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# ASDENCA 2015

Towards Systemic Risk Management in the frame of  
Business Service Ecosystem

Christophe Feltus, François-Xavier Fontaine, Eric Grandry

LUXEMBOURG  
INSTITUTE  
OF SCIENCE  
AND TECHNOLOGY



# OUTLINE

## ➤ **The challenge**

Introducing the case study  
The involved actors

## ➤ **The solution**

The domain metamodel  
The risk metamodel  
The ArchiMate language

## ➤ **How it works**

Paper files archiving services  
Regulated Support-PFS services

## ➤ **Conclusion and future work**

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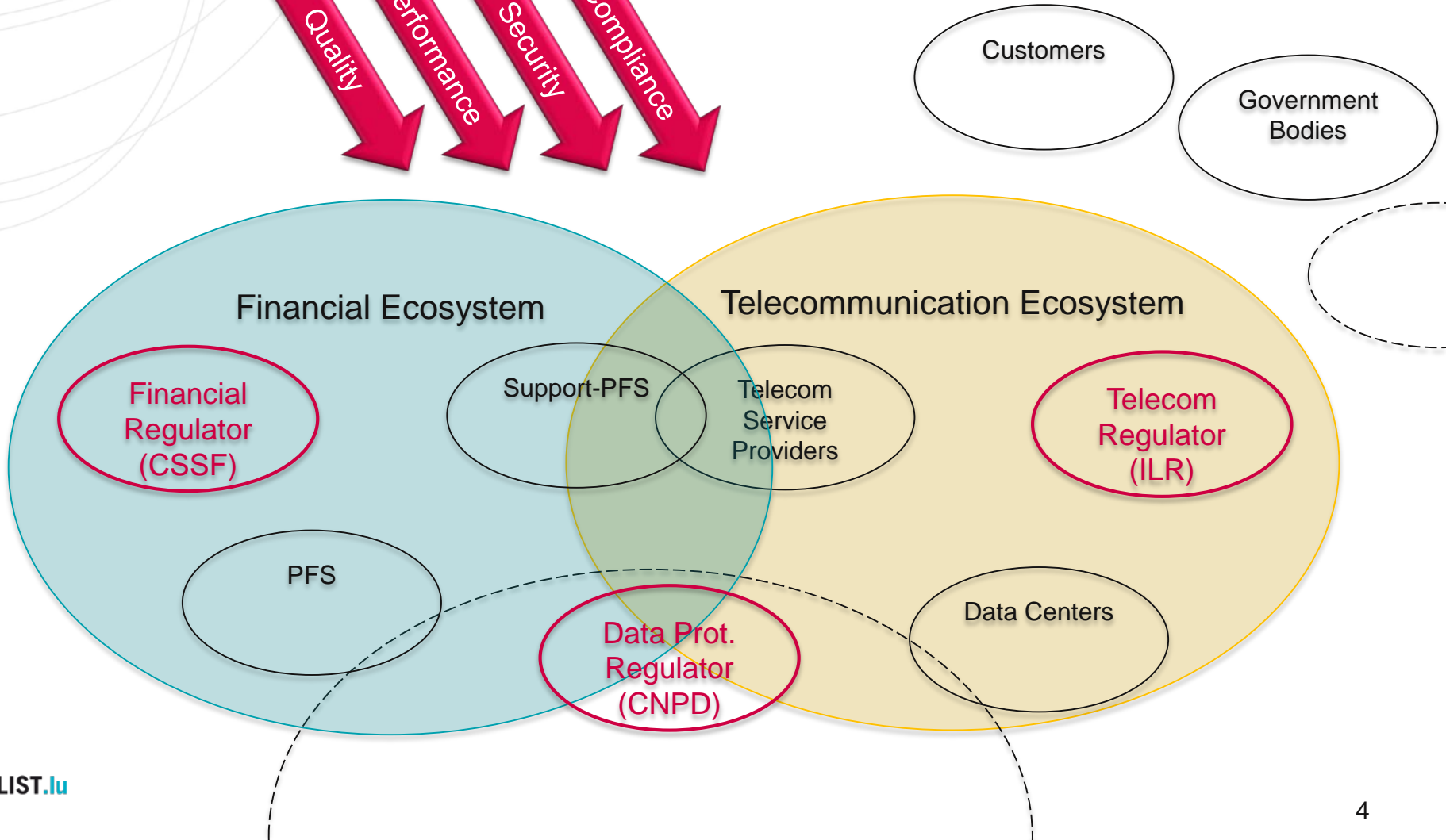
Paper files archiving services  
Regulated Support-PFS services

## ➤ **Conclusion and future work**

# INTRODUCTION

## Business Service Ecosystem

# Trust!



# THE CASE STUDY

In July 2012, the circular CSSF 12/544 “Risk Based Approach” was released. Within the CSSF mission of protecting the stability of the financial sector and guaranteeing compliance with the applicable financial regulation, the aim of the circular is to **optimise the supervision framework** applicable to the Support-PFS by introducing the concept of “**Risk Based Approach**”.

## Key points :

- The development and implementation of a specific **risk management system** within the Support-PFS
- The **self-assessment** of the entity’s risks
- The issuance of an annual **Risk Analysis Report** to the CSSF
- The issuance of an annual **Descriptive Report** to the CSSF



*Commission de Surveillance  
du Secteur Financier*

# THE ACTORS

## CSSF



The Commission de Surveillance du Secteur Financier is a public institution which supervises the professionals and products of the Luxembourg financial sector. It supervises, regulates, authorises, informs, and, where appropriate, carries out on-site inspections and issues sanctions. Moreover, it is in charge of promoting transparency, simplicity and fairness in the markets of financial products and services and is responsible for the enforcement of laws on financial consumer protection and on the fight against money laundering and terrorist financing.

