### MISALIGNMENT SYMPTOM DETECTION with XML-based Enterprise Architecture Model Analysis



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Motivation and Problem Statement



- Motivation and Problem Statement
- Purpose of the Study and Research Questions



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- Purpose of the Study and Research Questions
- Research Methodology



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- Conclusions





The need for strategic alignment and in growing enterprise complexity



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- The role of misalignment analysis in achieving alignment



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**DEPENDENCY ANALYSIS** 

	Steer Enter	prise	Cust	ge om ers	Proc	lucts	Acquisition	Manage In vento ry	Controil Risks	Control Financing
Life	0	6		0	•			•	•	0 6
Health	0	Δ								0 1
Non-Life	0	6		•					-	0 6
Reinaurance	0	2	٩	۰	•					0 1
Building Society Funding	0	6	•	٠			•	•		0 4
Financing	0	Δ	•				•	•		0 4
Industry	0	Δ	-							4 0
Development Lines	Usag	10	Te Sa	tal No. o stens	•					
Cabol	1	18								
, 243 (C	9	2	-	4	-					
Smallak			-	4	-					
DWS C	)	14	-	1	-					
SAP D		14		2						
Office	•	2		1						
NET .		- 6		1	-1					

HETEROGENEITY ANALYSIS







- The need for strategic alignment and in growing enterprise complexity
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# **PROBLEM STATEMENT**





## **PURPOSE OF THE STUDY**

### **MAIN GOAL** To analyse strategic misalignment between the business dimension and information systems dimension

RESEARCH OBJECTIVES



## PURPOSE OF THE STUDY

MAIN GOAL	To analyse <b>strategic misalignment</b> between the business dimension and information systems dimension	
RESEARCH OBJECTIVES	<b>RO1:</b> What are the typical symptoms of misalignment according to the operation of the SAM model?	
	<b>RO2:</b> How to transform misalignment symptoms into formally analysable statements?	

**RO3:** What are the formal analysis methods of detecting misalignment symptoms in enterprise architecture models?



### **RESEARCH QUESTIONS**

RQ1	<ul> <li>Which misalignment symptoms can be detected via enterprise architecture assessment?</li> </ul>
RQ2	<ul> <li>Which dimensions and domains are needed to examine in an EA model to detect misalignment symptoms?</li> </ul>
RQ3	<ul> <li>How do EA models manifest different misalignment symptoms?</li> </ul>
RQ4	<ul> <li>With which methods can we explore the different misalignment symptoms in EA models?</li> </ul>





**Research Design** | The interactive model by Maxwell



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THE INTERACTIVE MODEL OF RESEARCH DESIGN BY MAXWELL (1996)



**Research Design** | The interactive model by Maxwell **Framework Building** | Design Science Research



### **Research Design |** The interactive model by Maxwell **Framework Building |** Design Science Research



THE PROCESS MAP OF DSR METHODOLOGY (PEFFERS ET AL., 2007)



Research Design | The interactive model by Maxwell Framework Building | Design Science Research Empirical Validation | Case Study Research

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THE PROCESS OF CASE STUDY RESEARCH (YIN, 2013)



Research Design | The interactive model by Maxwell Framework Building | Design Science Research Empirical Validation | Case Study Research





**Concept Categorization** | Review of related concepts



### **Concept Categorization** | Review of related concepts

SUBJECT AREA	APPLICATION	RQ Asgmt.
Review of Business and IT Areas	The most important organizational areas to review before proceeding alignment assessments	RQ2
Means of Symptom Analysis	Symptom description and classification approaches	RQ1, RQ4
Means of Model Overview	EA-based architecture domain and SAM domain overview	RQ2, RQ3
Means of Model Analysis	Possible alignment domain matching techniques, architecture domain matching techniques and EA analysis types	RQ4
Supportive Concept Frameworks	Supportive concept frameworks for EA alignment methods	RQ4
Potential Directions for Implementation	Potential directions for implementation	RQ3, RQ4



