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

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OVERVIEW

LUXEMBOURG INSTITUTE OF SCIENCE AND TECHNOLOGY

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

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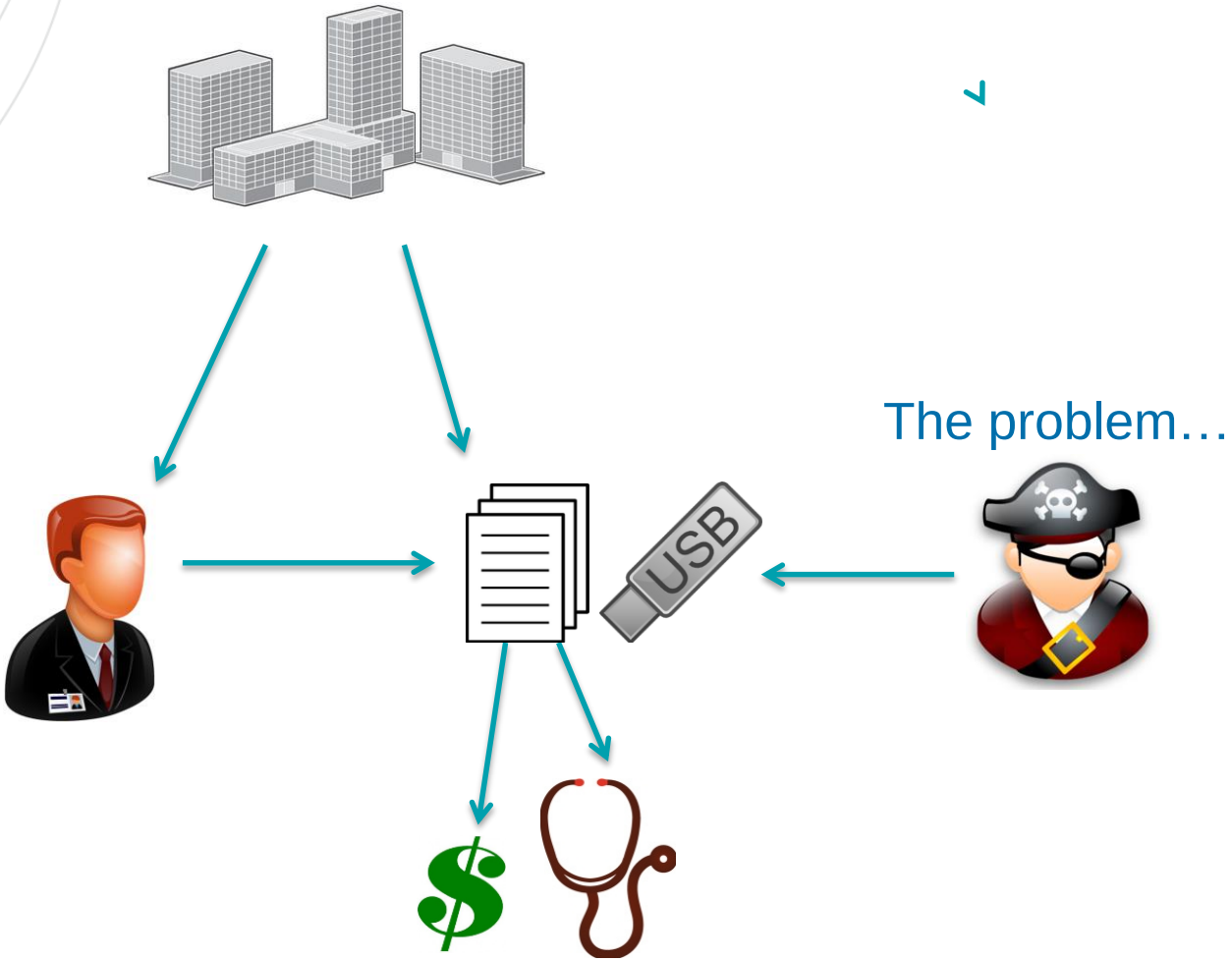
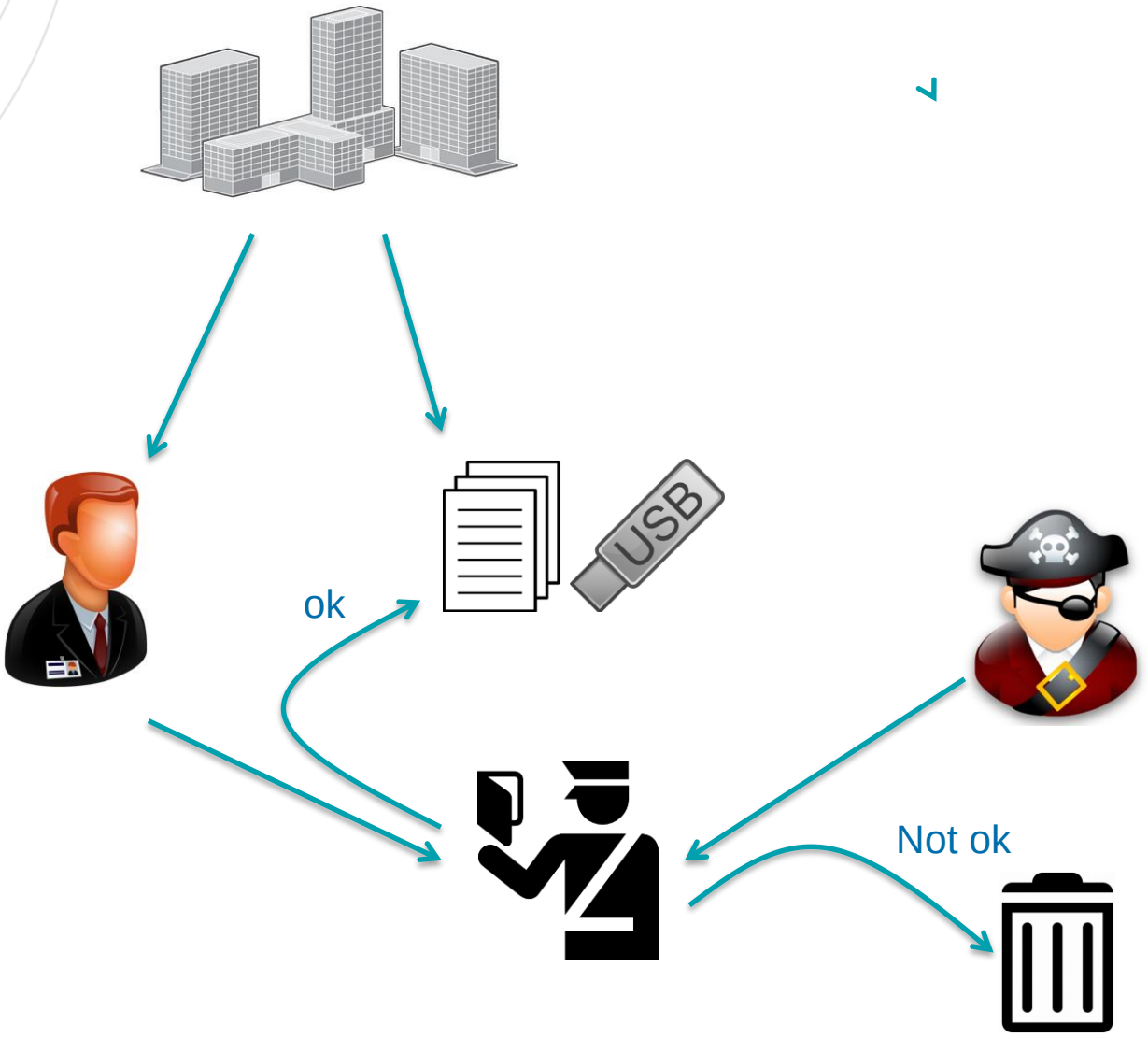
INTRODUCTION

