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ALIGNMENT OF REMMO WITH RBAC TO MANAGE ACCESS RIGHTS IN THE FRAME OF ENTERPRISE ARCHITECTURE

CHRISTOPHE FELTUS, ERIC DUBOIS, MICHAËL PETIT

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INSTITUTE
OF SCIENCE
AND TECHNOLOGY



OVERVIEW

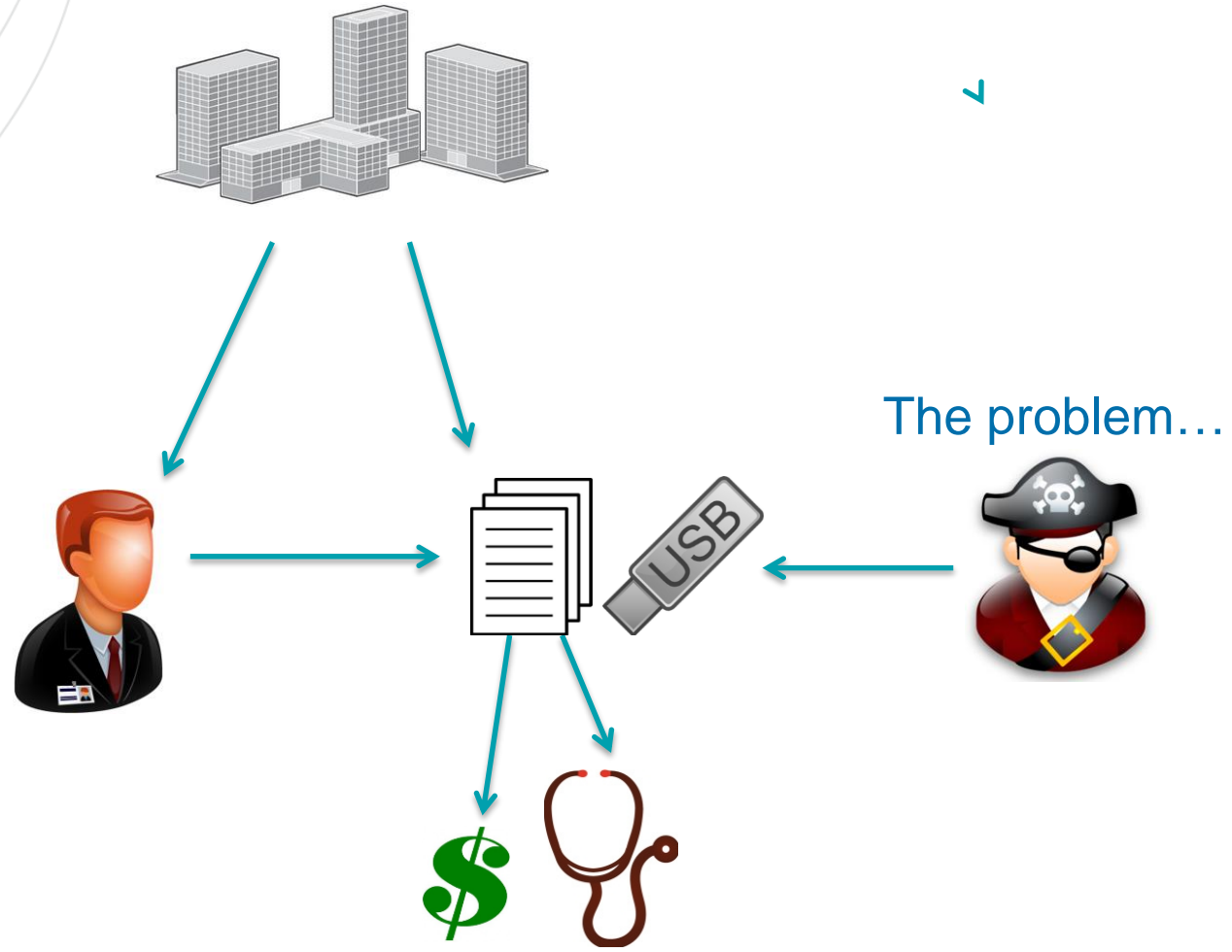
- Introduction
- Responsibility metamodel
- ArchiMate extension with Responsibility
- Method for the access rights management
- Conclusions

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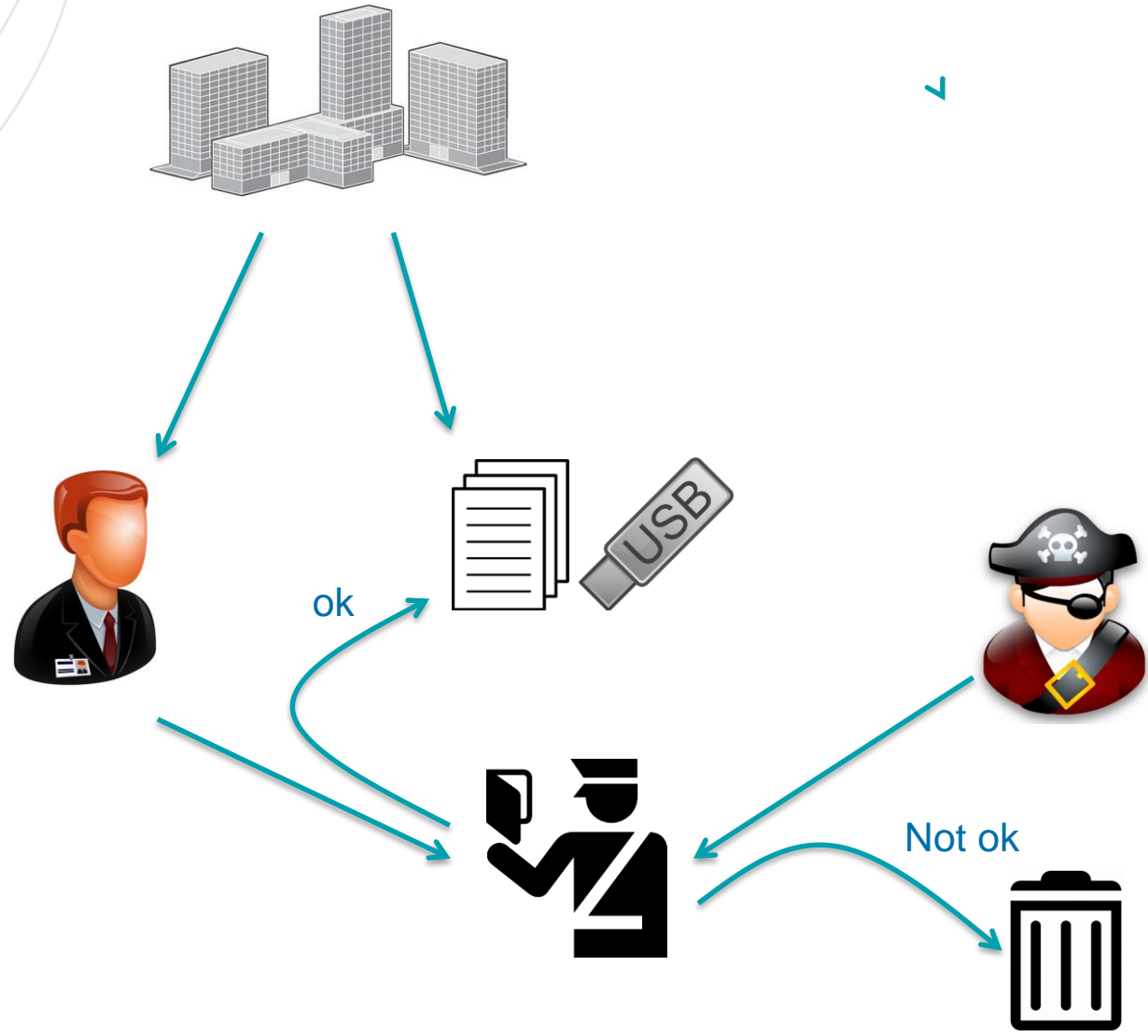
INTRODUCTION