For more information: [www.cssf.lu](http://www.cssf.lu)

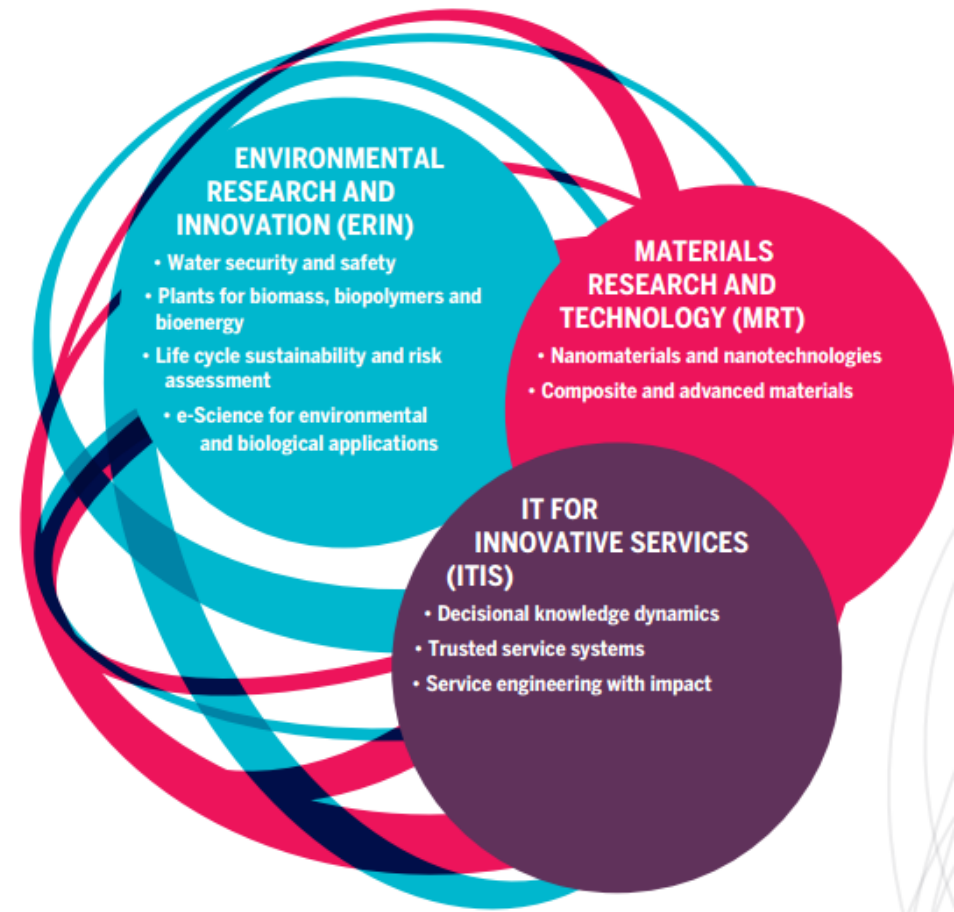


# THE ACTORS

## LIST

A key player in research and innovation in Luxembourg, the Luxembourg Institute of Science and Technology (LIST) covers with its 630 employees the domains of materials, environment and IT. As an RTO (Research and Technology Organisation) and with its interdisciplinary impact-driven approach, LIST contributes to the development of Luxembourg's economy and society.

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# MOTIVATION

## Why did we accept this challenge?

“Any organization where the operational activities of which are financed by external stakeholder may be considered as an enterprise.”

*Source: Capability-Based Business Model Transformation, Martin Henkel, Ilia Bider, Erik Perjons, ASDENCA 2014*

- Extending the frontier of the system beyond the frontier of the enterprise
- Moving towards the systemic risk management

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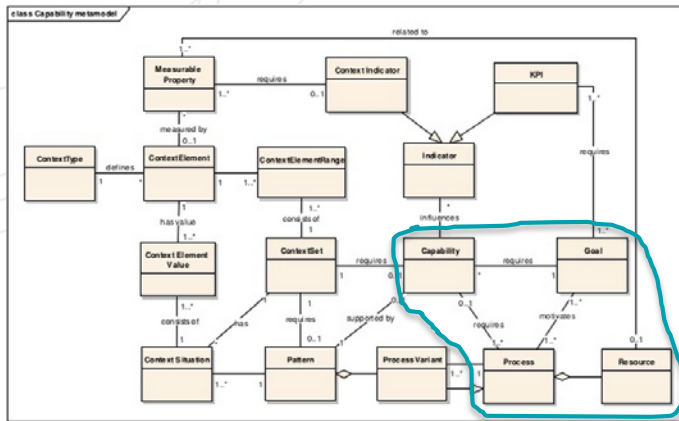
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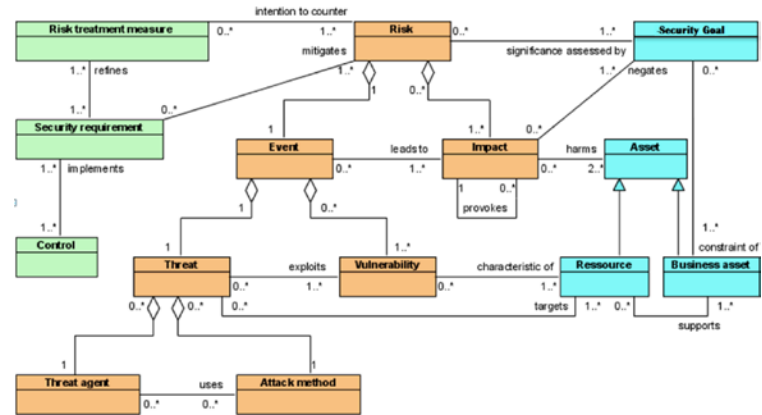
## ➤ **Conclusion and future work**

# SOLUTION

1) A metamodel for modelling the ecosystem capabilities and resources



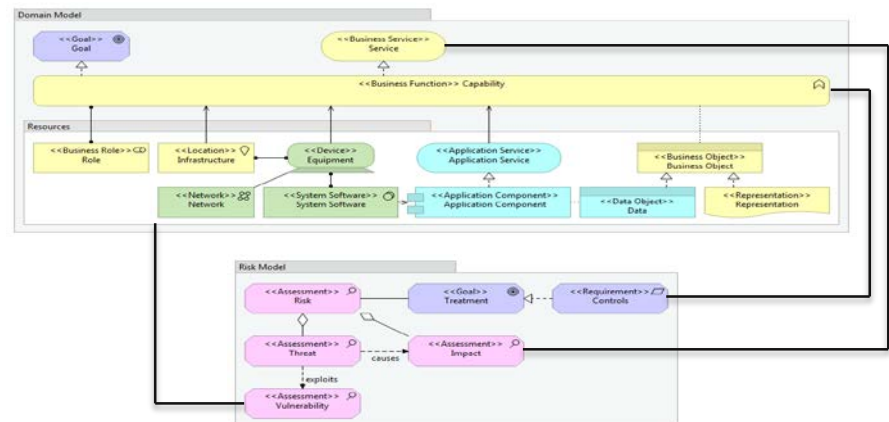
2) A risk management approach based on the ISSRM metamodel



