?

Buckl, S.; Ernst, A.; Lankes, J.; Schweda, C.; Wittenburg, A. (2007): Generating Visualizations of Enterprise Architectures using Model Transformations. In: 2nd International Workshop on Enterprise Modelling and Informations Systems Architectures - Concepts and Applications

Winter, R., Buckl, S., Matthes, F., and Schweda, C. (2010). Investigating the state-of-the-art in enterprise architecture management methods in literature and practice : MCIS2010 Proceedings

Mayerhofer, R. (2007): Introduction to SAP Business One: SAP PRESS.

Hayen, R. (2006): SAP R/3 Enterprise Software: An Introduction: Mcgraw Hill Book Co.

Stumpe, J., Orb, J. (2005): SAP Exchange Infrastructure: SAP PRESS.

Krimmel, M., Orb, J. (2009): SAP NetWeaver Process Integration. Second: SAP PRESS.

Nicolescu, V., Funk, B., Niemeyer, P., Heiler, M., Wittges, H. (2009): Praxishandbuch SAP NetWeaver PI - Entwicklung. Second: SAP PRESS.

The Open Group (2009): ArchiMate® 1.0 Specification: Technical Standard - The Open Group Series: Haren Van Publishing.

Farwick, M., Agreiter, B., Ryll, S., Voges, K., Hanschke, I., Brey, R. (2011) *Requirements for automated Enterprise Architecture Model Maintenance*. In: 13th International Conference on Enterprise Information Systems (ICEIS), Beijing.

Lankhorst, M. (2009): Enterprise Architecture at Work: Modelling, Communication and Analysis: Springer, Berlin

Wittenburg, A. (2007): Softwarekartographie: Modelle und Methoden zur systematischen Visualisierung von Anwendungslandschaften. Online verfügbar unter <http://books.google.de/books?id=2WOGNwAACAAJ>.

The overall data quality is high with some exceptions...

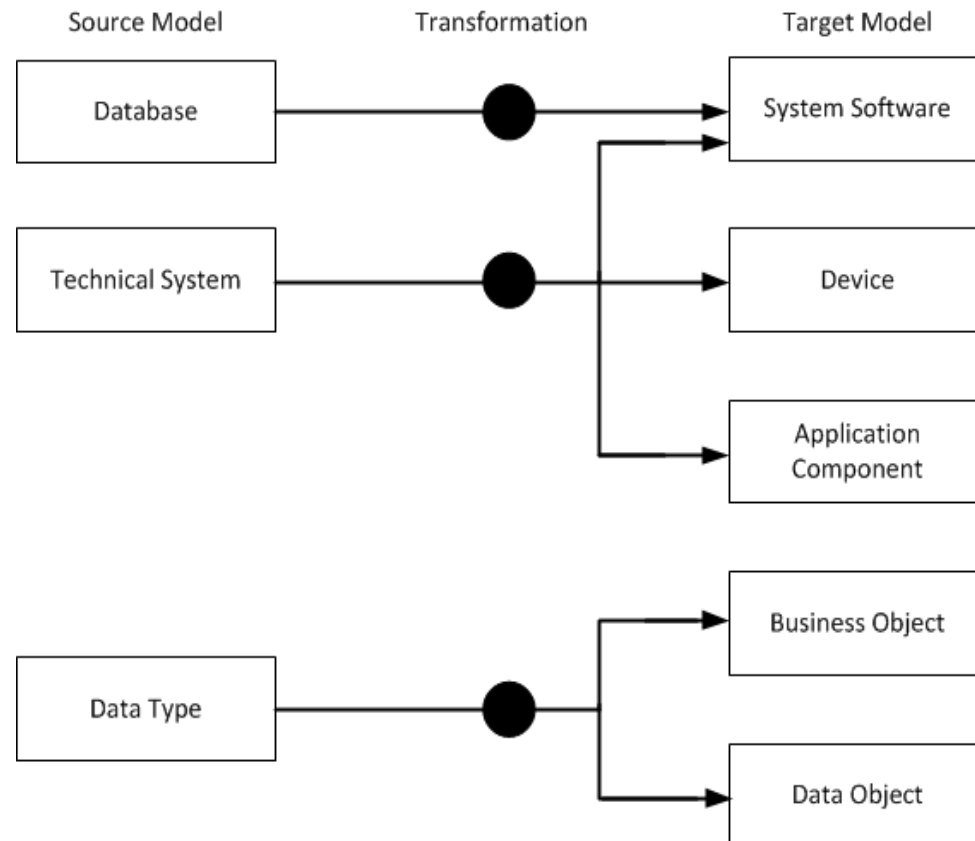
	SLD	Enterprise Service Repository	Integration Builder
Completeness**	Green	Green	Green
Free-of-Error**	Green	Green	Green
Actuality**	Yellow	Yellow	Yellow
Formal and consistent representation**	Green	Green	Green