Context



INTRODUCTION

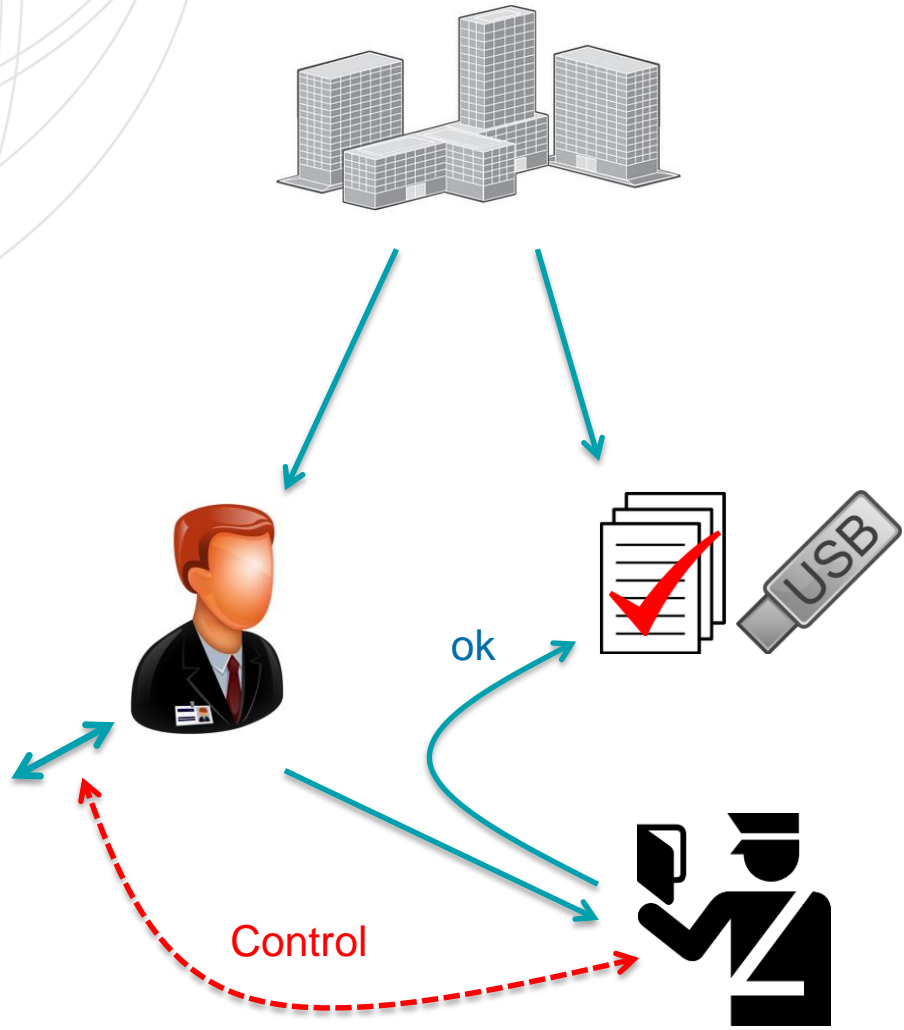
Context



INTRODUCTION

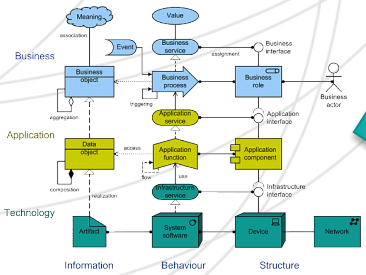
Context

Roles

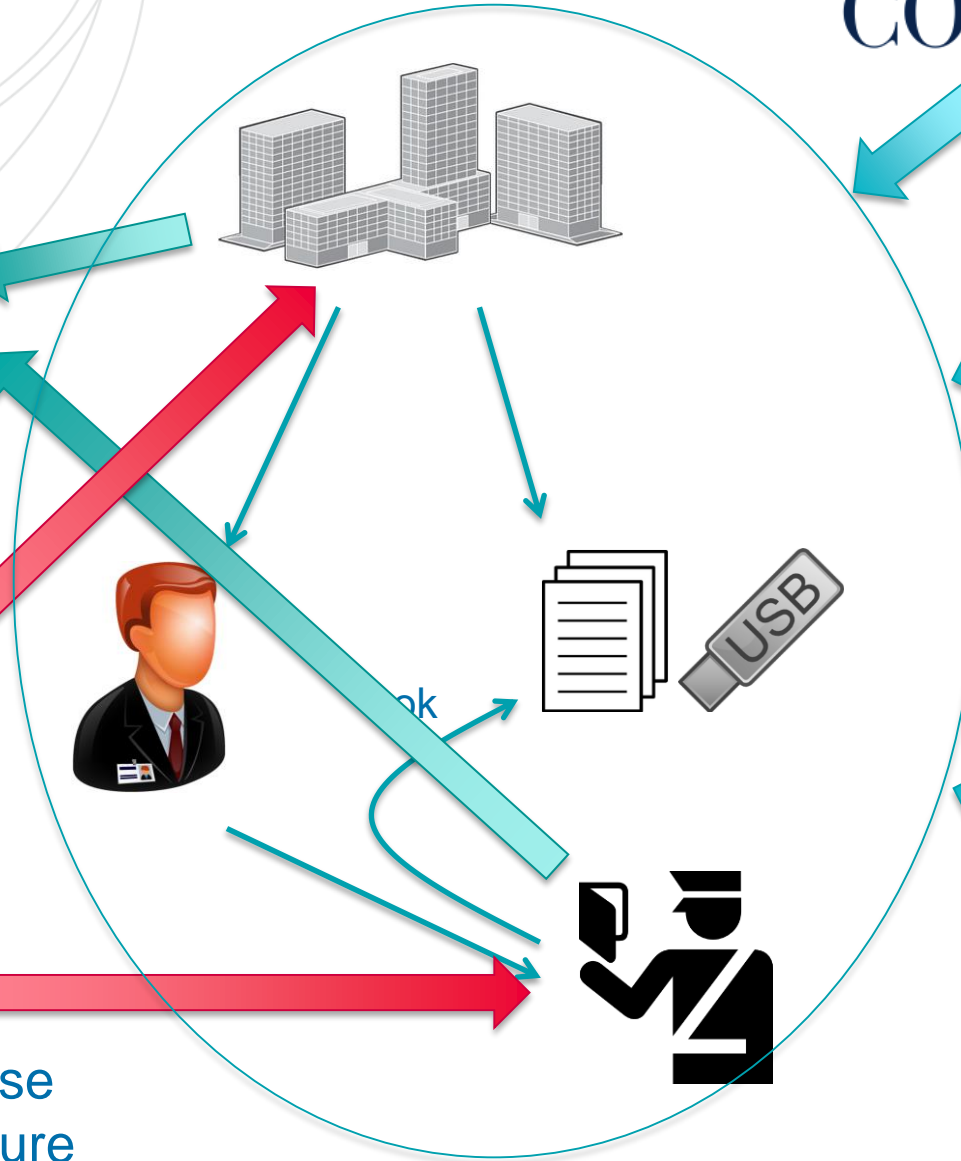


INTRODUCTION

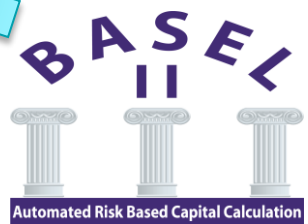
Context



Enterprise
Architecture

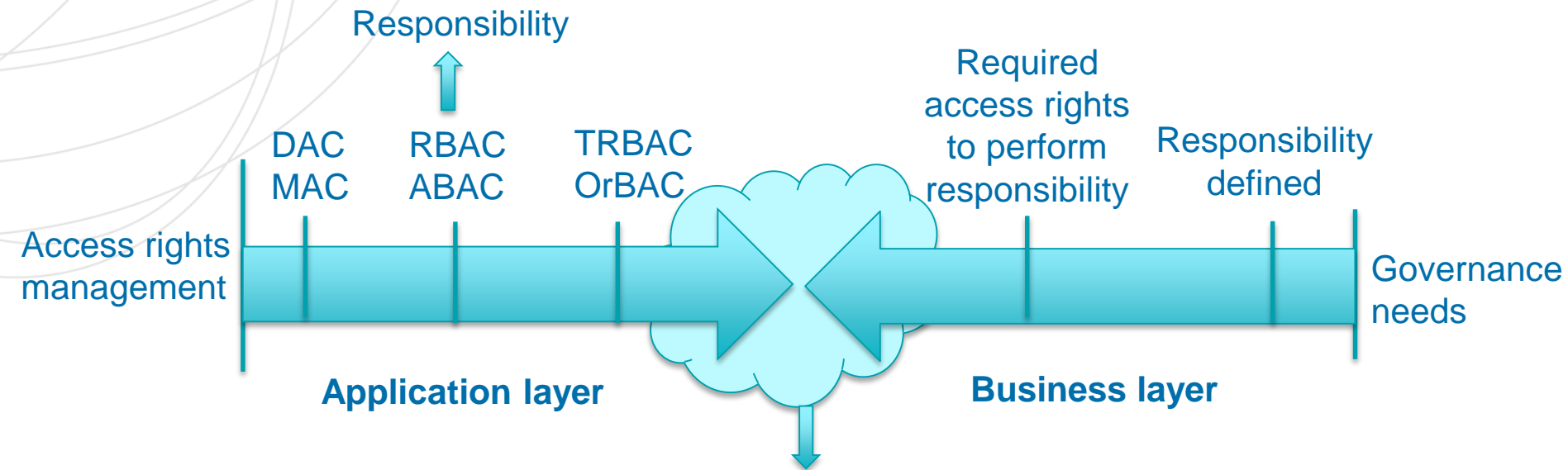


COBIT[®] 



INTRODUCTION

Responsibility as an hyphen

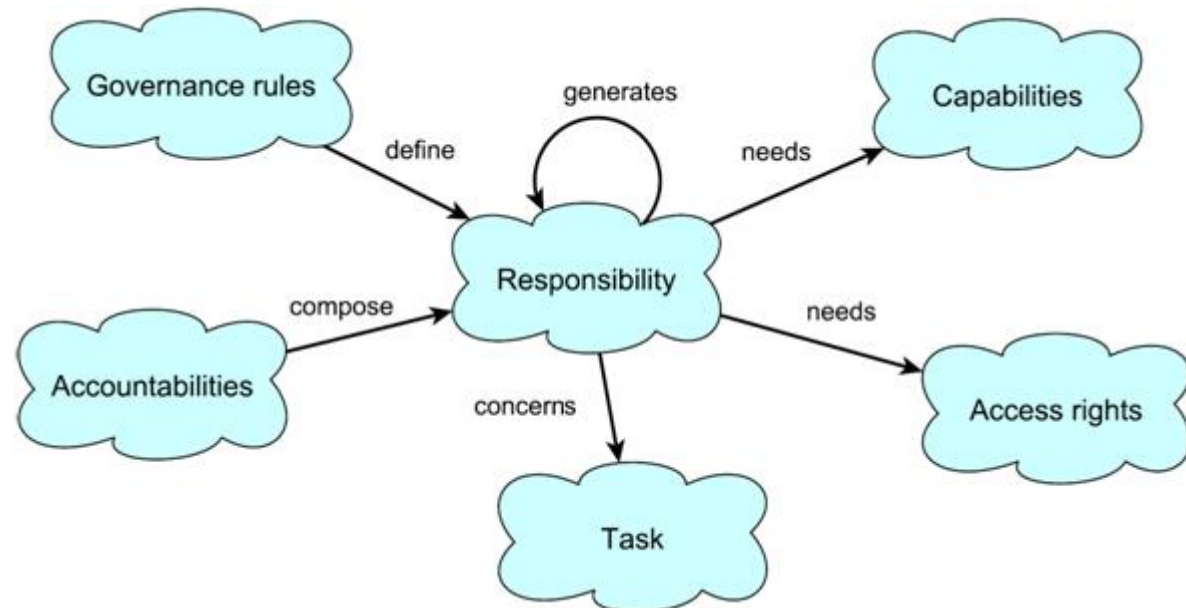
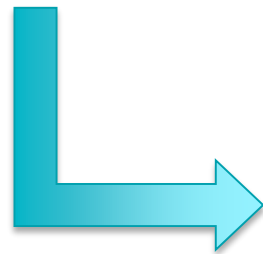


- Access rights management tends to consider business concepts
- Governance needs require to provide accurate access rights
- Responsibility is perceived as an hyphen between both worlds

INTRODUCTION

Unrefined picture of zone of concepts

	COBIT	ISO/IEC 27000	ISO/IEC 38500	BASEL II	SOX
Responsibility needs capabilities	X		X	X	X
Responsibility generates responsibility	X	X	X	X	
Responsibility composed of accountabilities	X	X	X	X	X
Responsibility concerns tasks	X	X	X	X	X
Responsibility defined by Governance rules	X		X	X	X
Responsibility needs access rights	X	X			X



INTRODUCTION

Designed artefacts

- Considering the corporate and IT governance needs, what are the concepts which constitute the core of the employee responsibility and how these concepts may be associated in a dedicated Responsibility metamodel?
- **Responsibility metamodel**
- How may business/IT alignment be improved considering the responsibility, in the context of enterprise architecture models, and for the field of access rights management?
- **ArchiMate extension with the Responsibility metamodel**
- How may responsibility be mapped with the role based access control model and how does this mapping enhances the engineering of roles?
- **Method for the access rights management**