Context



INTRODUCTION

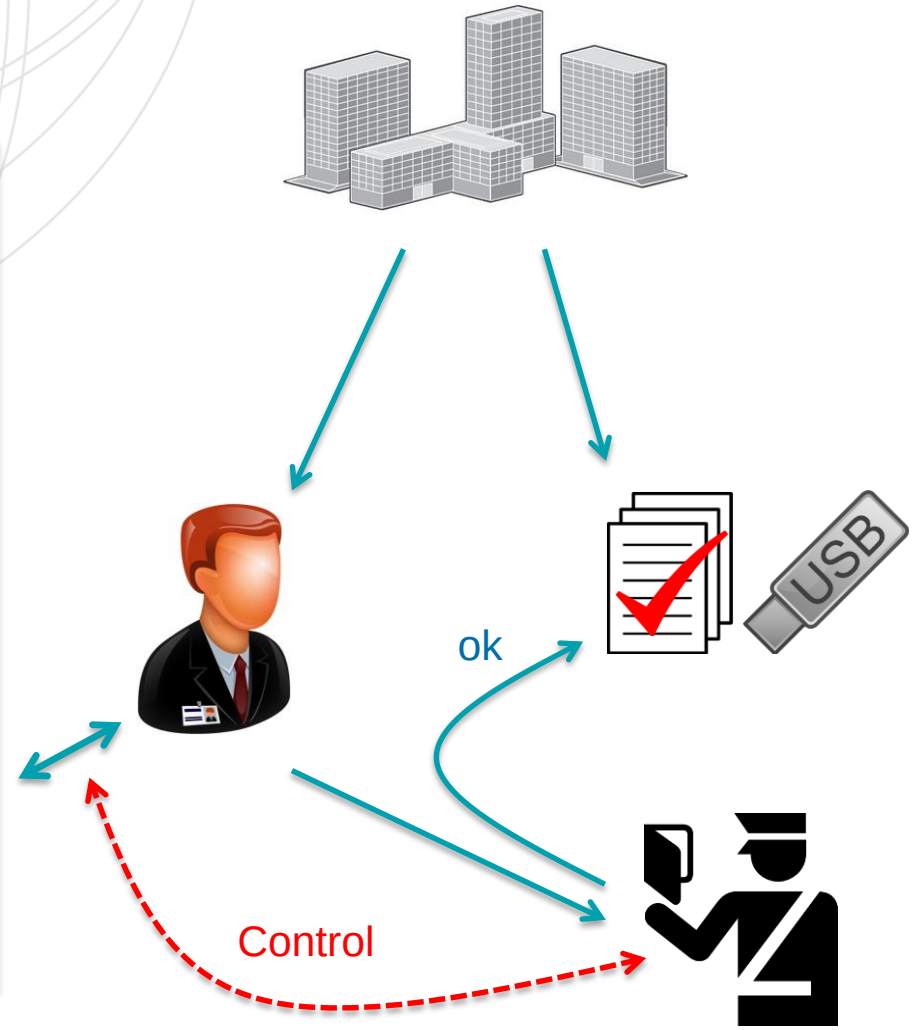
Context



INTRODUCTION

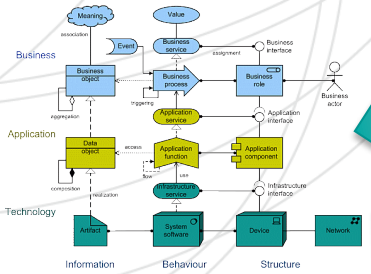
Context

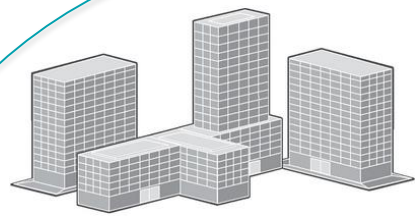
Roles

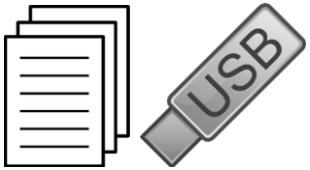


INTRODUCTION

Context







Enterprise Architecture

COBIT 5

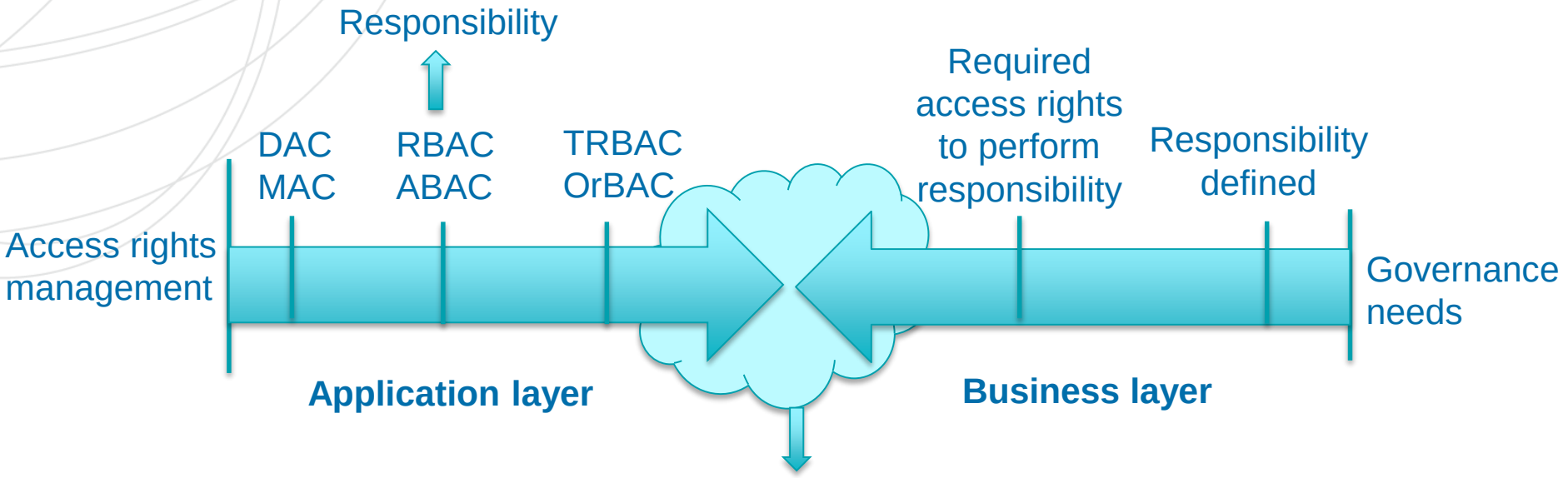
SOX

ISO International Organization for Standardization

BASEL II Automated Risk Based Capital Calculation

INTRODUCTION

Responsibility as an hyphen

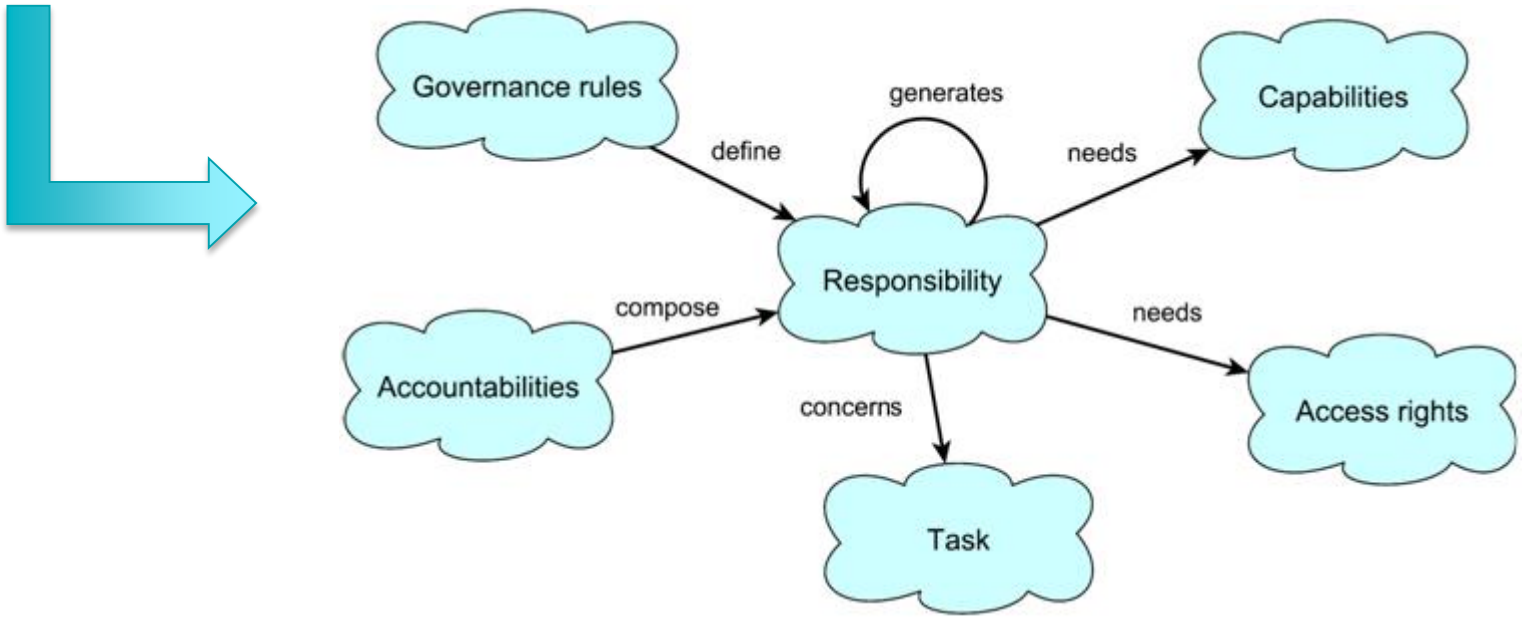