Sandkuhl, K., Koç, H.: *On the Applicability of Concepts from Variability Modelling in Capability Modelling: Experiences from a Case in Business Process Outsourcing, ASDENCA 2014, Greece*

Mayer, N., Heymans, P., Matulevicius, R.: *Design of a Modelling Language for Information System Security Risk Management, RCIS, 2007*

3) A language to sustain the systemic risk management



Grandry, E., Feltus, C., Dubois, E.: *Conceptual Integration of Enterprise Architecture Management and Security Risk Management, SOEA4EE, EDOC WS, 2013*

# MODELLING THE ECOSYSTEM

## Business Service Ecosystem (BSE) Metamodel

### Capability:

The ability and capacity that enable an enterprise to achieve a business goal in a certain context. (A: the ability to regulate the ecosystem) (B: capacity to provide financial advice)

### Resource:

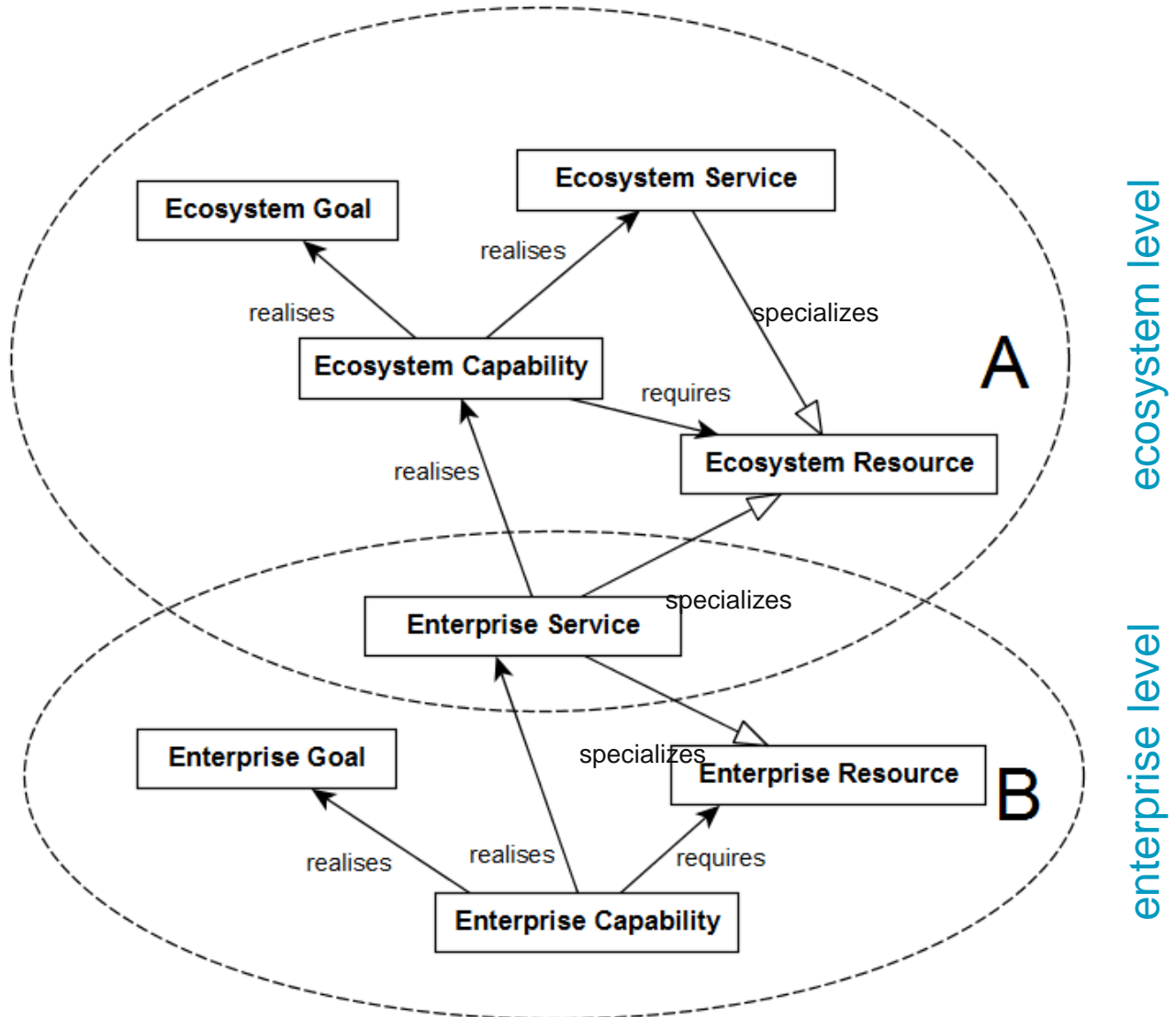
An asset that an organization has or can call upon. (A: employees that manage the ecosystem) (B: financial asset management software)

### Goal:

A desired state of affairs that needs to be obtained. (A: guarantee the delivery of secure financial services) (B: make profits)