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RESPONSIBILITY METAMODEL

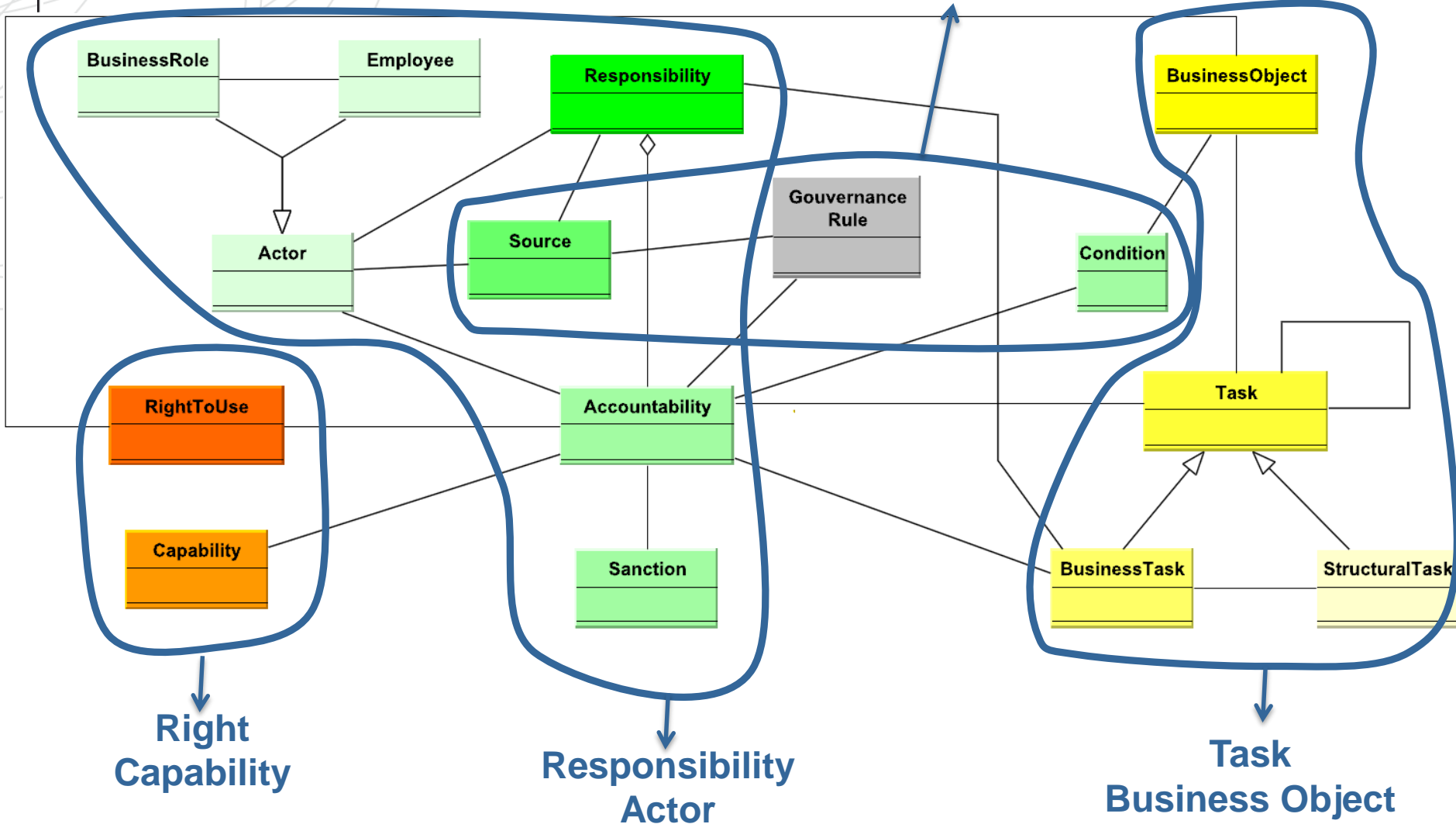
Method and Limitations

- Method
 - Review of the concepts from the literature
 - Concepts definition
 - Integration in the Responsibility metamodel
- Limitations
 - Responsibility relates to business tasks
 - Responsibility are those of employees from bureaucratic organisations
 - Responsibility metamodel kept simple

