

Qualifying, current work, future work



UNIVERSITY
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What can I talk about?!

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- My research proposal
- Current work
 - REFSQ
 - CAISE
 - SEAMS
- Future work



RESEARCH OBJECTIVES

A **tool-supported framework for RE** that will make possible to achieve *legal compliance of software requirements* through a **systematic process** based on **argumentation**

Research objectives

1. A **conceptual framework** for modeling the law and requirements
2. A **tool** for the analysis of **models of the law** to support the design of software requirements
3. An **argumentation-based systematic process** to guide the analyst in the evaluation of (critical) legal issues

Proposal

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DETAILS

A conceptual framework for law and requirements	A tool to support the analysis of the law model	An systematic process based on argumentation
Identify basic concepts	Tool for reasoning over a basic norm model	Preliminary evaluation of the argumentation-based approach
Modeling language for applicability of norms and their compliance		Identify critical issues not supported by the framework-tool
Expand the language to model stakeholder preferences	Include preferences [+ scalability evaluation]	Evaluate type of discussions/ argumentation framework
Expand the language to reason about legal roles [+ preliminary validation]	Include analysis of responsibility and delegations [+ validation]	Identify key steps of the process
Link with a goal-oriented model of requirements [+ validation]	Interface with a tool for designing requirements	Identify how/where the tool and argumentation framework should be included

Proposal

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WHAT HAS BEEN DONE SO FAR

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[1] RIGIM'12
[2] ER'12
[3] REFSQ'13

[4] Journal of Data Knowledge Engineering
[5] submitted to CAISE'13

Proposal

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WORK IN PROGRESS

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Today

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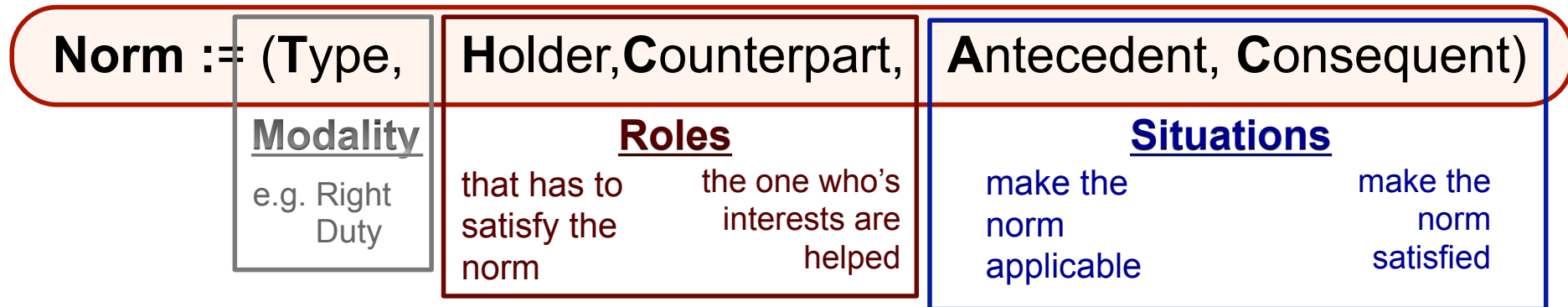
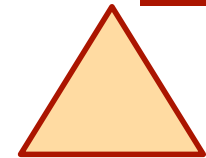
Nomos 2

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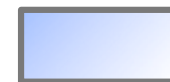


GOALS AND NORMS

Norm is a primitive concept in our modeling language



A **situation** is defined as the neutral concept of partial state of the world.