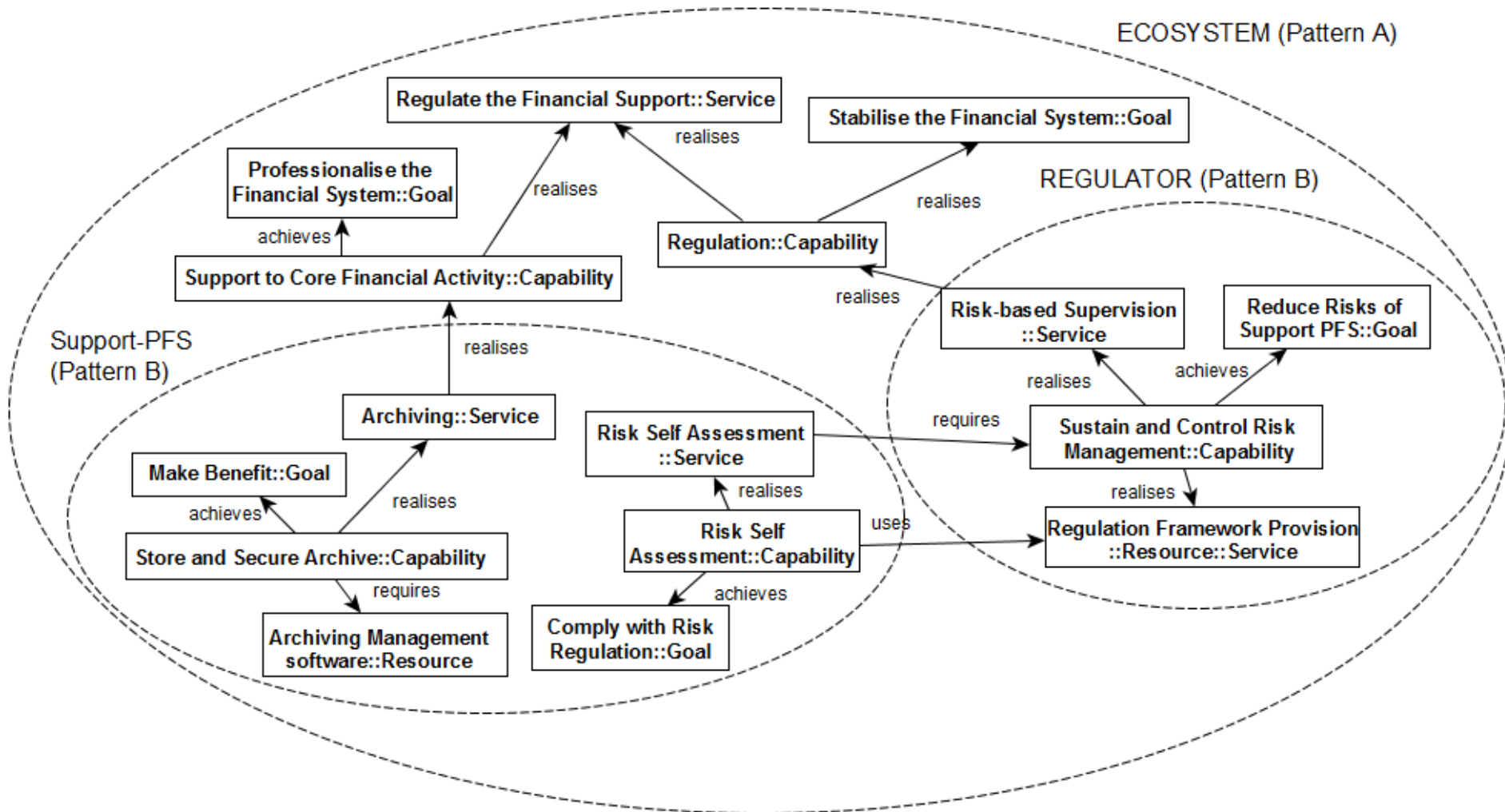
### Service:

Acts performed for others, including the provision of resources that others will use.