- **Access rights management tends to consider business concepts**
- **Governance needs require to provide accurate access rights**
- **Responsibility is perceived as an hyphen between both worlds**

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

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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

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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

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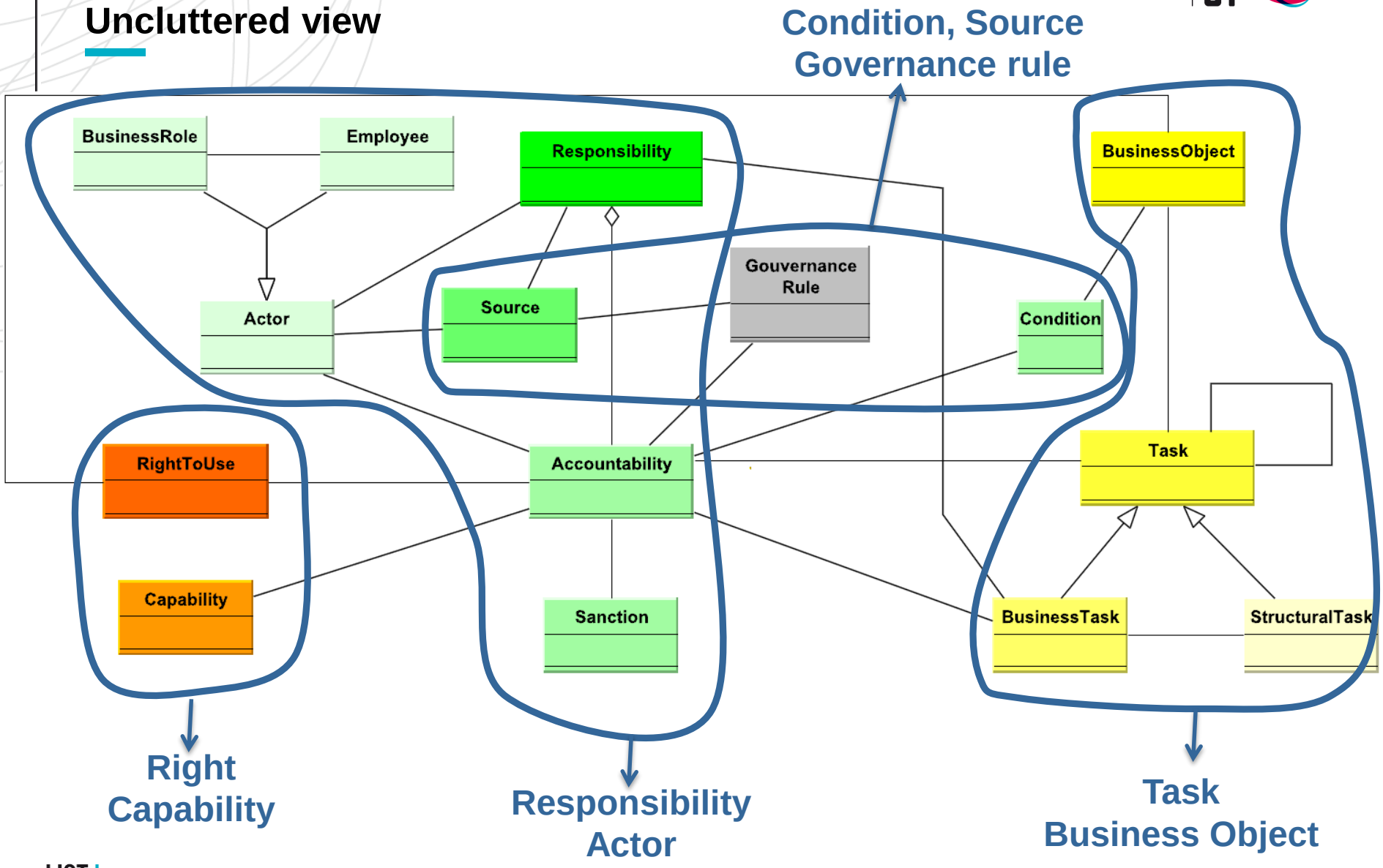
Uncluttered view