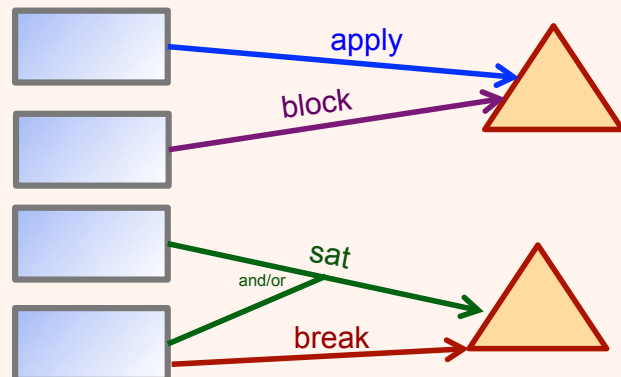
SITUATIONS



NORMS AND SITUATIONS

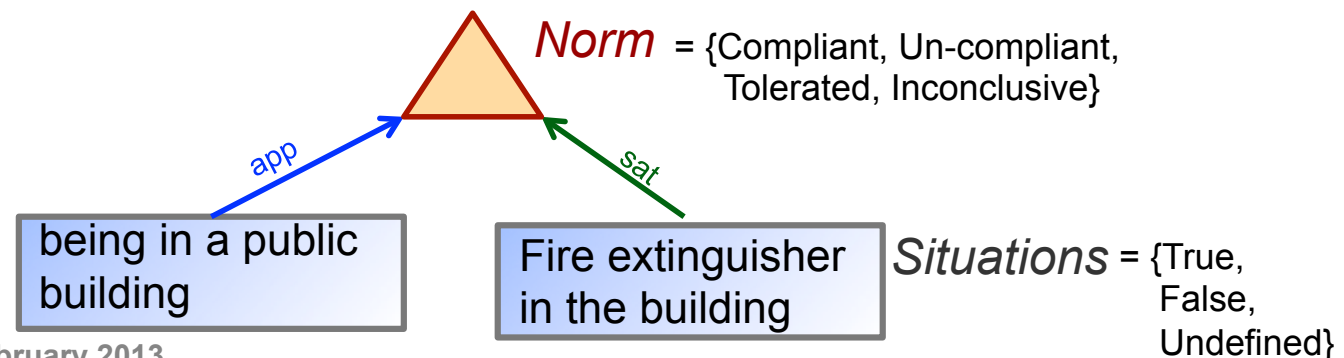
■ How to represent Norms with Situations

Relations (Situation x Norms)



Situation makes **applicable** (or **block**) a norm (e.g. “every *public building* must have fire extinguisher”)

Situation **satisfy** (or **break**) a norm (e.g. “*fire extinguisher in the building*”)