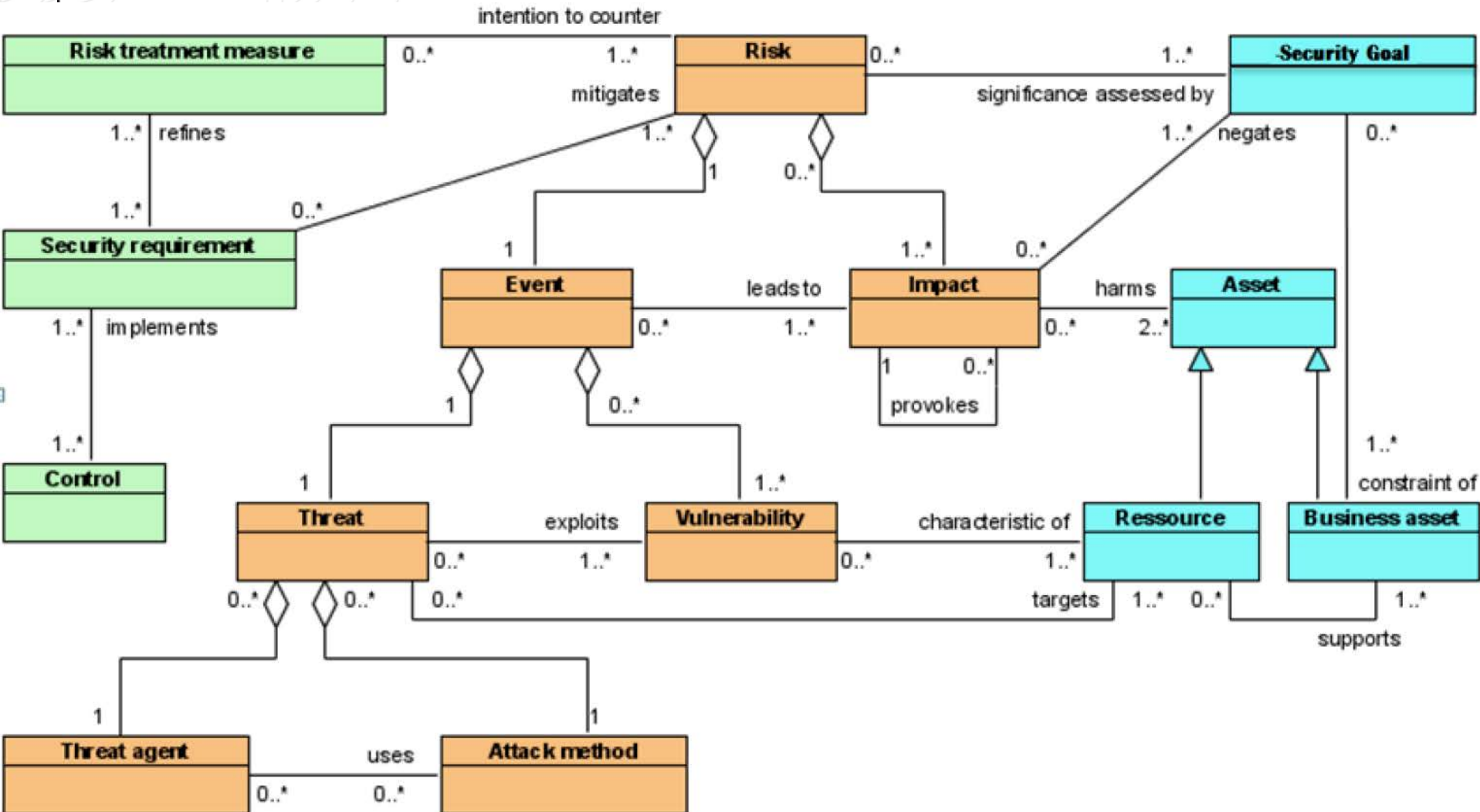


# MODELLING THE ECOSYSTEM

## BSE instantiated to the financial ecosystem

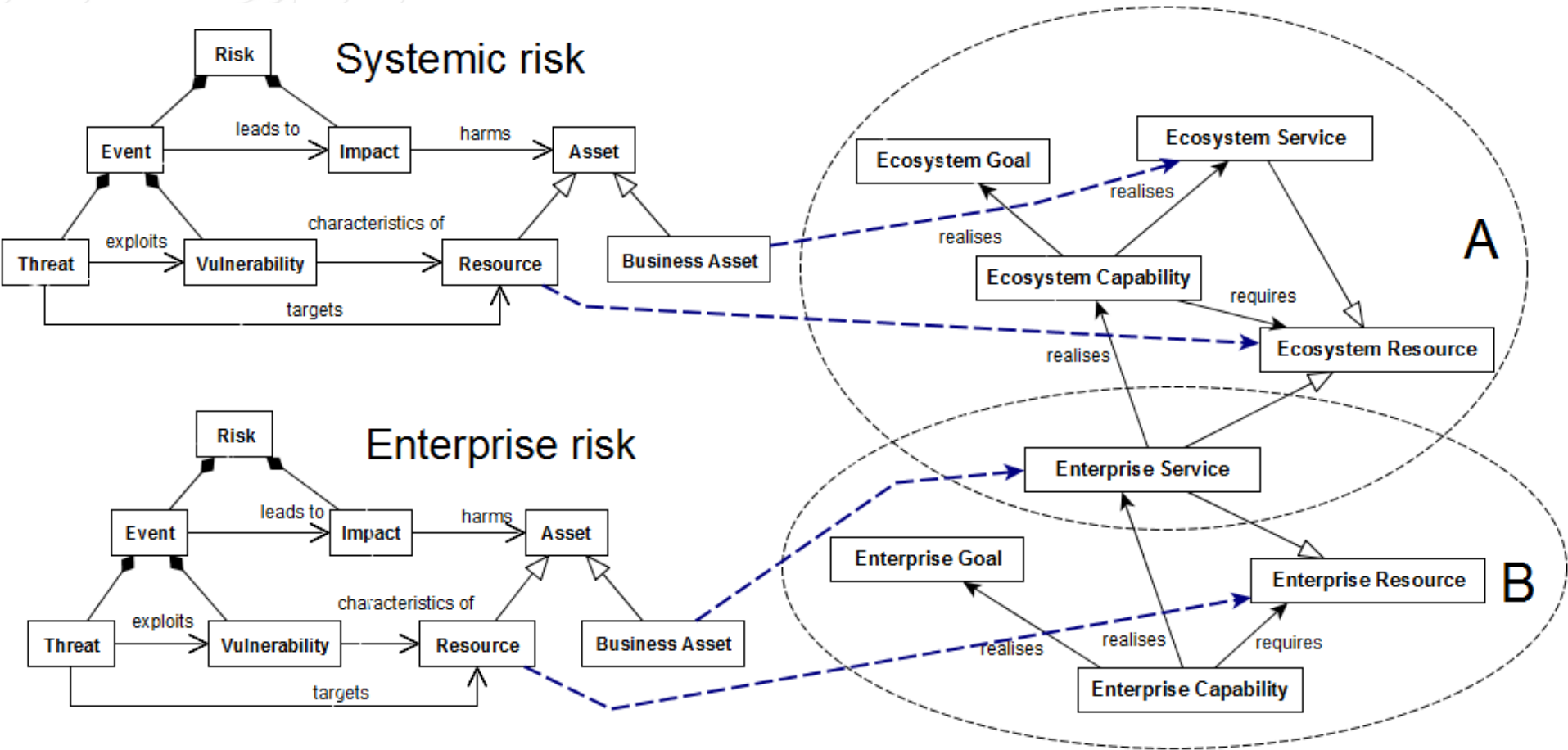


## Information System Security Risk Management Model

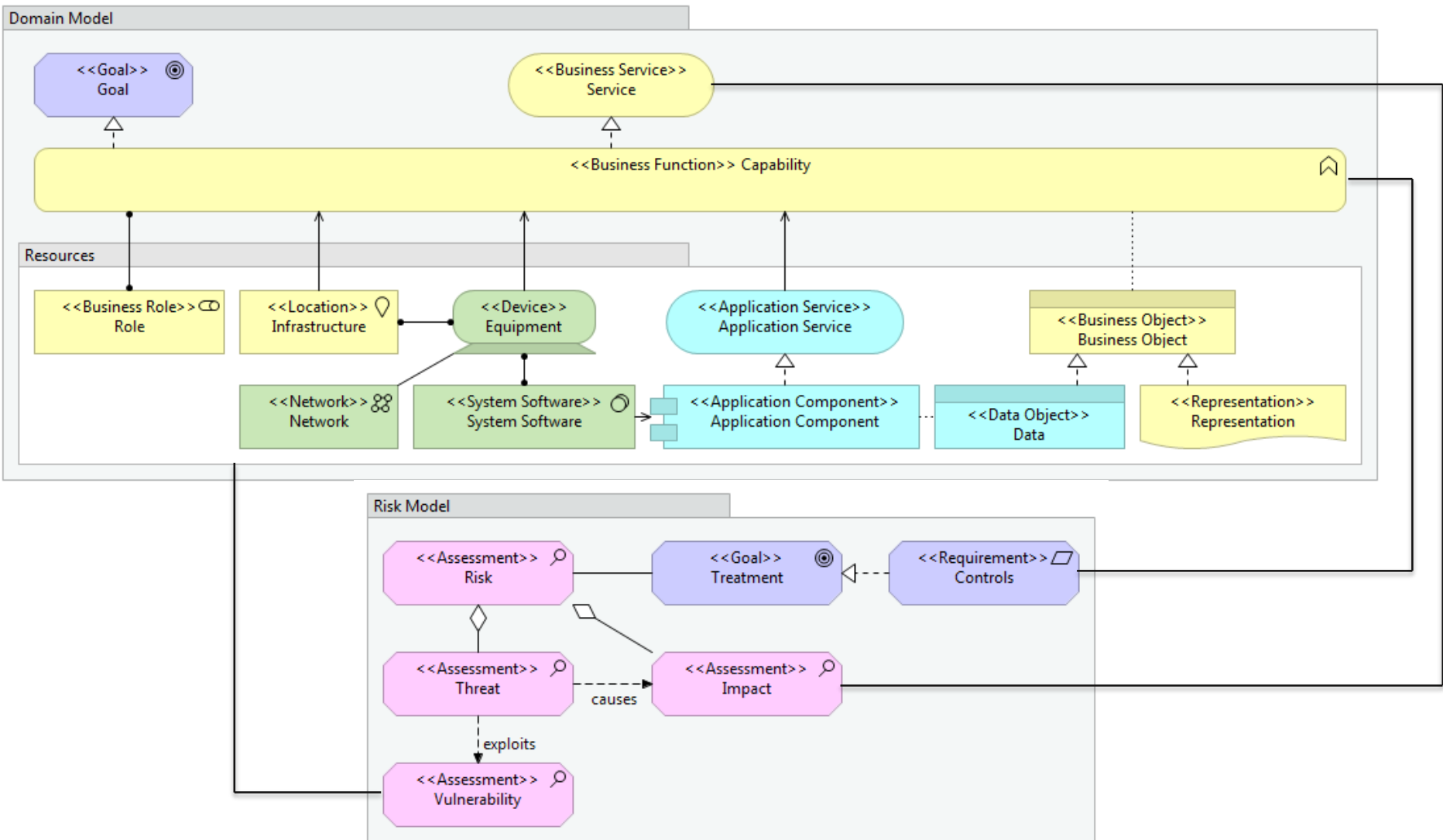