- Focus on four quality dimensions
- Overall quality of the data is high with some exceptions
- The average deletion time in practice is higher than the desired actuality time*

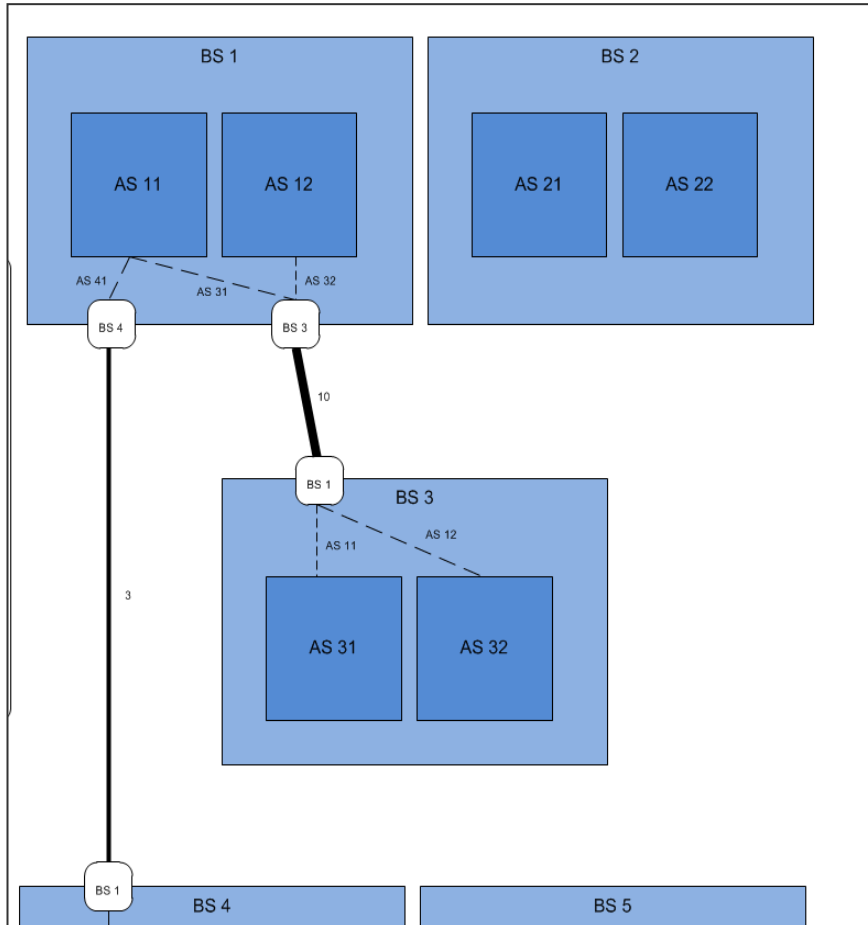
* Within a survey conducted by Farwick et al. (Farwick, 2011) the respondents reported that an actuality within weeks (48%) or up to six months (31%) is appropriate. In contrast, the survey conducted within the thesis shows that in average it takes 10 months to delete an element.

** Within the thesis, a survey was conducted as an online pool aimed at evaluating the quality of SAP PI data in practice in terms of completeness, correctness and actuality. The survey was opened within 45 days. 45 people started the survey, 17 fully completed it.

Example transformation rules



Application-Communication Viewpoint



- Layered drawing of computer systems using Sugiyama algorithm
- Only application groups are displayed (=business systems)
- 2 abstraction levels:
 - Cross-relationships are grouped in order to highlight cross-company and cross-system relationships
 - Application group associations are also visible but at second glance