RESPONSIBILITY METAMODEL

Uncluttered view

Condition, Source
Governance rule



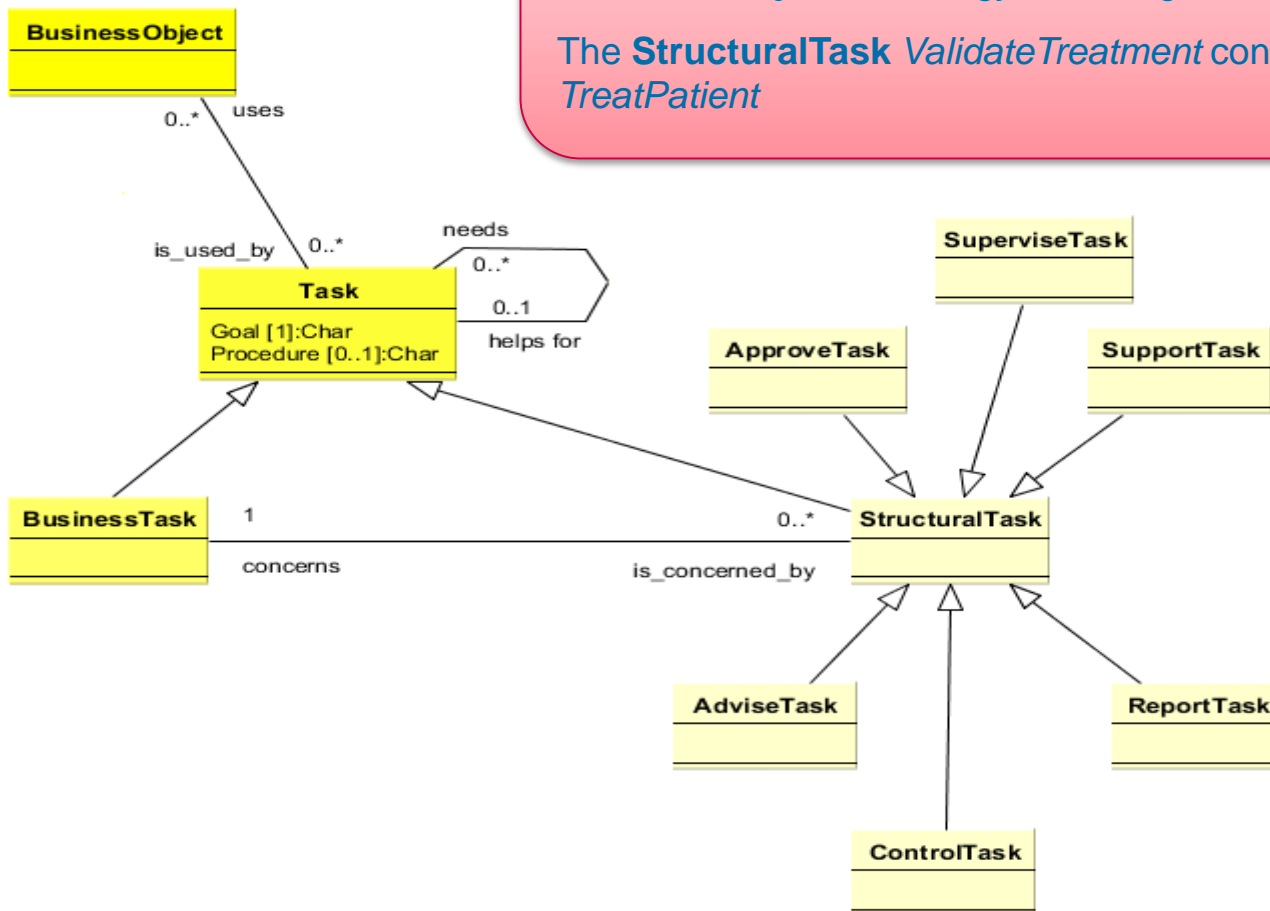
RESPONSIBILITY METAMODEL

Task and Business object

The **BusinessTask** *TreatPatient* uses the **BusinessObject** *PatientFile*

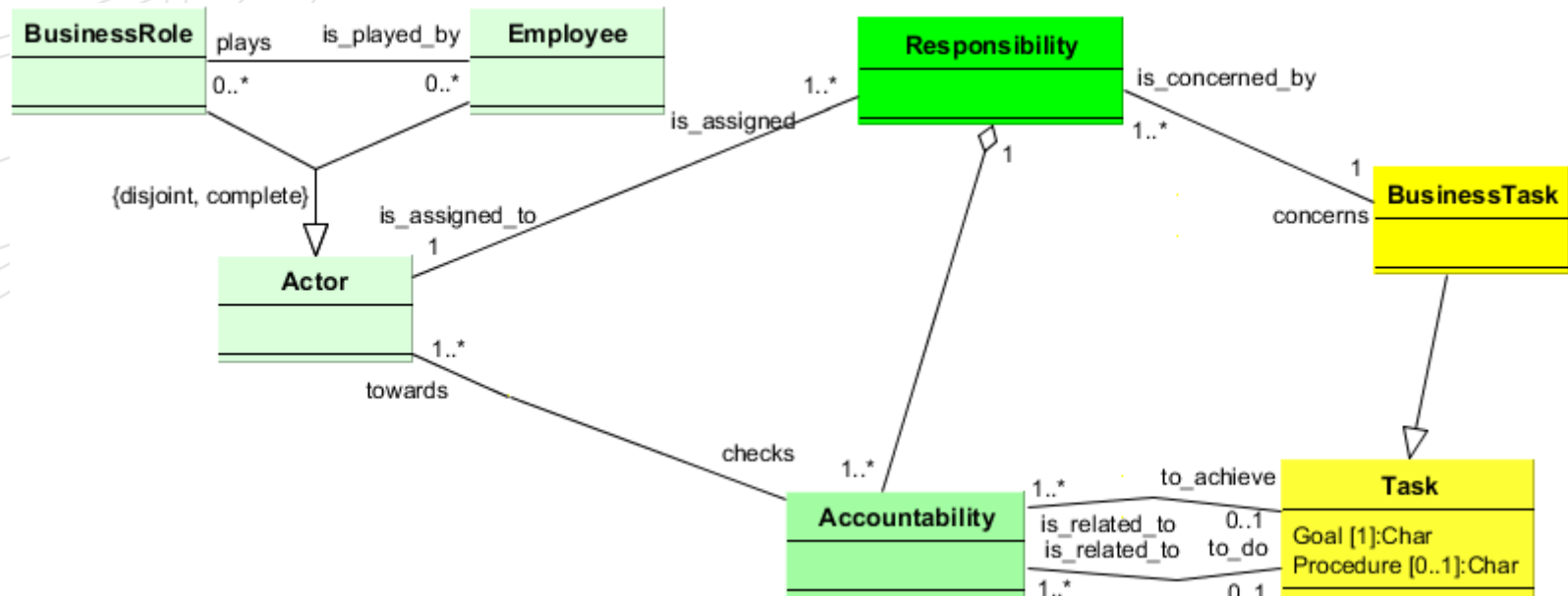
The **BusinessTask** *SeekInformationAboutPathology* uses the **BusinessObject** *PathologyKnowledgeBase*

The **StructuralTask** *ValidateTreatment* concerns the **BusinessTask** *TreatPatient*



RESPONSIBILITY METAMODEL

Actor, Responsibility, Accountability



Alice plays the **BusinessRole** of *IT specialist* and is assigned to the **Responsibility** which aggregates the **Accountability to_do** *UpdatePathologyKnowledgeBase*

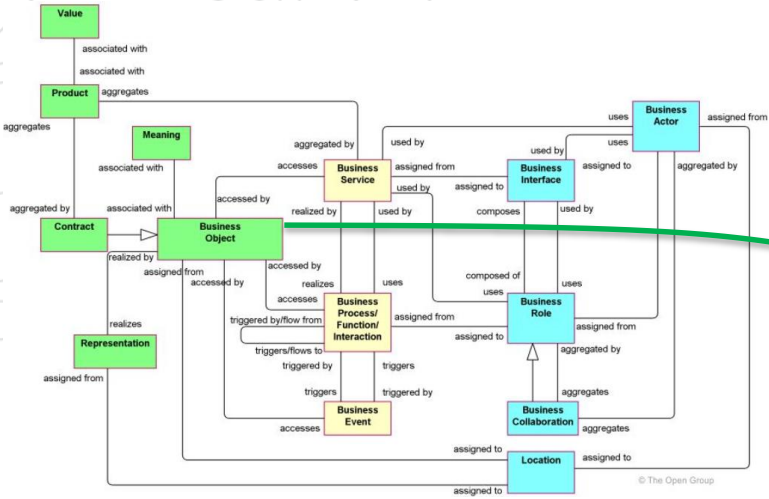
The *DoctorGeneral* is assigned to the **Responsibility** which aggregates the **Accountability to_achieve** *TreatPatient*

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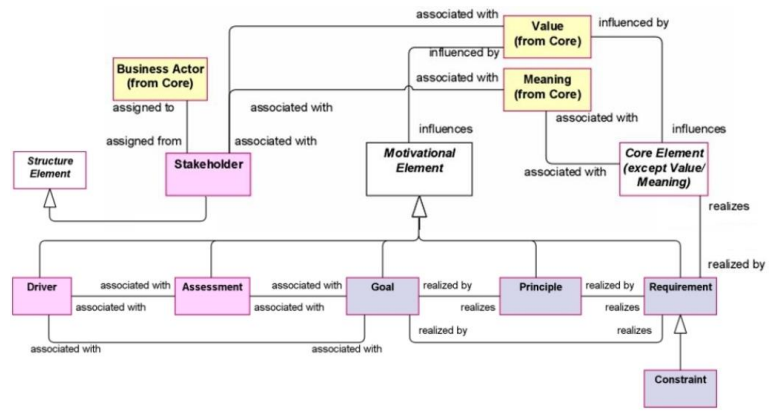
ARCHIMATE EXTENSION