# MODELLING THE RISKS

## Mapping ISSRM – BSE metamodel



# ARCHIMATE LANGUAGE





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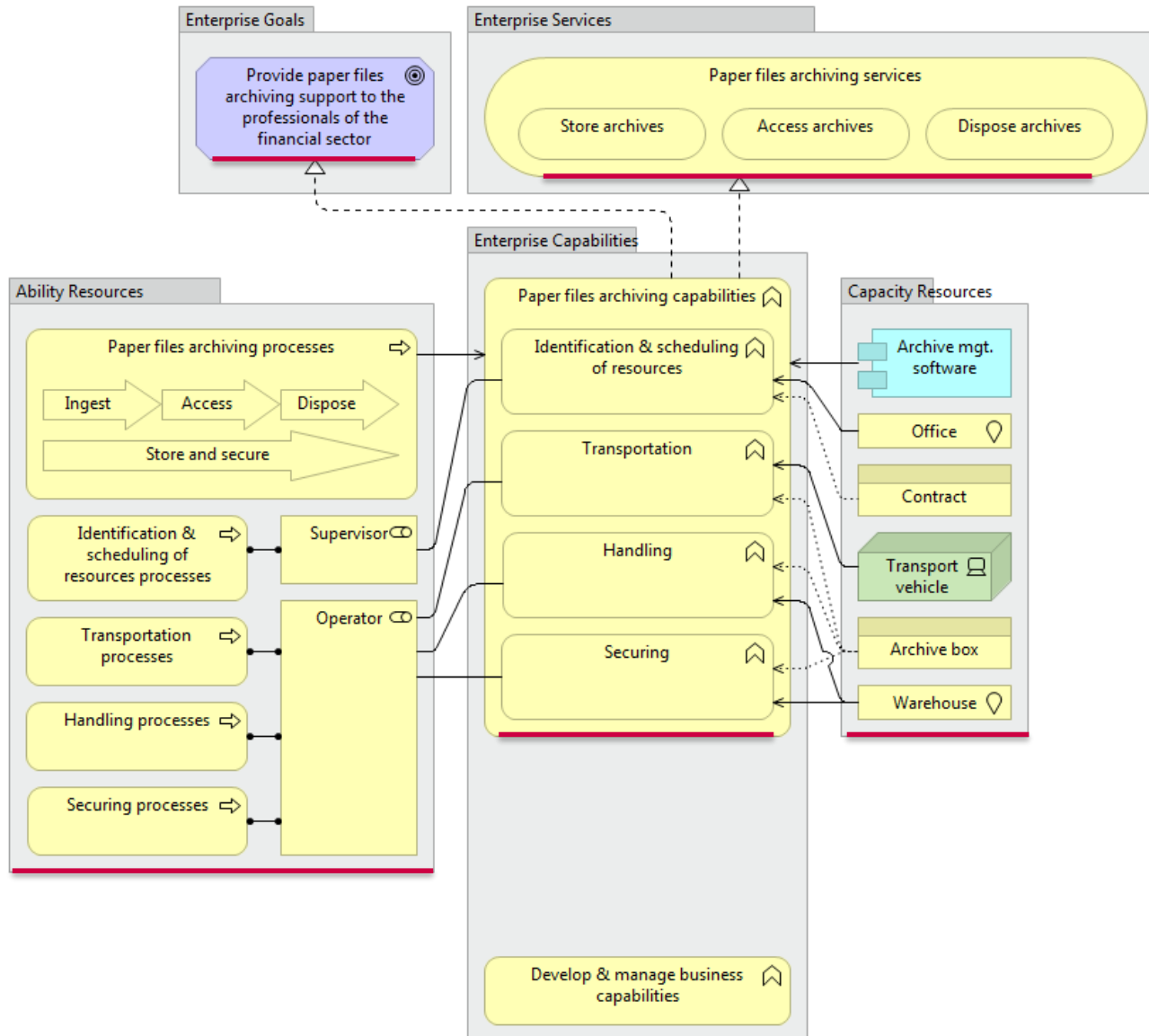
Paper files archiving services