RESPONSIBILITY METAMODEL

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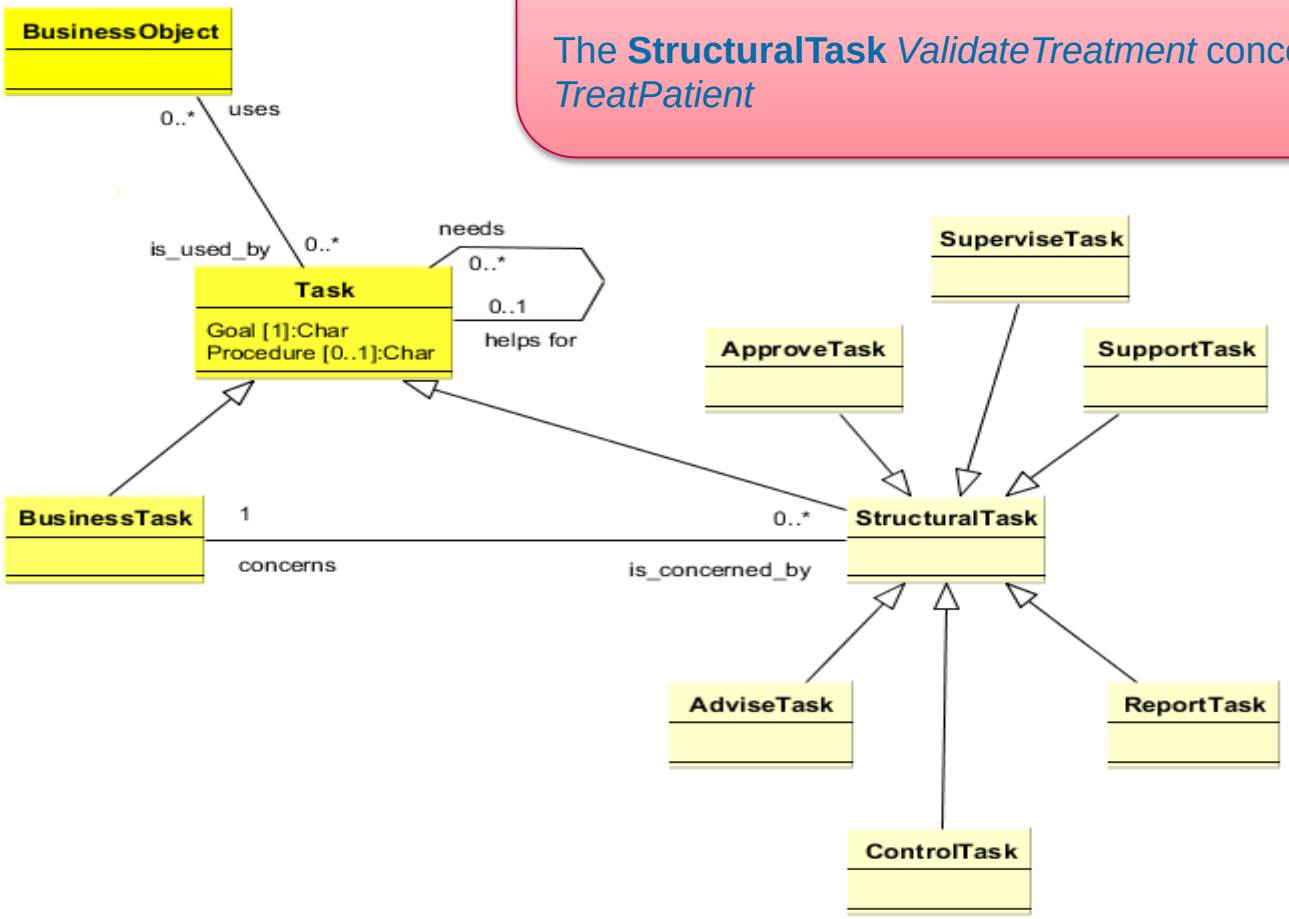
Task and Business object

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

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

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



RESPONSIBILITY METAMODEL

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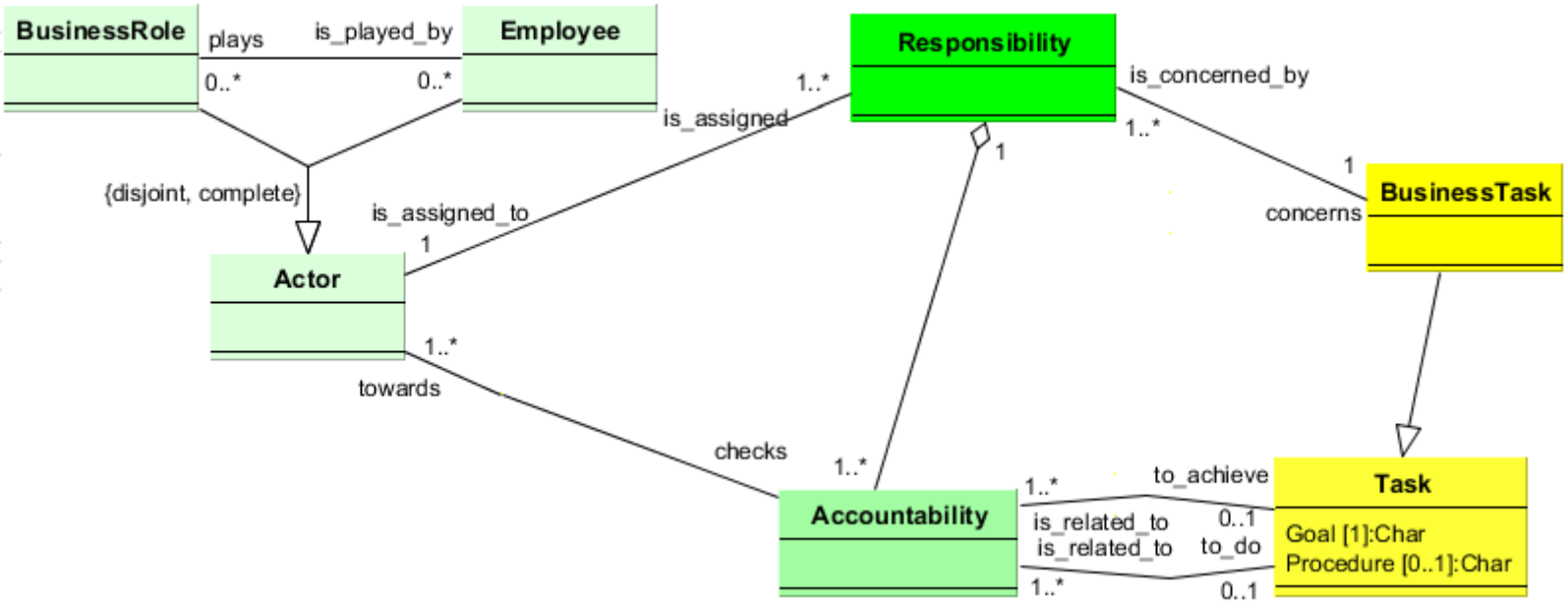
Actor, Responsibility, Accountability



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*

RESPONSIBILITY METAMODEL

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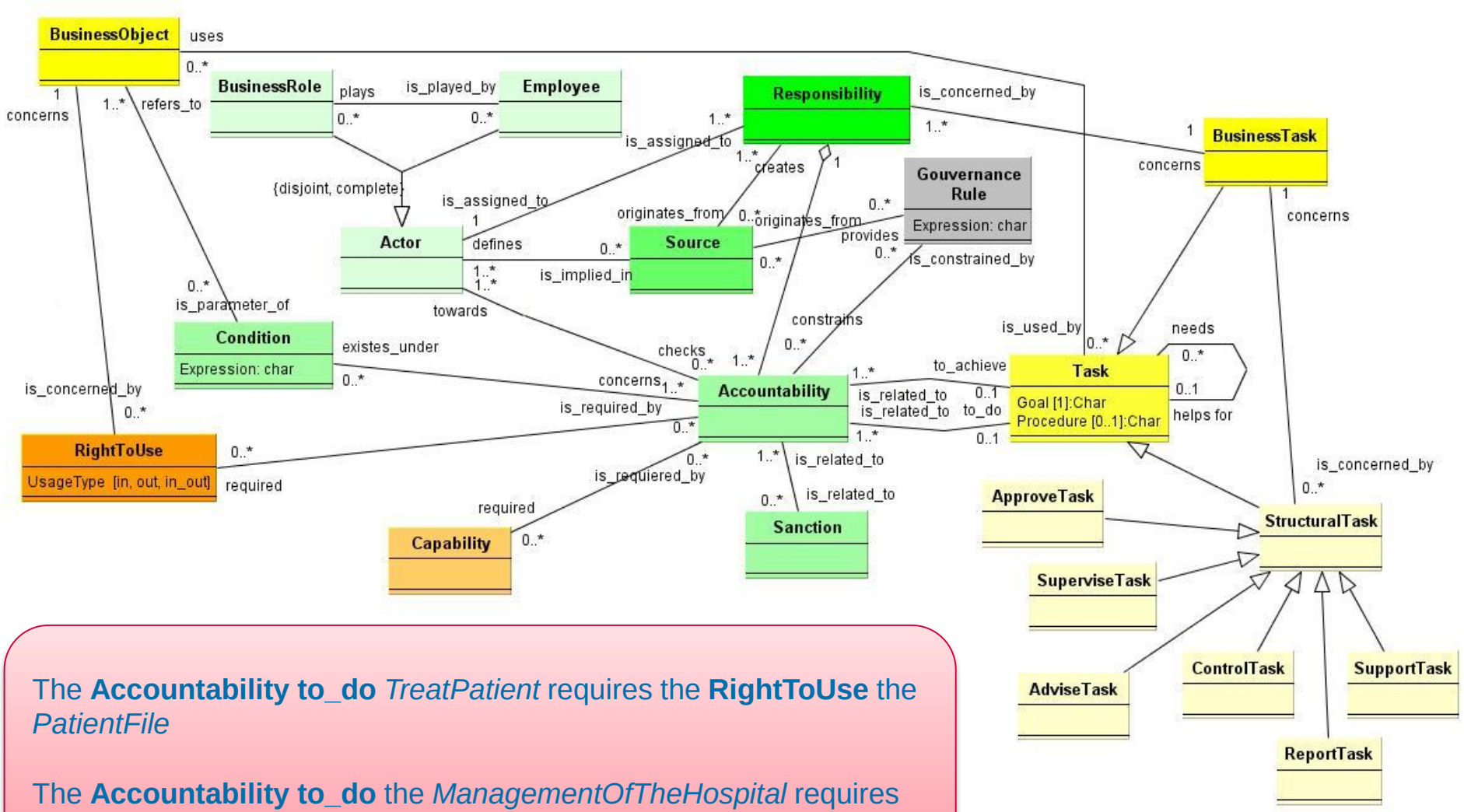

