

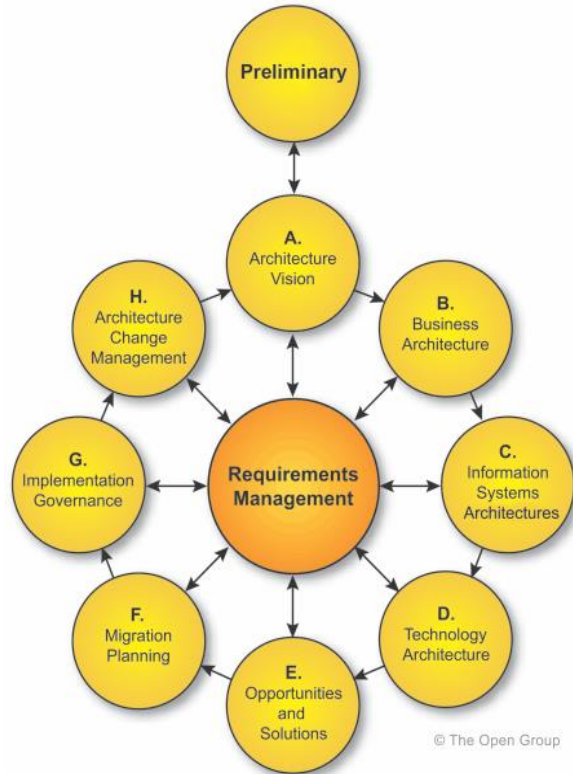
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Developping a Semantic Mapping between TOGAF and BSI-IT-Grundschutz

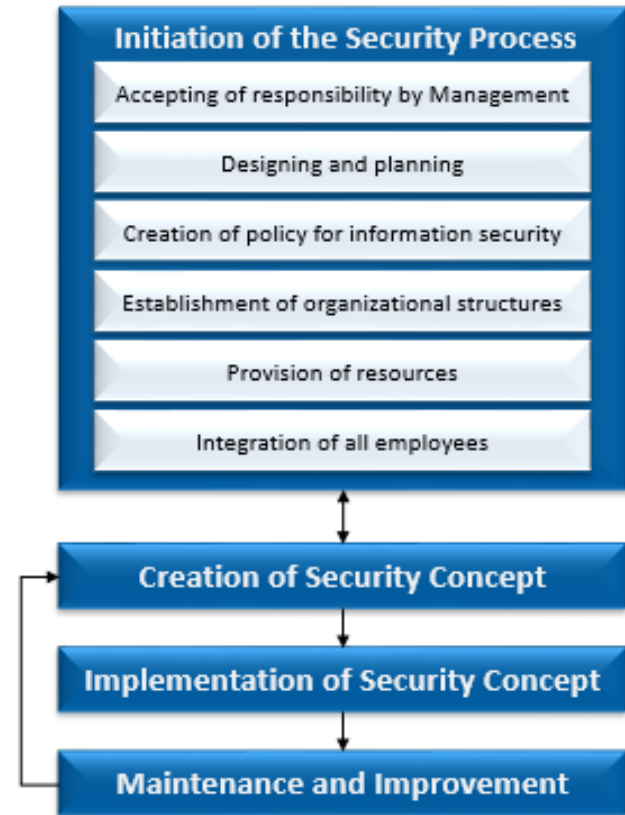
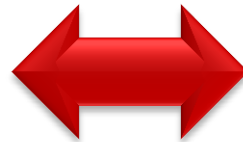
Background

- Enterprise Architecture (EA)
- Enterprise Architecture Framework (EAF)
 - Zachman Framework, FEA, TOGAF
- Incorporation of Information Security into EA
- Information Security Management (ISM) Standards
 - ISO series, BSI series