Type of mappings

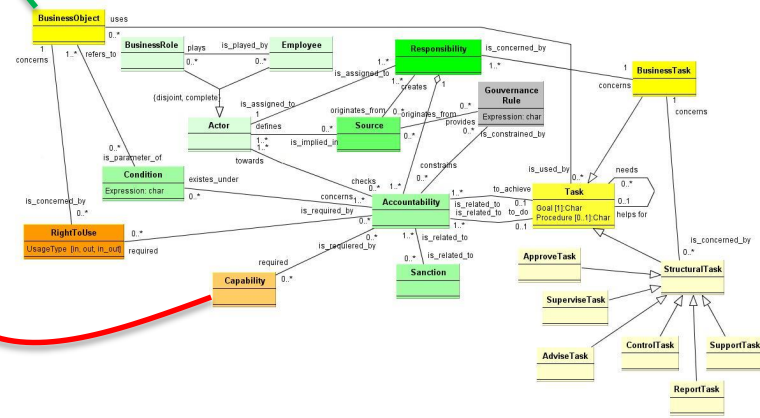


n-m mapping

1-1 mapping

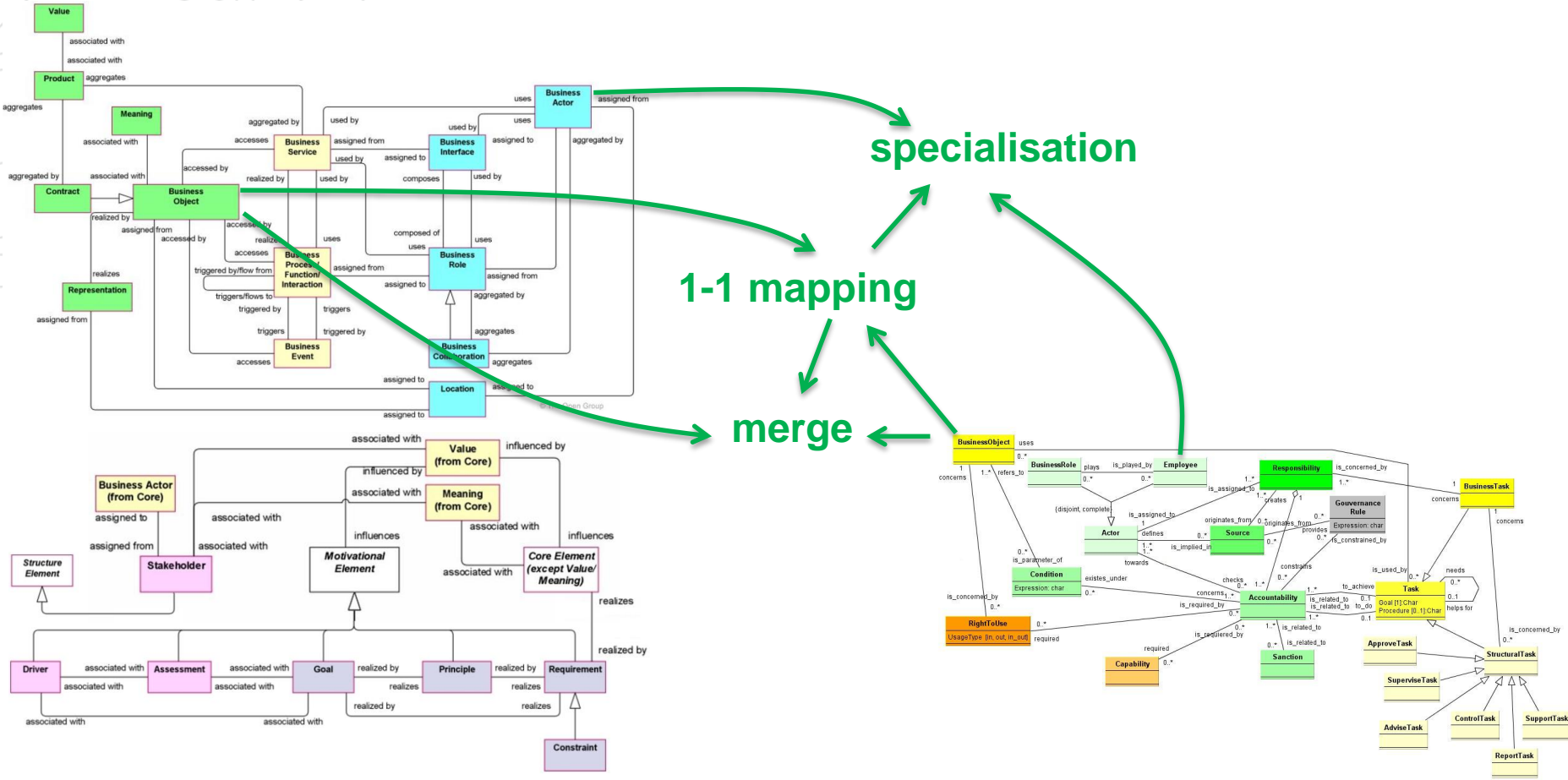


No mapping



ARCHIMATE EXTENSION

Metamodel Integration



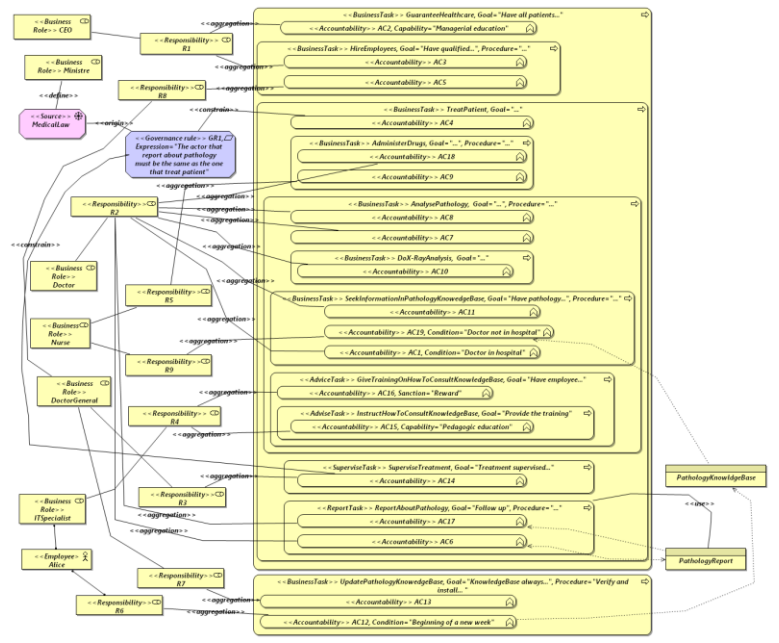
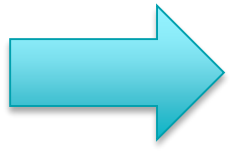
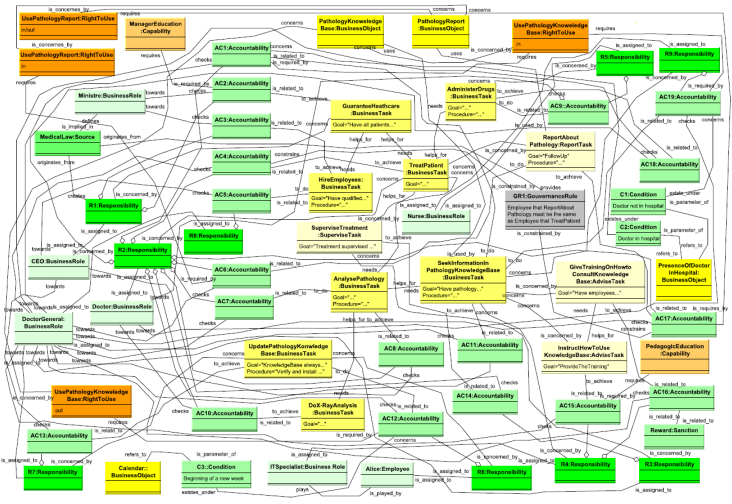
ARCHIMATE EXTENSION

Result

Responsibility element	ArchiMate element	Mapping	Integration rule	Integrated element
Business Object	Business Object	1:1	Merge	Business Object
Task	Business Process	1:1	Specialisation	<<Task>>
R_Business Role	Business Role	1:1	Specialisation	<<R_BusinessRole>>
Responsibility	Business Role	1:1	Specialisation	<<Responsibility>>
Employee	Business Actor	1:1	Specialisation	<<Employee>>
Accountability	Business Function	1:1	Specialisation	<<Accountability>>
Right To Use	Access association	1:1	Specialisation	<<RightToUse>>
Sanction	-	-	Addition of attribute	<<Accountability>>, Sanction: Sanction description
Condition	-	-	Addition of attribute	<<Accountability>>, Condition: Condition description
Capability	-	-	Addition of attribute	<<Accountability>>, Capability: Capability description
Source	Driver	1:1	Specialisation	<<Source>
Governance Rule	Requirement	1:1	Specialisation	<<Governance Rule>>