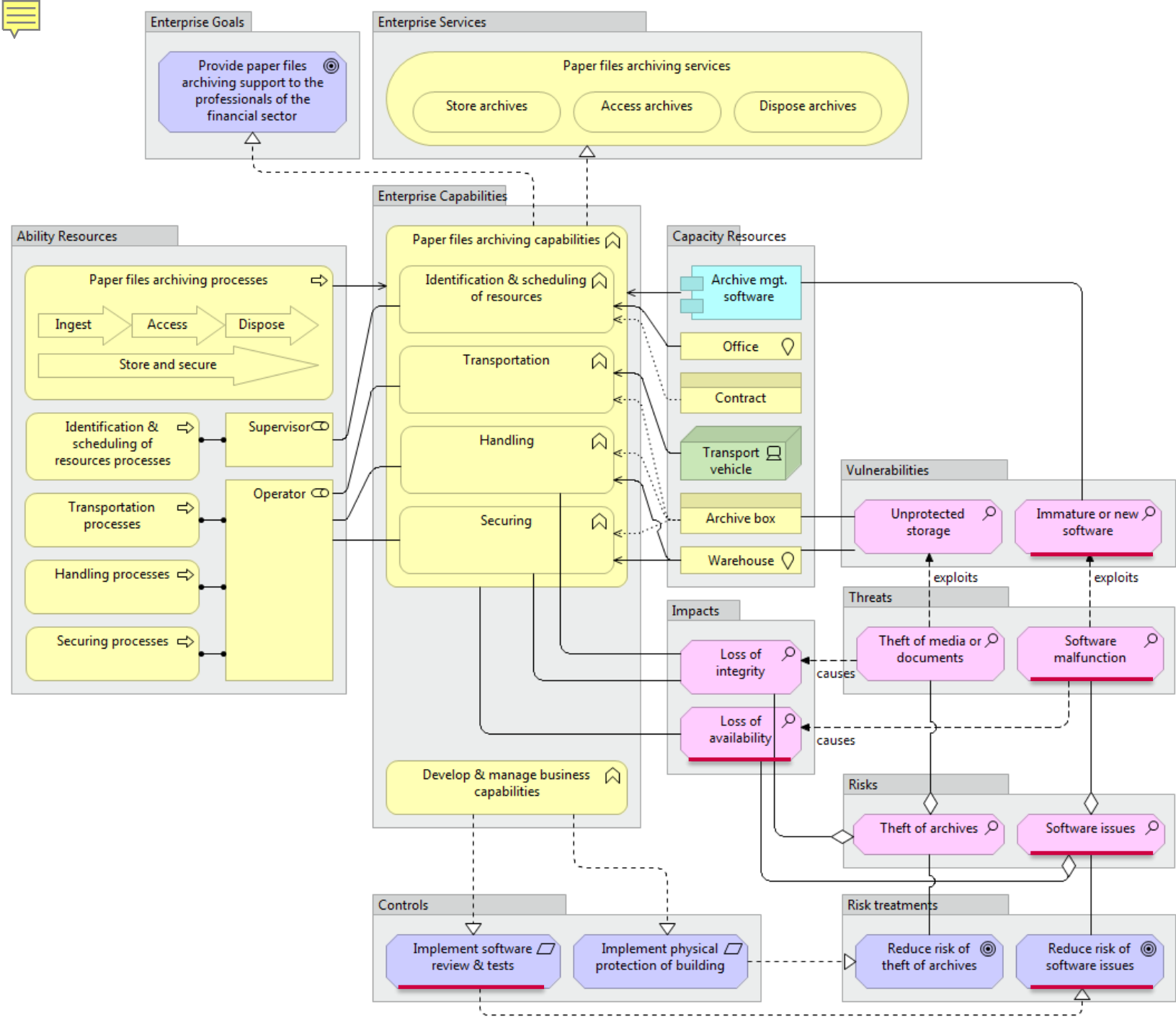
Regulated Support-PFS services

## ➤ **Conclusion and future work**

# ENTERPRISE RISK LANGUAGE

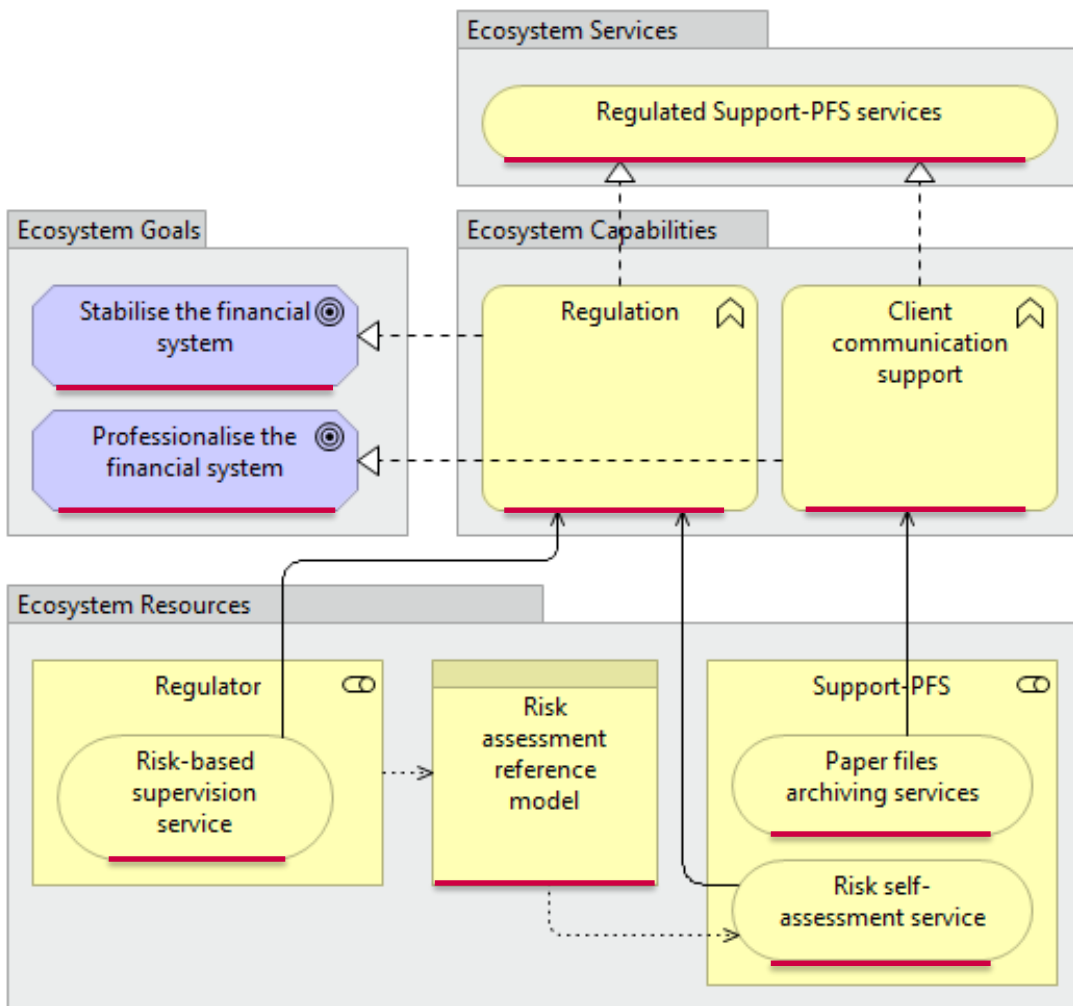
## Use case: Paper files archiving services