TOGAF & BSI-IT-Grundschatz

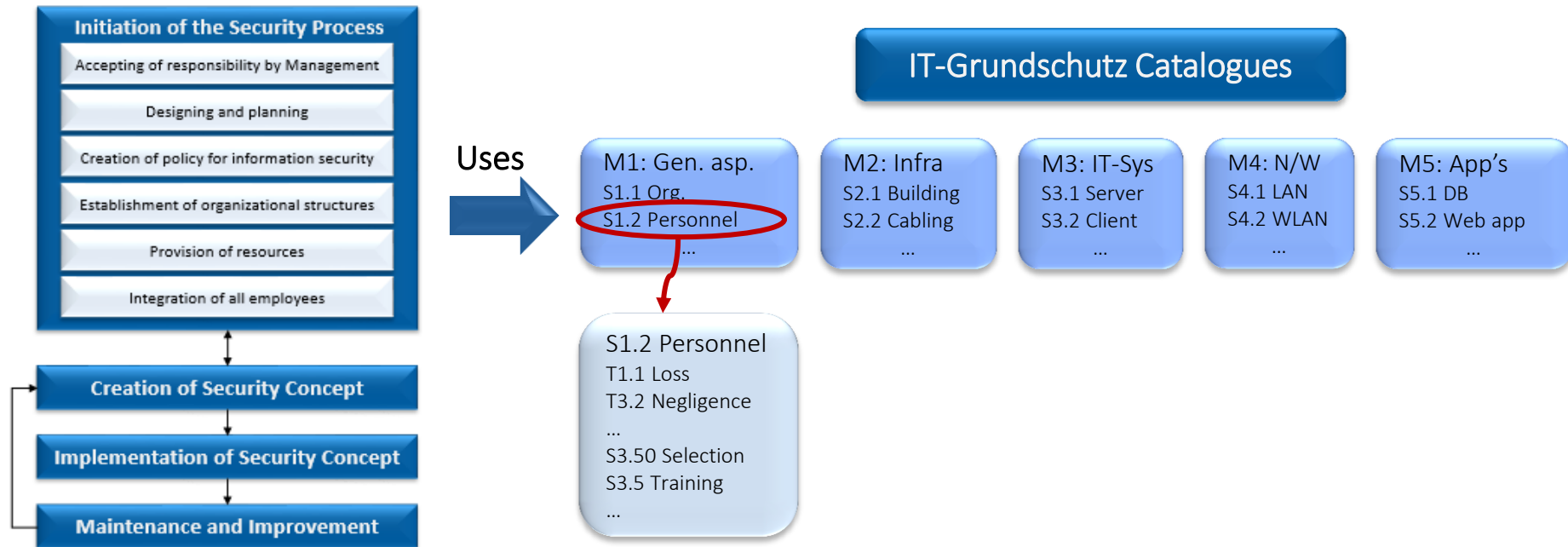


TOGAF



BSI-IT-Grundschatz

IT-Grundschutz Catalogues



Mapping between TOGAF and BSI-IT-Grundschutz Components

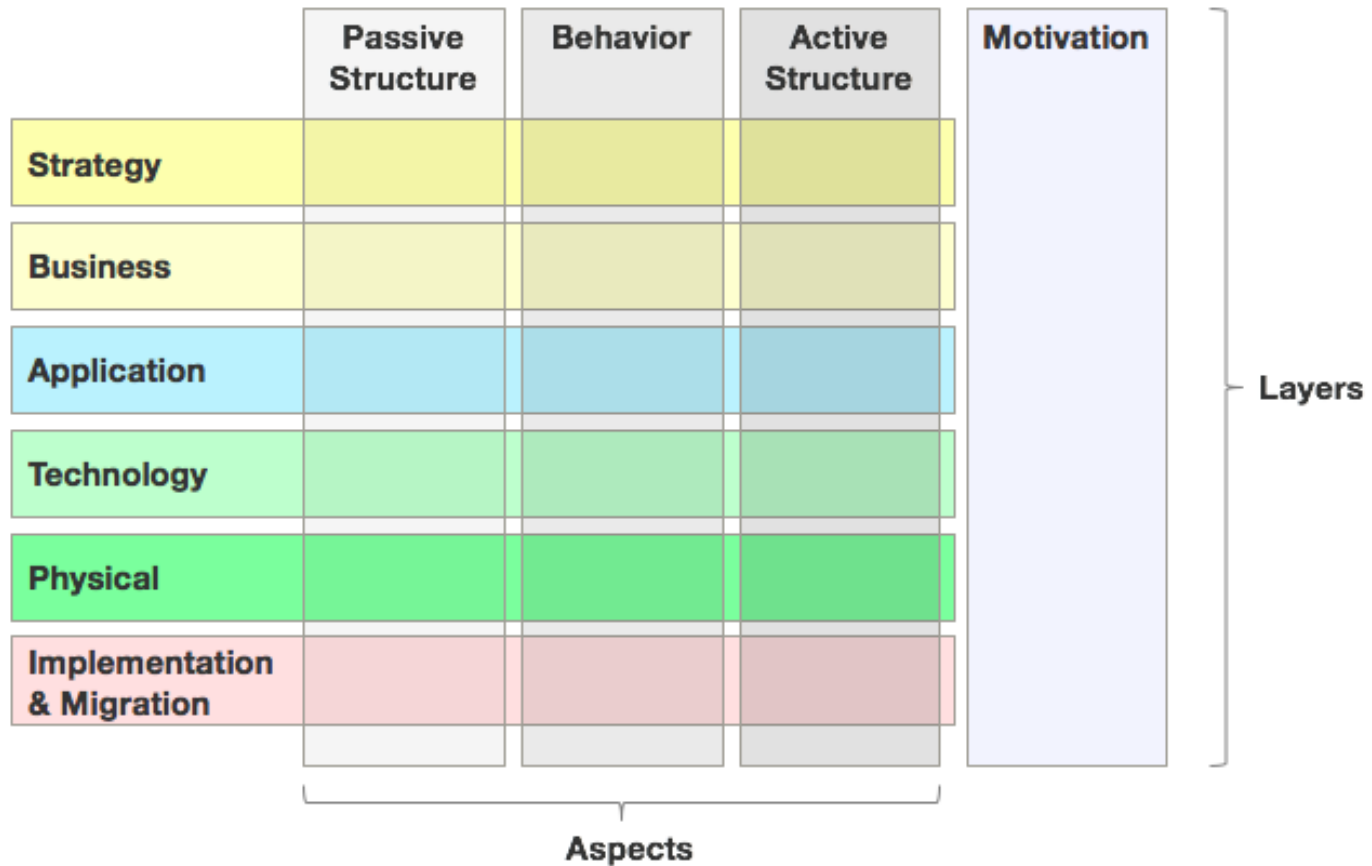


Real-World Scenario

- Mapping between a company's Enterprise Architecture and BSI-IT-Grundschutz
- Uses ArchiMate to model it's Enterprise Architecture

'ArchiMate' is an Enterprise Architecture modelling language to support the description, analysis & visualization of architecture within & across business domains