The **Accountability to_do** *TreatPatient* requires the **RightToUse** the *PatientFile*

The **Accountability to_do** the *ManagementOfTheHospital* requires the **Capability** to *Manage a team*

RESPONSIBILITY METAMODEL

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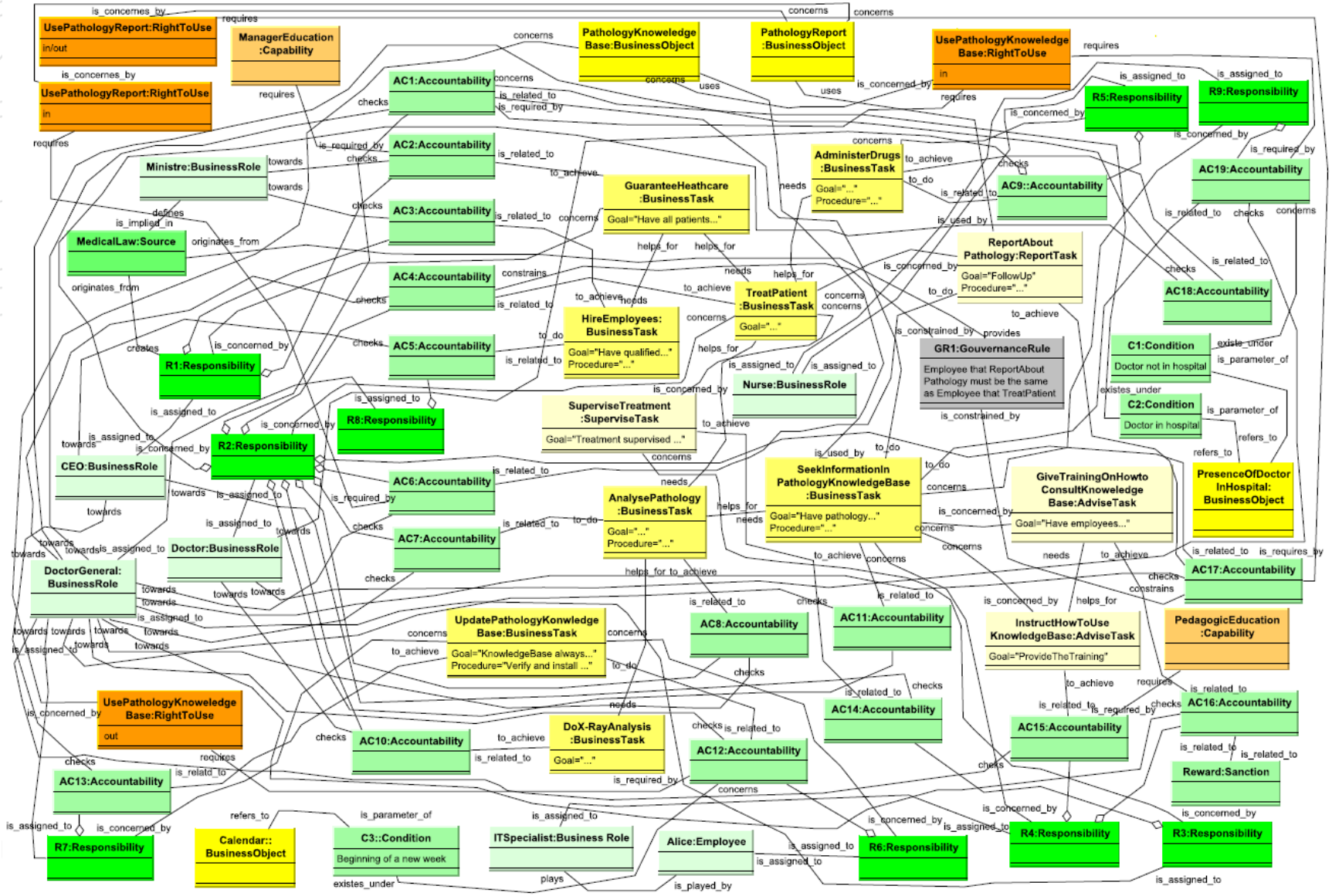
Healthcare case study



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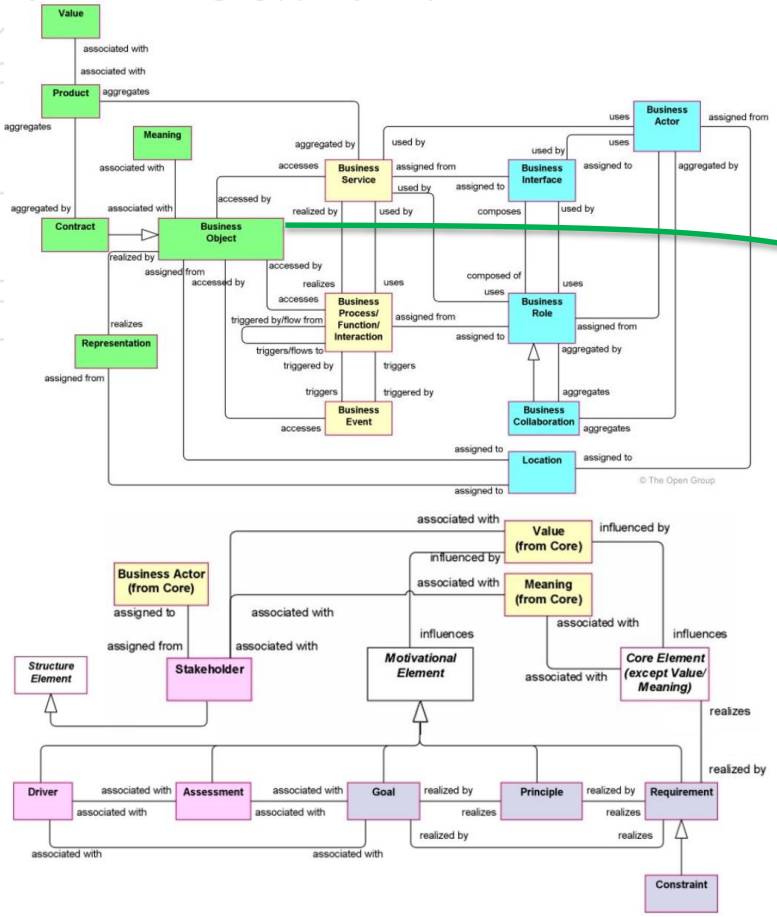
ARCHIMATE EXTENSION