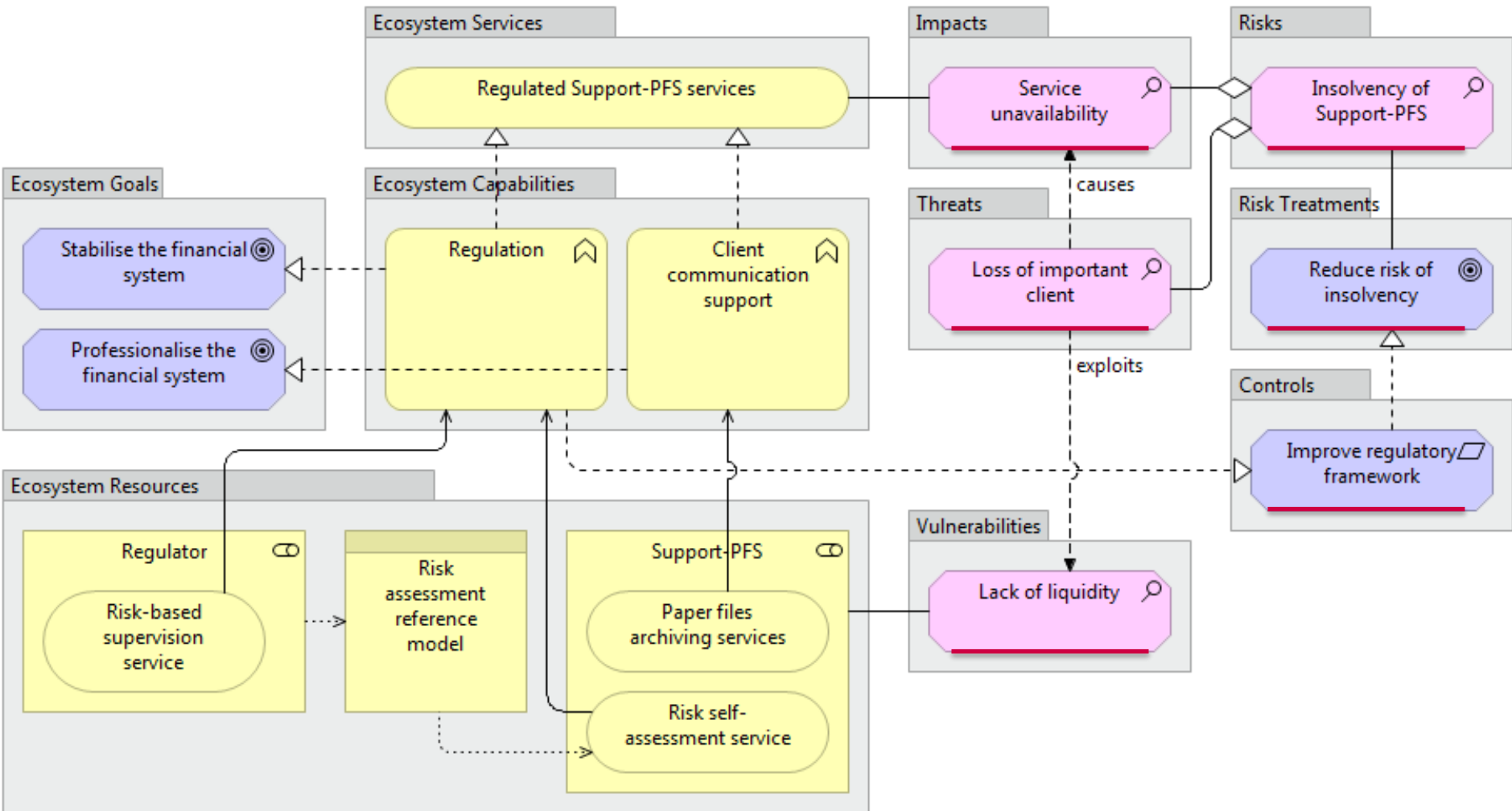
# SYSTEMIC RISK LANGUAGE

## Use case: Regulated Support-PFS services



# SYSTEMIC RISK LANGUAGE

## Use case: Regulated Support-PFS services



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# CONCLUSION

## Our contributions

### Risk management at system level:

- The BSE metamodel built from the capability-resource pattern
- The ISSRM – BSE mapping
- The ArchiMate language extension to represent the risk management

### We have demonstrated:

- The use of a few concepts to model a complex ecosystem
- Risk management at enterprise level can be raised at ecosystem level (fractal pattern)
- The Archimate mapping brings a language and the link between risk management and enterprise architecture

# CONCLUSION

## New perspectives and future work

### Future work:

- Deepening the relationship between enterprise risk and systemic risk
- Deepening the role of the service as a hyphen between both levels
- Improving the variability aspect by raising the context to the ecosystem level

### New perspectives:

- Extension to other purposes than risk management (business alignment, process assessment, compliance)
- Extension to systems with many regulators
- Extension outside the boundaries of the ecosystem (link regulators from multiple ecosystems)



# THANK YOU FOR LISTENING

## Questions?

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