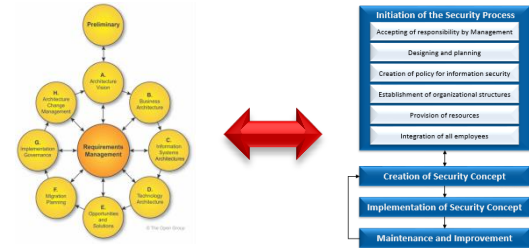
Archimate



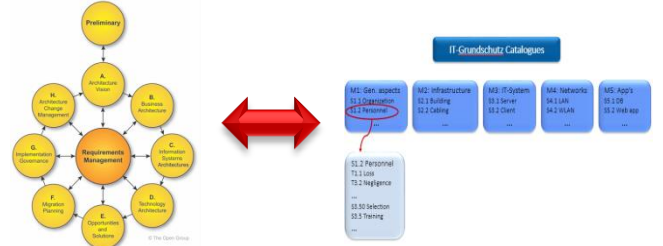
Thesis Goals



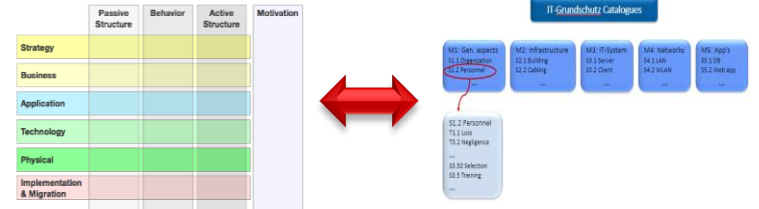
TOGAF & BSI-IT-Grundschutz Process



TOGAF & BSI-IT-Grundschutz Components



Archimate & BSI-IT-Grundschutz Components



Company's EA model & BSI-IT-Grundschutz Components



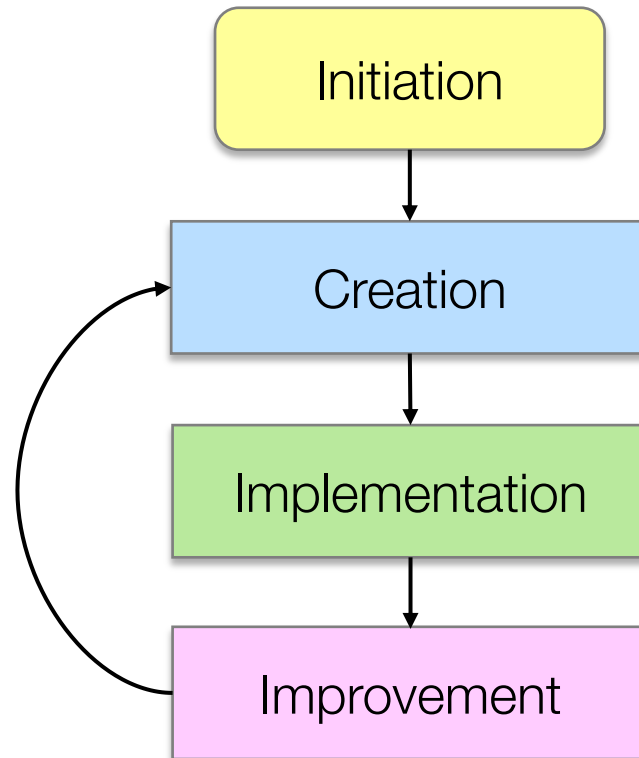
- TOGAF
 - Most commonly employed EAF
 - EA model of the company developed using TOGAF
- BSI-IT-Grundschutz
 - Same content as of other standards
 - Solely for IT-Security of organizations in Germany
 - ISO certification