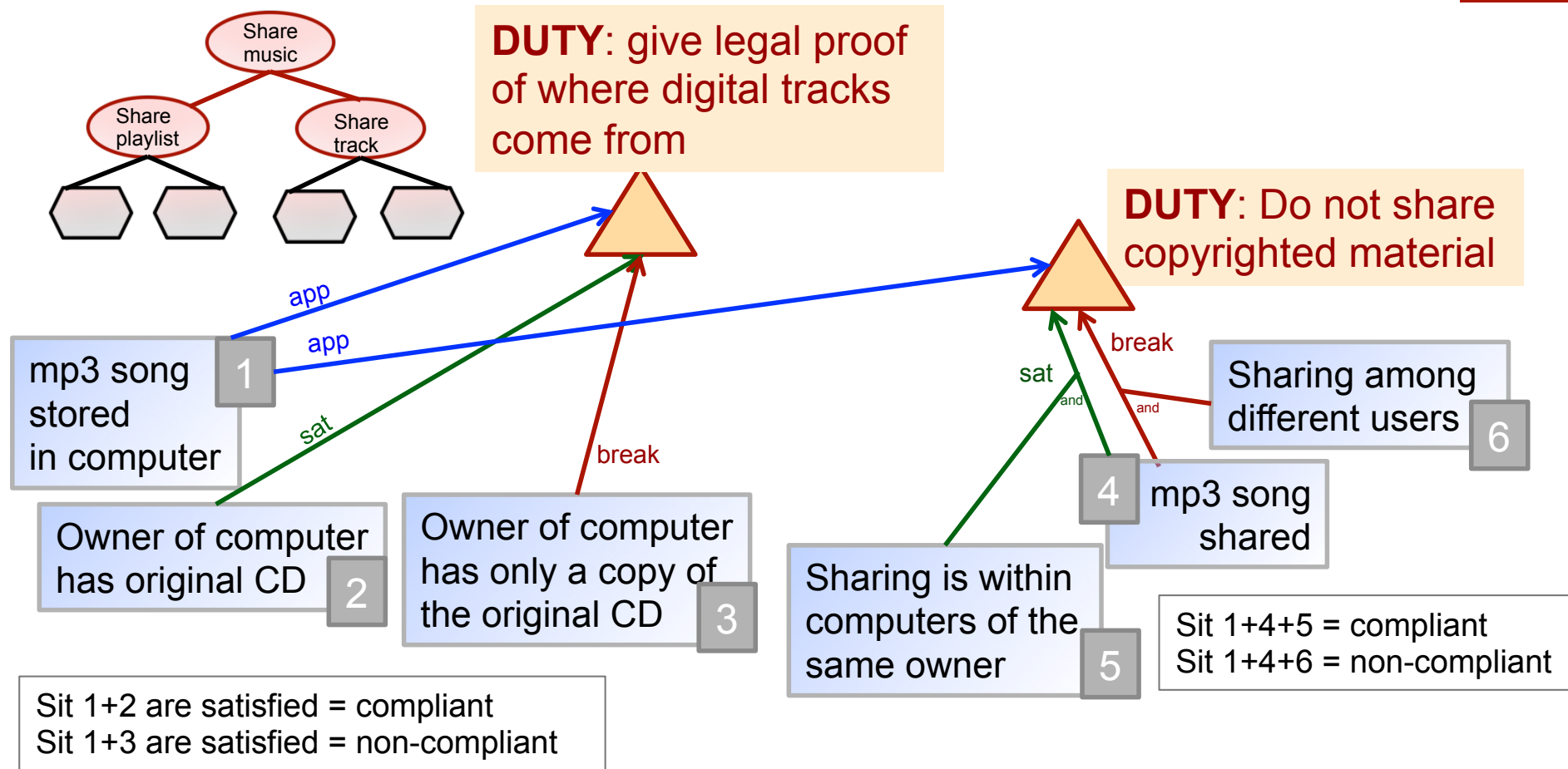


Nomos 2

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EXAMPLE



Today

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FITNESS-TO-NORMS

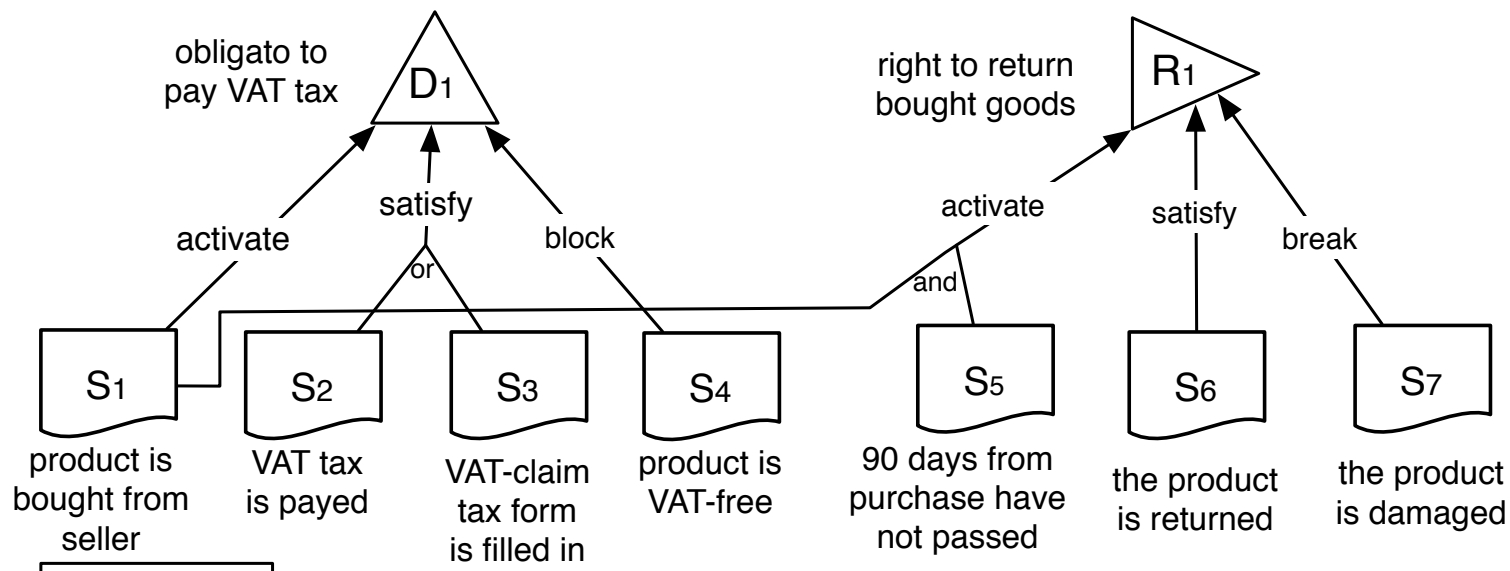
- Software quality: fitness-for-purpose vs fitness-to-norm
- Many ways for complying to law
- *IF* a system complies... *HOW* a system complies