Concept Categorization | Review of related concepts Conceptual Design | The 3-layer research model



### **Concept Categorization** | Review of related concepts

### **Conceptual Design** | The 3-layer research model

### **MISALIGNMENT LAYER**

>> RQ1, RQ2

• Construction and formal description of misalignment symptoms DOMAIN MATCHING | SYMPTOM CLASSIFICATION | PATTERN GENERATION

#### EA MODEL LAYER

#### >> RQ3

• Preparing the underlying EA models for the misalignment symptom detection MODEL TRANSFORMATION | ARTIFACT DEFINITION | MODEL EXPORT

#### ANALYSIS LAYER

 $\rightarrow$  RQ4

Implementation details of the proposed research RULE CONSTRUCTION | RULE TESTING | OUTPUT GENERATION



Concept Categorization | Review of related concepts Conceptual Design | The 3-layer research model Proposed Research Methodology | Operation of the framework



**Concept Categorization** | Review of related concepts

Conceptual Design | The 3-layer research model

**Proposed Research Methodology** | Operation of the framework



THE CONSTRUCTION OF EA-BASED MISALIGNMENT DETECTION FRAMEWORK



**Concept Categorization** | Review of related concepts

Conceptual Design | The 3-layer research model

### **Proposed Research Methodology** | Operation of the framework

A FRAMEWORK FOR IDENTIFYING SYMPTOMS FOR EA SCOPE ANALYSIS



- Alignment perspective
- Alignment type
- Symptom definition
- Literature reference
- Sign, presence
- Occurance, presence in EA model
- Containing EA model
- Occurance on model entity level
- Other necessary sources for investigation

A FRAMEWORK FOR DETECTING MISALIGNMENT SYMPTOMS IN

#### EA SCOPE



Motivation and Problem Statement

Purpose of the Study and RQs

Construction of the Research



Concept Categorization | Review of related concepts Conceptual Design | The 3-layer research model Proposed Research Methodology | Operation of the framework Formal Implementation | Rule-based XML validation on semistructured data – Schematron-based assertion queries

# **DELIMITATIONS OF THE STUDY**

### **Conceptual limitations**

- Not for alignment maturity assessment
- Not for soft alignment characteristics (e.g. organizational culture)
- Not all misalignment phenomena can be detected via EA assessment (e.g. culture or shared values)
- Undocumented symptoms cannot be identified with the framework
- Not misalignment correction and prevention, only detection
- Not other classification schemes, except the symptom-based approach

### Methodological limitations

• Not cross-sectional case studies



### RESEARCH CHALLENGES OF EA-BASED MISALIGNMENT ASSESSMENT

### Query types

- Symptoms in which the presence or lack of the certain types of attributes has to be investigated.
- Symptoms in which the cardinality of certain connection types has to be analysed.
- Symptoms in which more models have to be compared.
- Symptoms in which more model variants have to be analysed and compared during the progression of the project.

### Symptom validation

- The proposed research does not provide the potential for matching the EA models under review with an ideal model.
- The preliminary validation of misalignment symptoms cannot be done due to the specific follow-up interpretations of misalignment phenomena at test organisations.





### Extensions of the framework

- Additional alignment perspectives
- Analysis of S.C.03 symptoms
- Expansion of misalignment symptom catalogues and EA analysis collections



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The dynamic nature of symptom detection



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The dynamic nature of symptom detection

Generation of Description Logic statements to open the door to ontologybased analysis



# CONCLUSIONS

### CONTRIBUTION

A formal approach for EAbased misalignment assessment

Formal rule testing and XML validation in complex EA models

Recommending artifacts and EA analysis types to misalignment symptoms

### **S**IGNIFICANCE

The compound of methods for EA-based misalignment assessment

(Mis)alignment assessment in a complex EA model structure

The combination of theoretical foundation and algorithmic implementation



### THANK YOU FOR YOUR ATTENTION!

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