Motivation

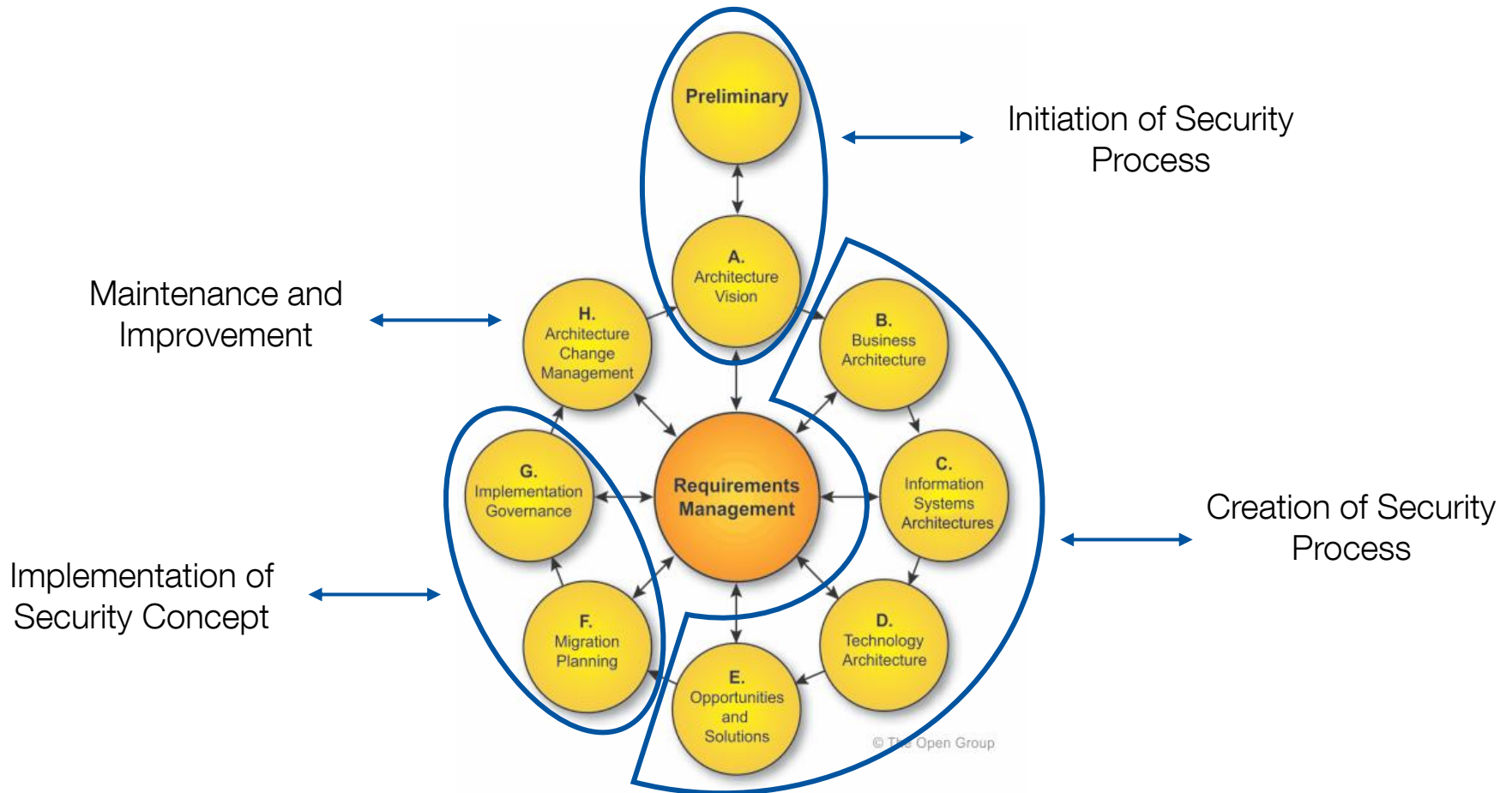
- Adaptation of security safeguards of BSI-IT-Grundschutz in TOGAF
- Re-use of identified TOGAF components in future (Ex: while developing an automated tool)