ARCHIMATE EXTENSION

Illustration



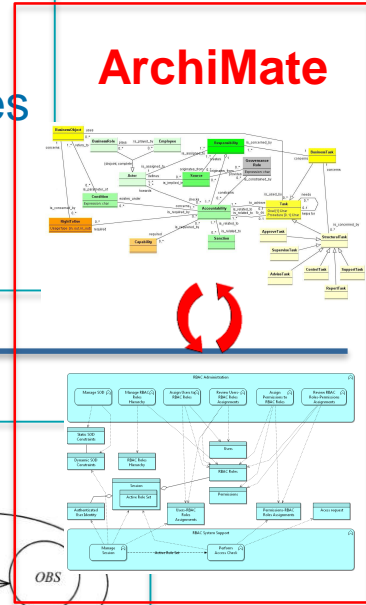
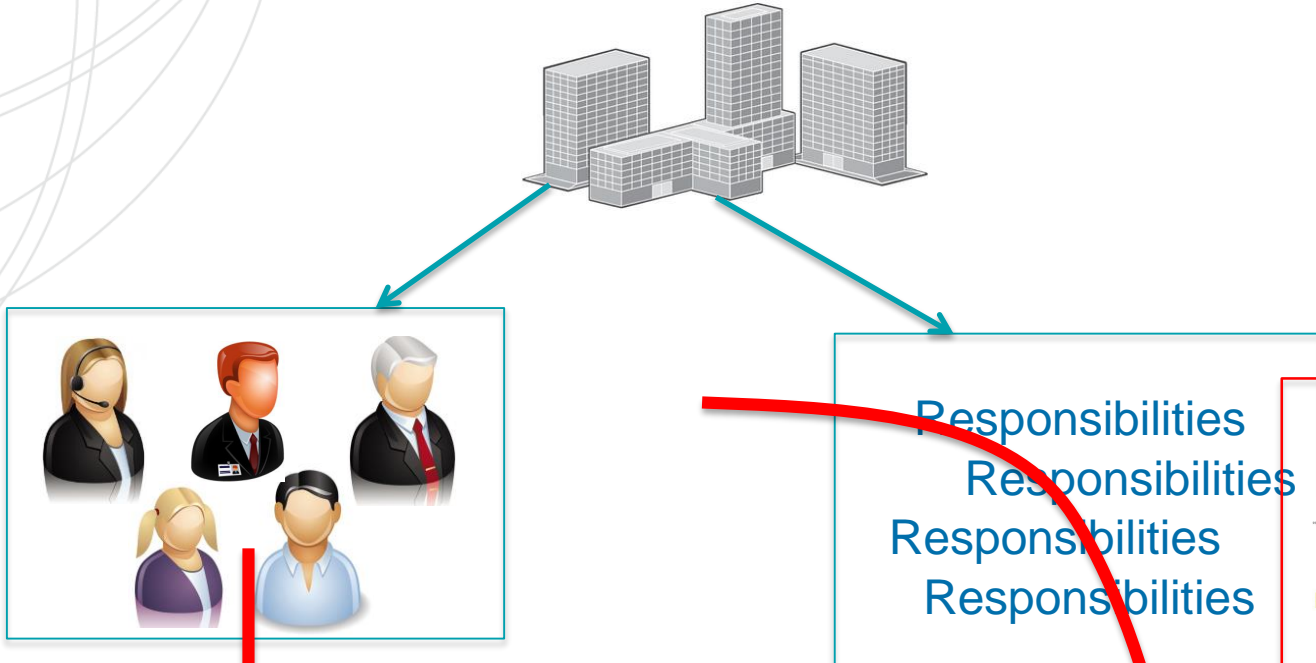
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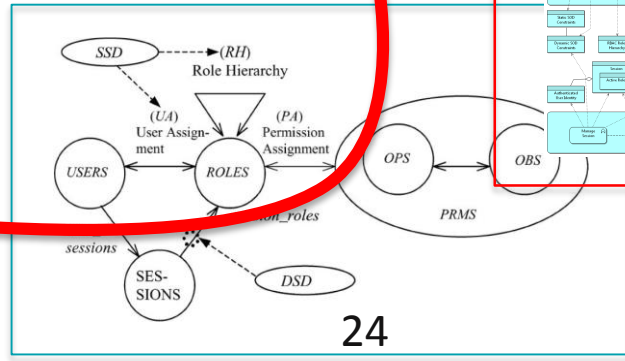
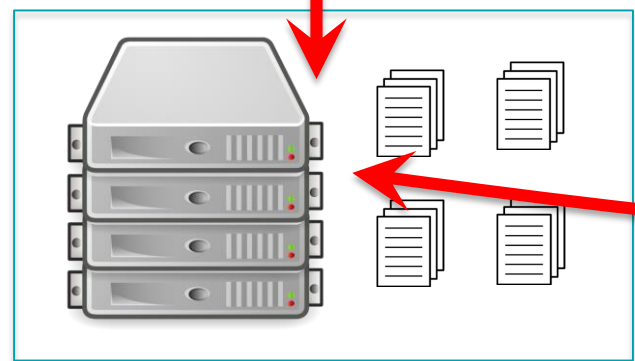
AR MANAGEMENT METHOD

Principle

Business
Layer

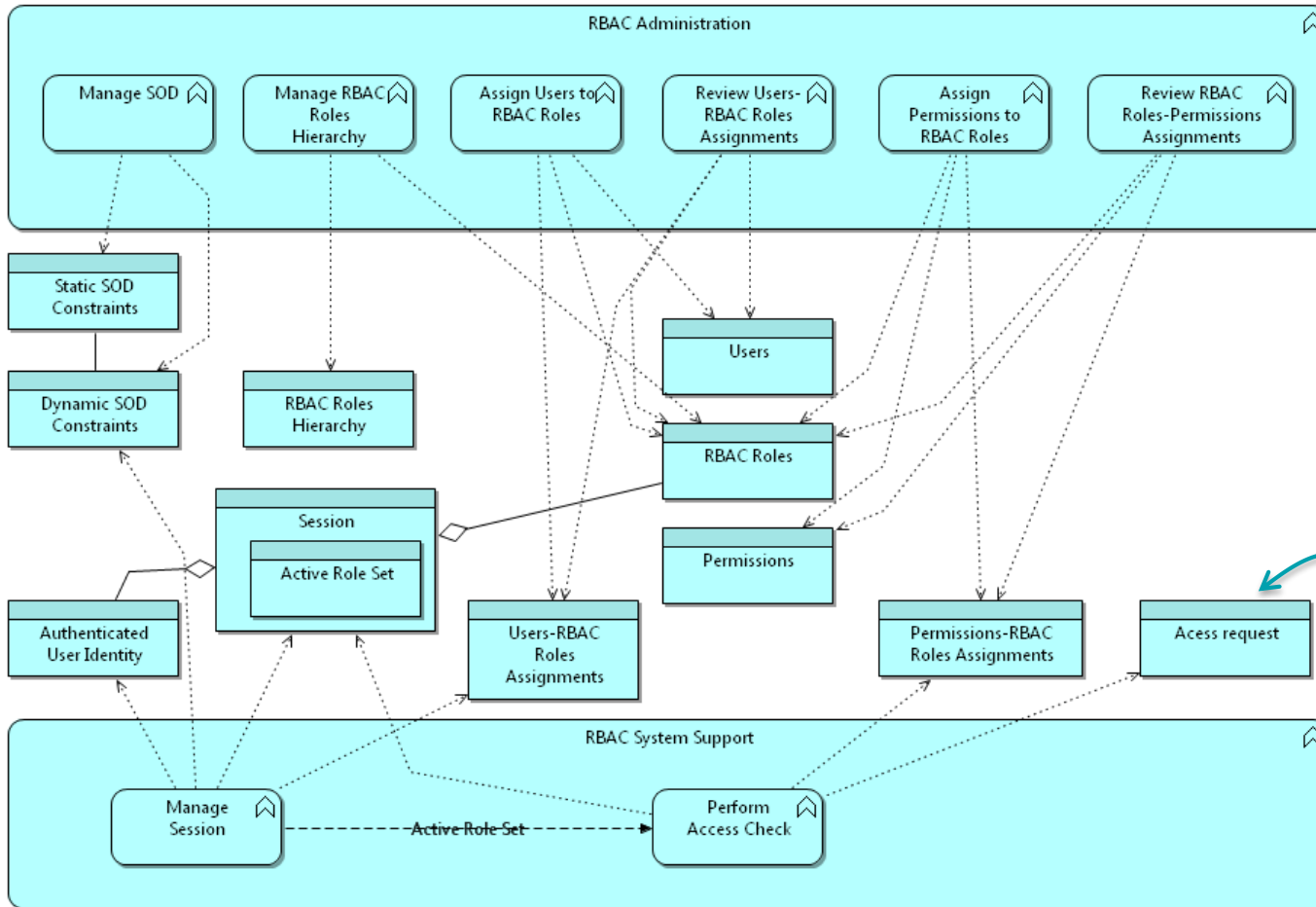


Application
Layer



AR MANAGEMENT METHOD

Existing *RBAC reference model* in ArchiMate, *Band* (2011)