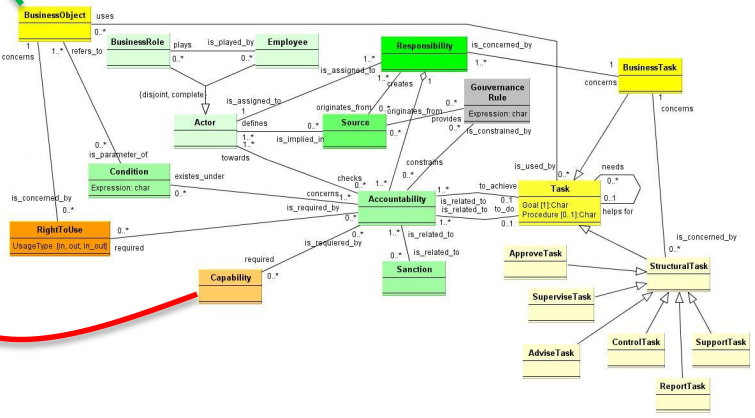
Type of mappings



n-m mapping

1-1 mapping

No mapping



ARCHIMATE EXTENSION

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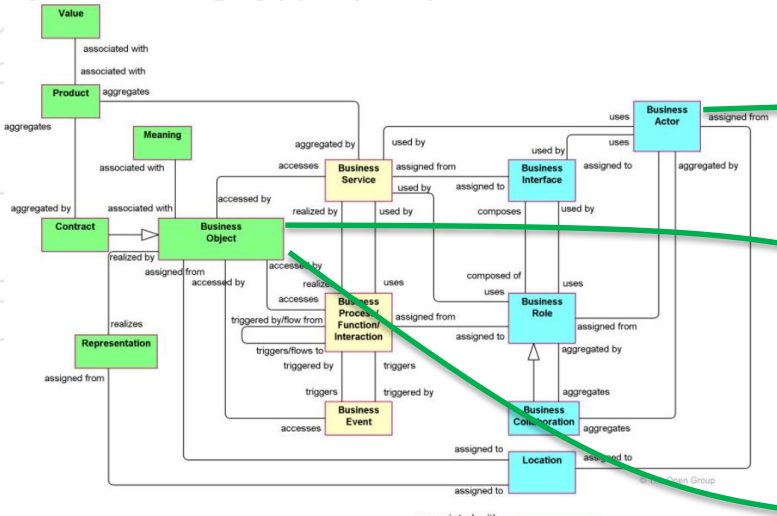
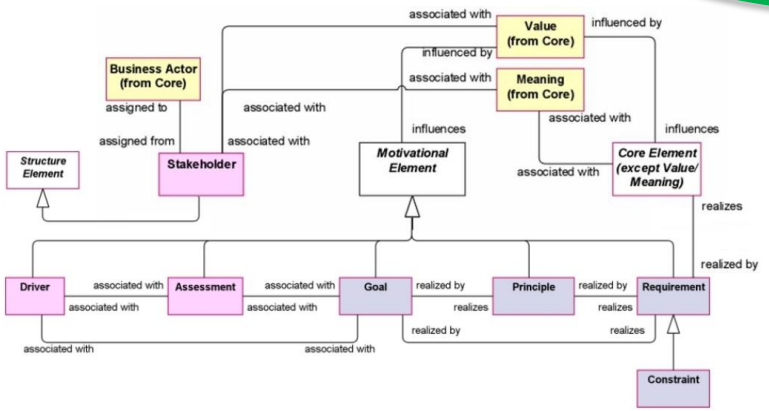
Metamodel Integration

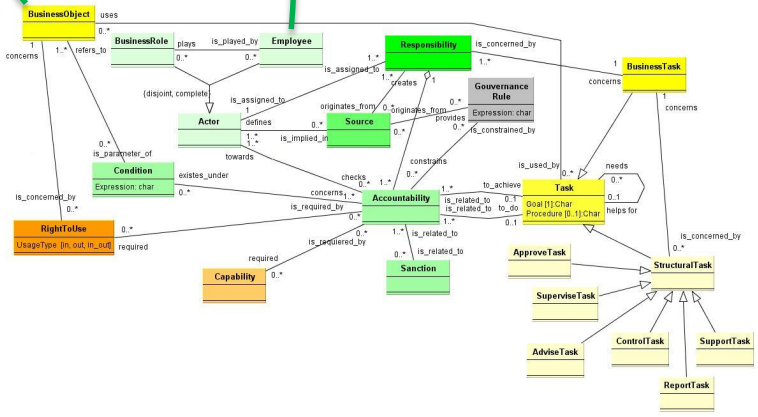




specialisation

1-1 mapping

merge



ARCHIMATE EXTENSION

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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

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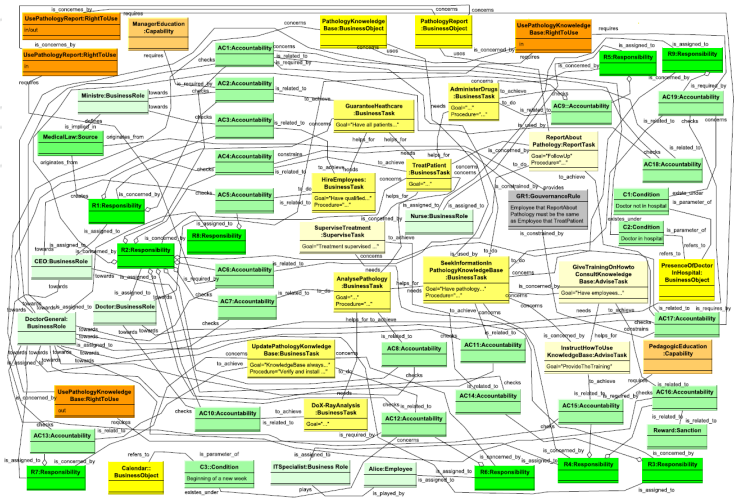
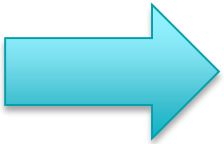
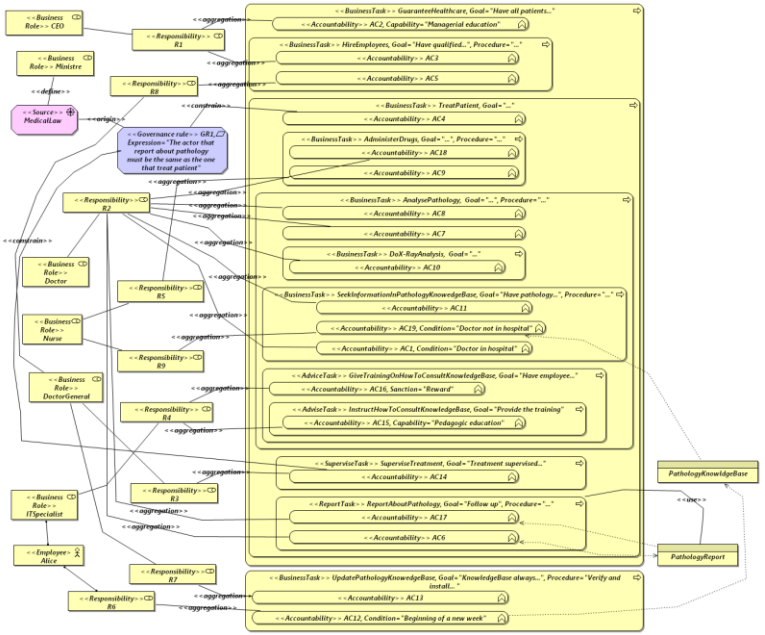
Illustration