1. Mapping TOGAF and BSI-IT-Grundschutz Process



1. Mapping TOGAF and BSI-IT-Grundschutz Process

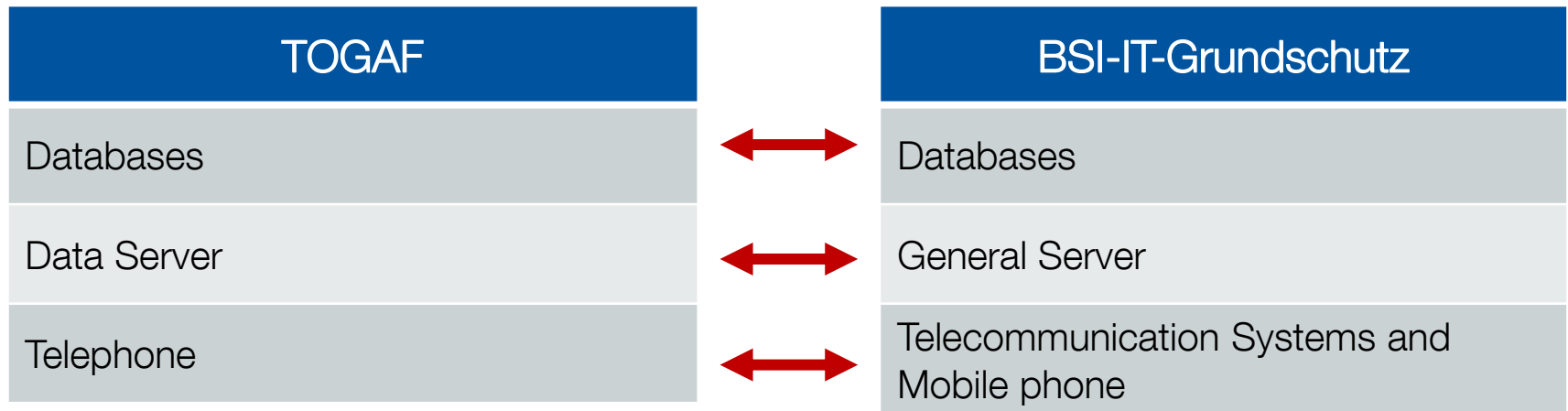


2. Mapping TOGAF and BSI-IT-Grundschutz Components

- Manual Mapping
- Specific mapping – A rare occurrence
- J. König et. al. “Mapping the Substation Configuration Language of IEC 61850 to ArchiMate”
 - Identified the SCL objects having the relation “*is a kind of*” or “*is a part of*” to any entity of ArchiMate

2. Mapping TOGAF and BSI-IT-Grundschutz Components

- 1:1 and 1:N mapping



Evaluation

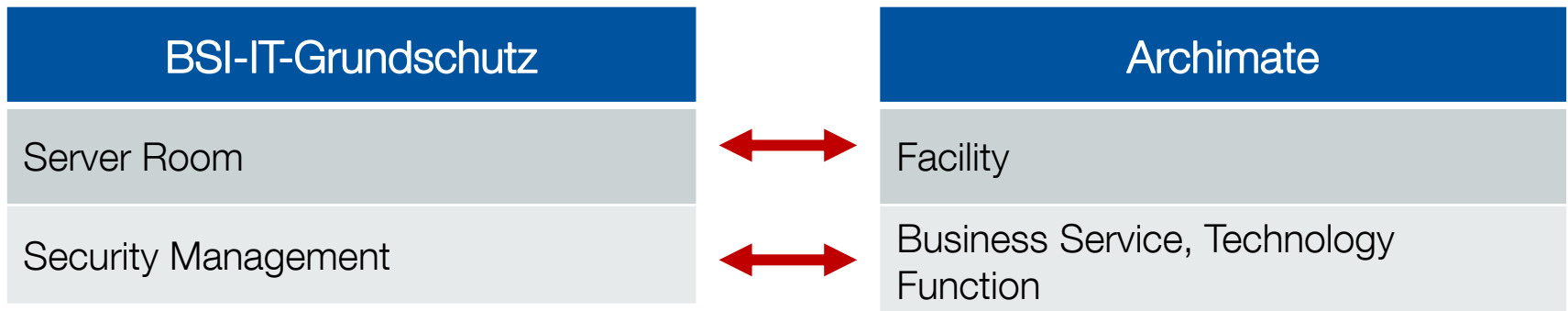
- Chose 14 mappings after Stratified Random Sampling
- Evaluators: Prof. Reudiger Grimm, Paul C. Johannes
- Each mapping evaluated on a 5 point scale
- Summary & Feedback

	Participant 1	Participant 2
SA	11	8
A	2	4
U/N	-	-
D	1	-
SD	-	2



3. Mapping Archimate and BSI-IT-Grundschutz Components

- Manual mapping
- Specific mapping – Non-Existent
- 1:1 and 1:N mapping
- Served as a metamodel for the next mapping



4. Mapping of Company's EA model with BSI-IT-Grundschatz Components

- A. Identify the EA components from ITERGO's Archi-Template & the relationships between components
- B. Map it to the BSI-IT-Grundschatz components using the tool '**Verinice**'

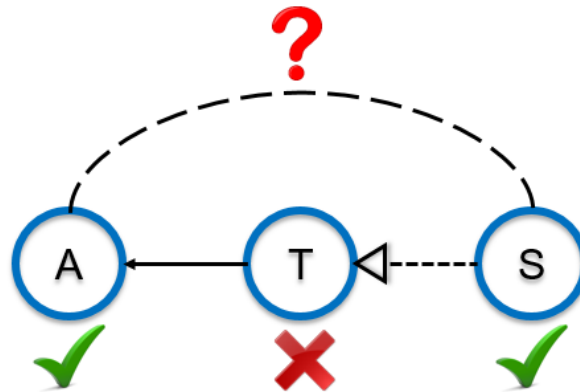
Verinice – Introduction

- Used for the creation and management of ISMS
- Consists of 9 groups
 - Applications, Buildings, IT-Systems: Clients, IT-Systems: Network Components/others, IT-Systems: PBX Components, IT Systems: Servers, Network Connections, Rooms and Staff
- Example
 - Laptop -> IT-Systems: Clients
 - Web server/File Server/Mail Server -> IT Systems: Servers
 - Business actors/departments -> Staff