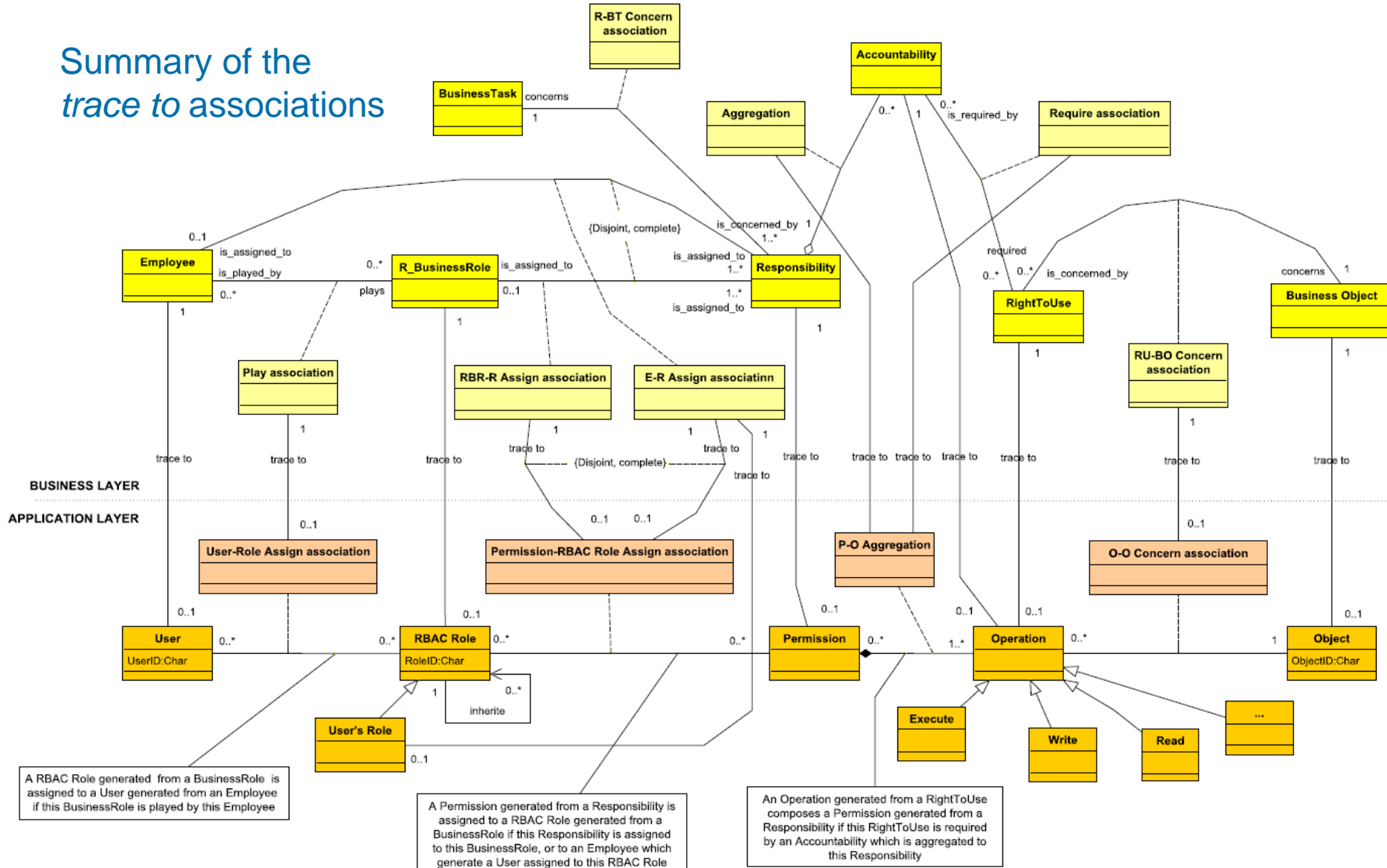
Application function: represents a behaviour element that groups automated behaviour which can be performed by an application component

Data object: represents a passive element suitable for automated processing

AR MANAGEMENT METHOD

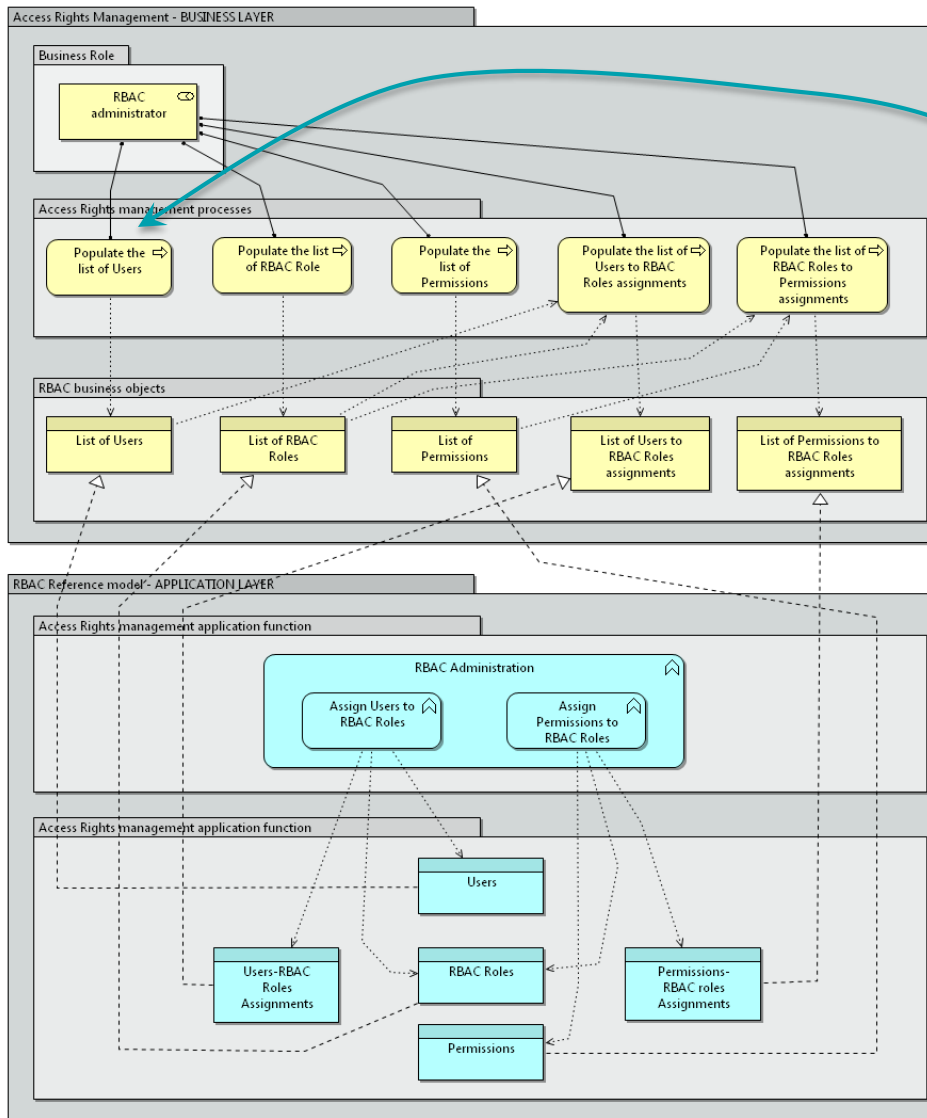
Responsibility-RBAC alignment

Summary of the
trace to associations



AR MANAGEMENT METHOD

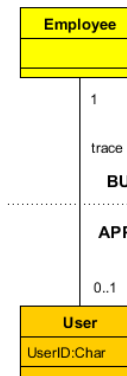
AR Management Reference Model



Business role: RBAC administrator

Business processes:

- *Populate the list of Users*



- Collects the list of employees who need to access the information system
- *From the responsibilities model in ArchiMate*
- Output: Business object «List of Users»
- List of users realized by data object «Users»

- *Populate the list of RBAC Roles*

- *Populate the list of Permissions*

- *Populate the list of Users to RBAC Roles assignments*

- *Populate the list of RBAC Roles to Permissions assignments*

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CONCLUSIONS

- State of the art: Access Control Models and Governance needs
 - Access rights models/methods tend to consider business concepts (responsibility)
 - Governance requires the definition of responsibilities and associated access rights
 - 3 main designed artefacts:
 1. Responsibility metamodel
 2. Responsibility extension of ArchiMate Business layer
 3. Method for access rights management based on the Responsibility alignment with RBAC
- Limitations
 - Evaluation mainly performed with case studies
 - Alignment only with RBAC model

THANK YOU ! QUESTIONS ?



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