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AR MANAGEMENT METHOD

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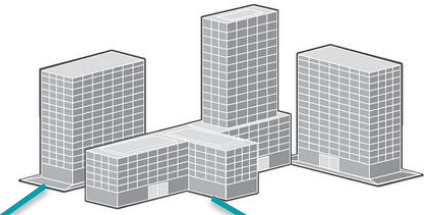
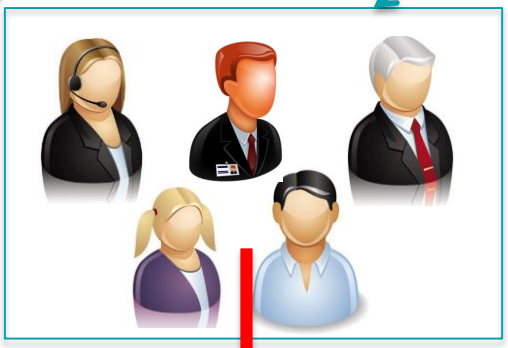
Principle

Business Layer

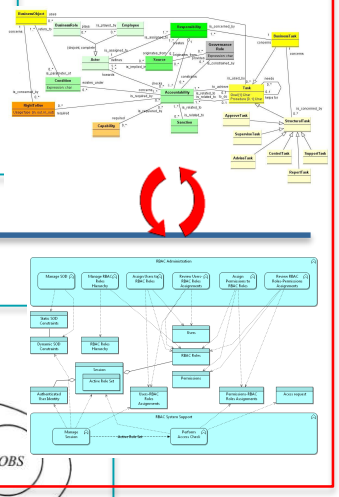
Application Layer

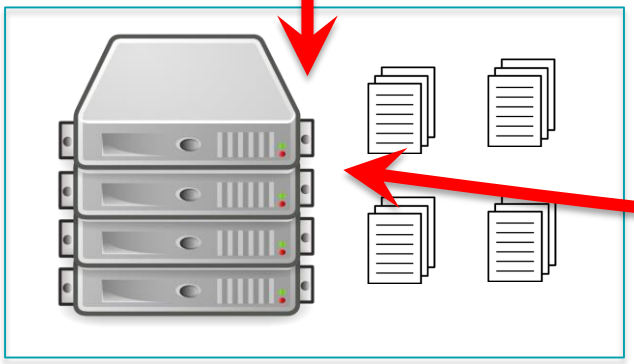


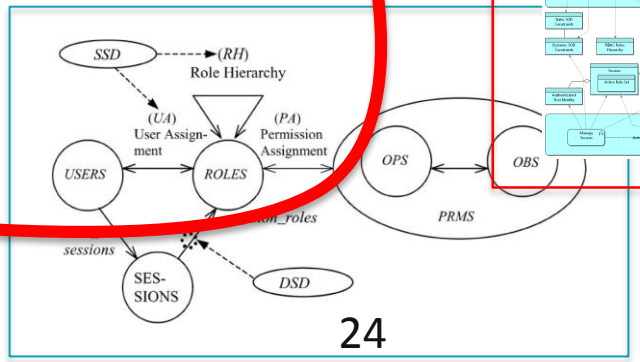


Responsibilities
Responsibilities
Responsibilities
Responsibilities

ArchiMate







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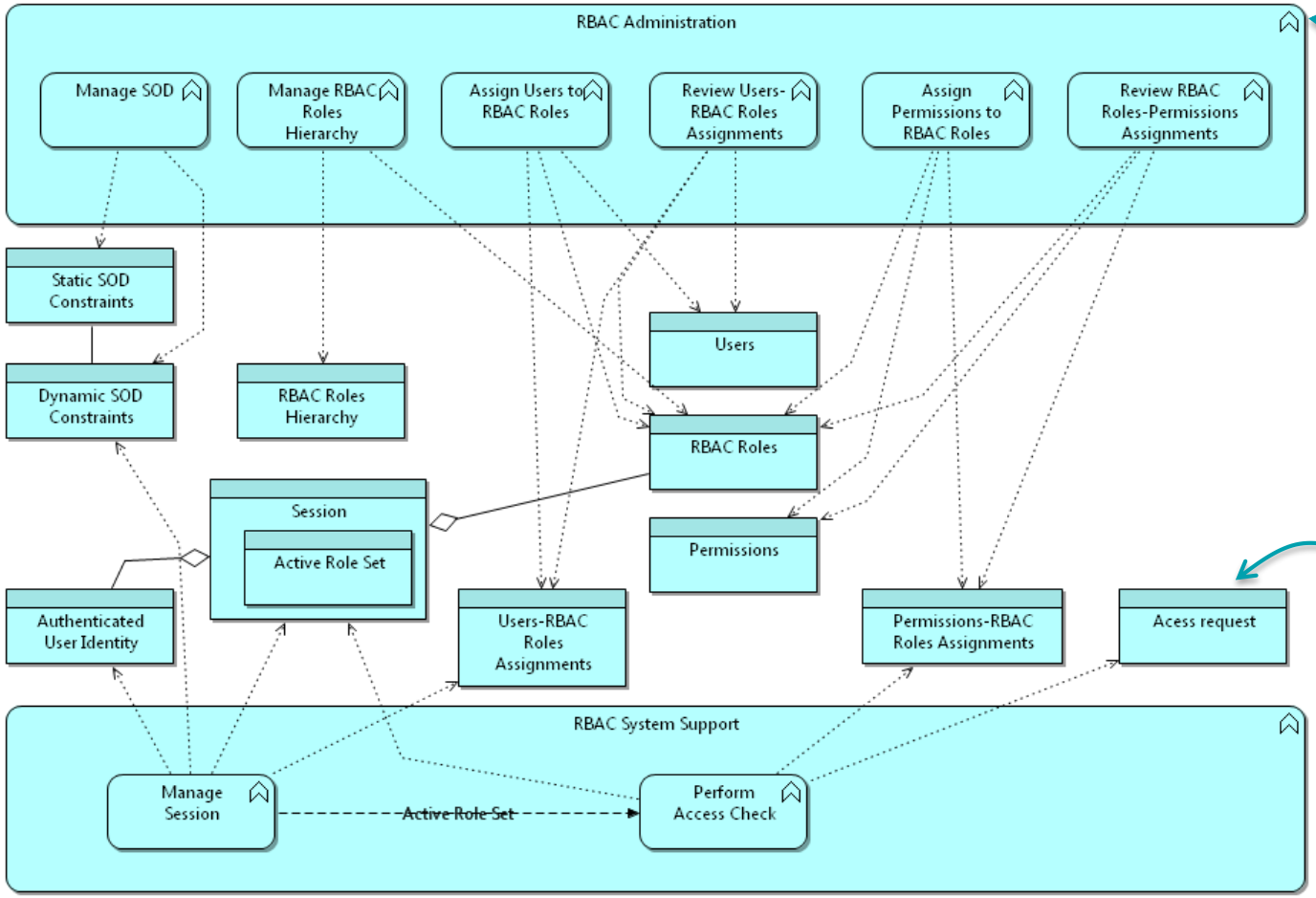
Existing *RBAC reference model* in ArchiMate, *Band (2011)*