Modeling Elements in Verinice

- Not all elements could be grouped in Verinice
 - technology functions, technology services, business functions, business processes, products



- Buuren et. al. - *“Composition of Relations in Enterprise Architecture Models”*

Modeling Relationships in Verinice

- Not every element can be related to every other element in Verinice
 - Example: Elements under the group IT-Systems: Clients can only have a relationship with the elements included under the groups Applications, Staff and Room

Relationship Types in Verinice

- The ArchiMate relationship types doesn't exist in Verinice
- Verinice has own set of relationship types
 - depends on, responsible for, necessary for, located in, accountable for, consulted for, informed about
- Bidirectional Relationships
 - Verinice derives relationships from existing relationships



- Non-Bidirectional Relationships



Mapping EA Model Elements and BSI-IT-Grundschutz Modules

- Mapping of BSI-IT-Grundschutz modules to EA model elements by simple drag-and-drop
- Security safeguards are automatically assigned
 - Set the implementation status of the security safeguards as per need

Verinice – Advantages and Disadvantages

Advantages

Only available tool for creation of ISMS

Easy mapping by drag-and-drop method

Easy implementation of safeguards

Allows relationship modeling

Provides protection requirements

Basic security check and risk analysis

Disadvantages

Not all elements can be modeled

Difficulty in modeling relationships

Not every element can be related to every other element

Cannot model ArchiMate relationship types

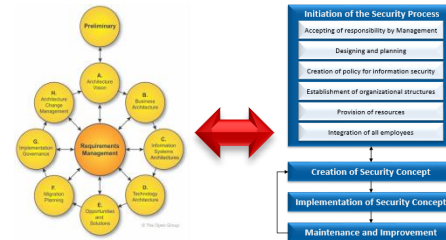


Evaluation

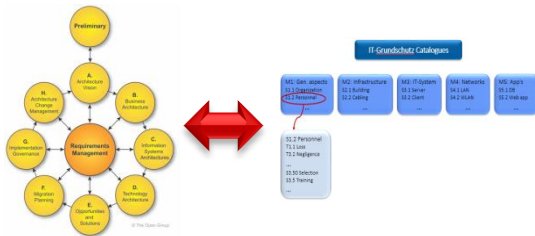
- Evaluator: Internal person from the company
- Feedback
 - Useful Mapping
 - Could be adapted and done by an internal person
 - A setback that some elements cannot be modeled
 - Categorization of modules in Verinice for easier searching



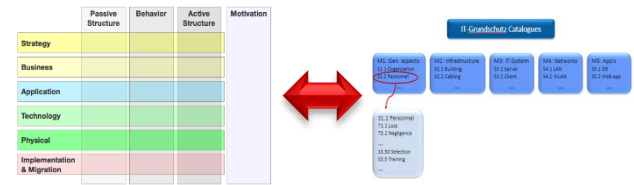
Summary



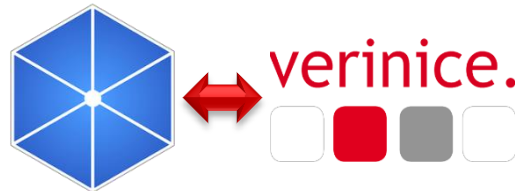
Process Mapping



TOGAF-BSI



ArchiMate-BSI



Archi-Verinice



Future Work

- Automating the mapping using identified components
 - Manual Mapping is time consuming
 - Reduces human error
- Customization of the Verinice tool
 - To model all the elements
 - To model the ArchiMate relationship types
 - Categorization of the modules