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

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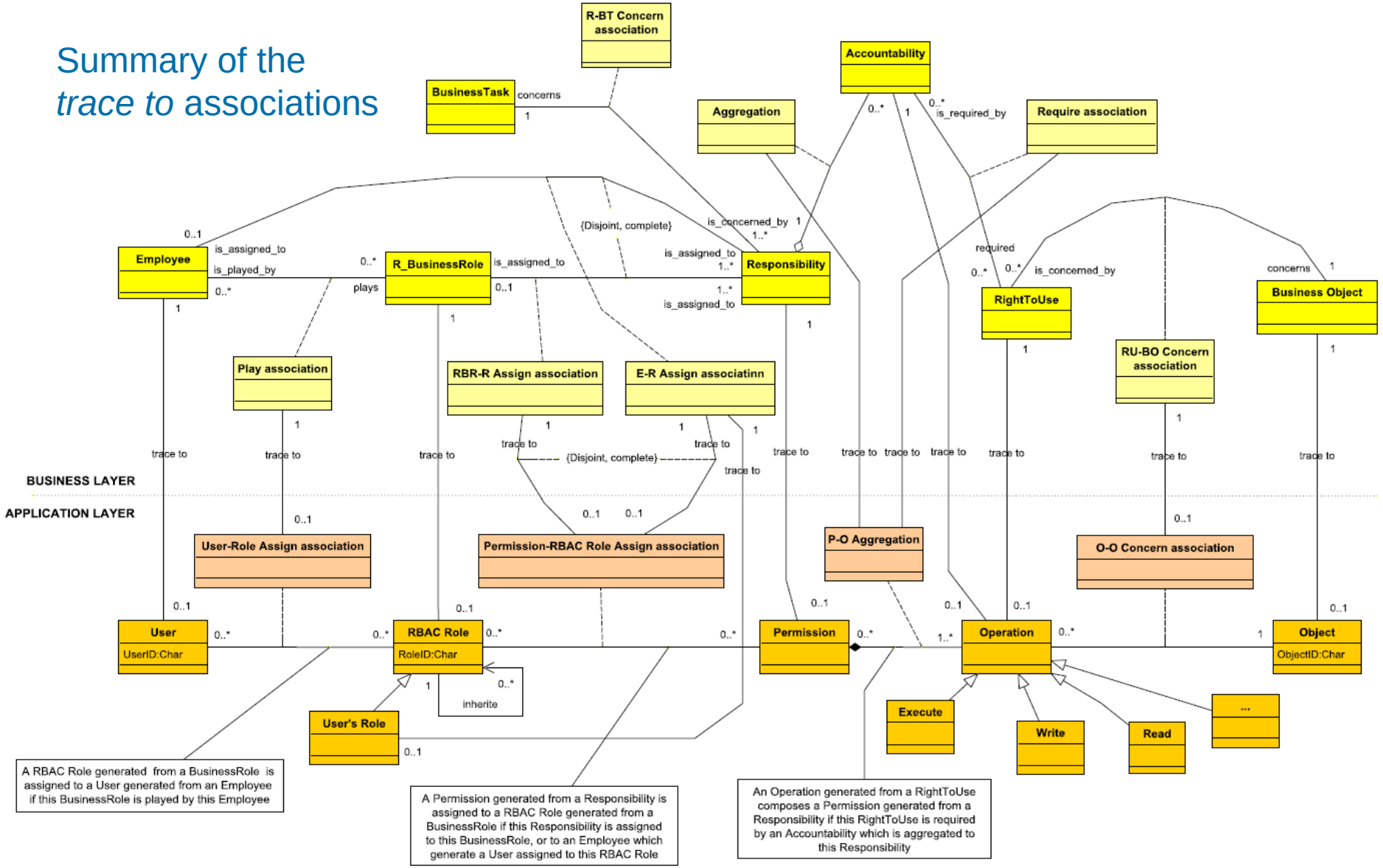
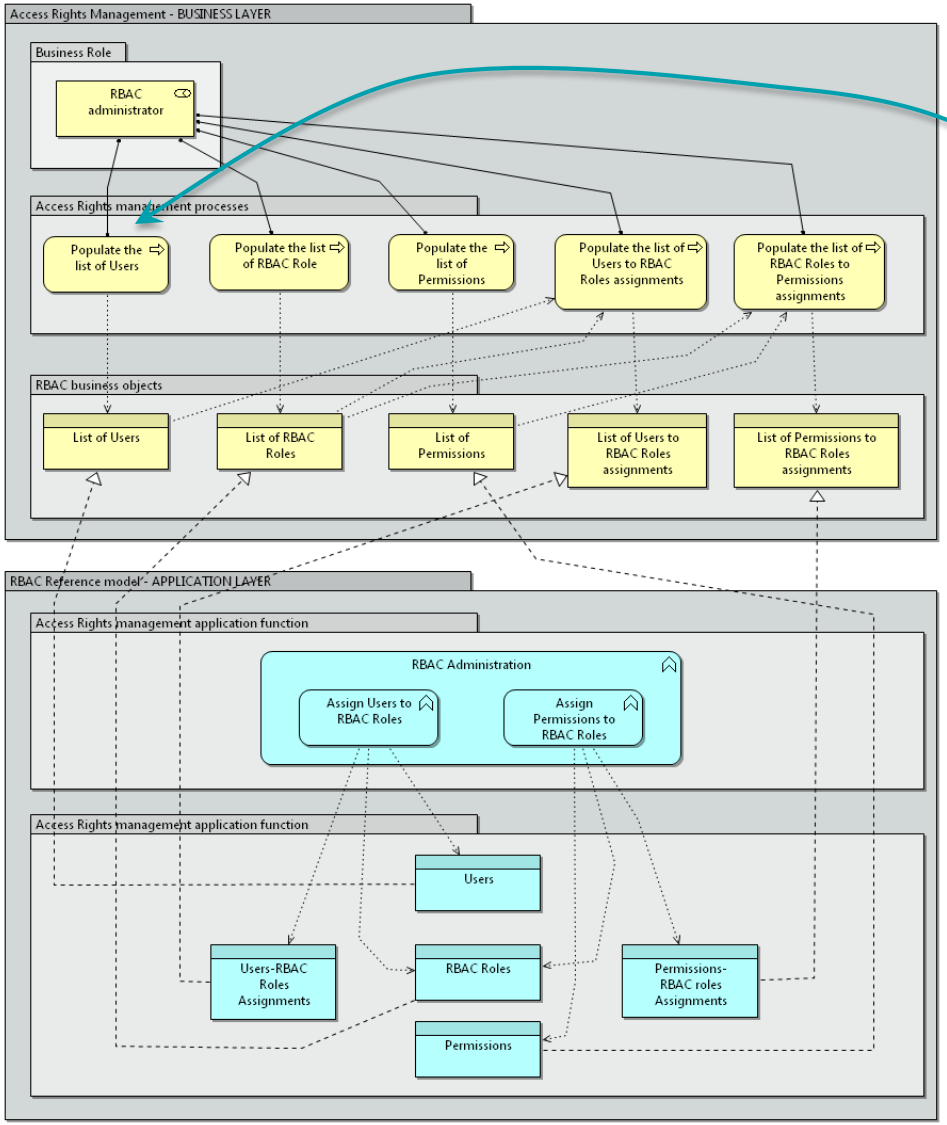
Responsibility-RBAC alignment

Summary of the *trace to* associations



AR MANAGEMENT METHOD

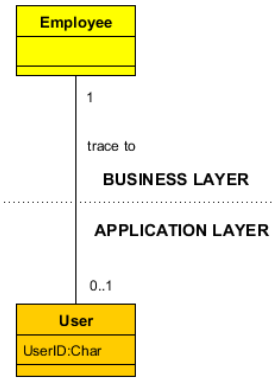
AR Management Reference Model



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

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- 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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REFERENCES

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