PREFERRED COMPLIANCE PROBLEM:

Problem of finding the *best* compliance solution,
given a law and a set of stakeholder preferences



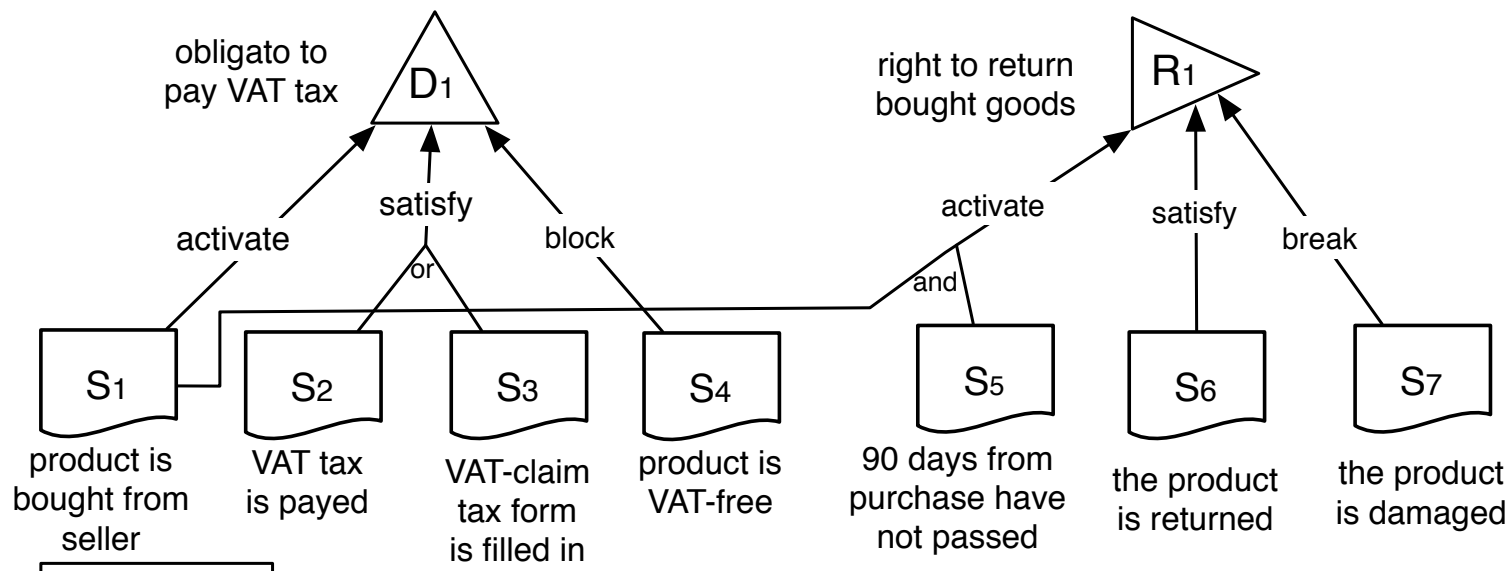
EXAMPLE



- Customer/Seller example: many solutions
- Exploring compliance solutions: too many models (3^s)
depending on the topology of the model



STAKEHOLDER PREFERENCES



- $\text{pref}_1 = \{S_3 >_{\text{cost}} S_2\}$
but maybe... $\text{pref}_2 = \{S_2 >_{\text{time}} S_3\}$



Preferred Compliance Problem (PCP):

Identify alternative ways to comply with applicable
 $N_i \leftarrow$ Norms, and comparing these alternatives on the basis
of stakeholder preferences.

X_i is a set of Situations

$<_c$: relation defining partial order on Situations

Candidate Compliance Solution:

a pair (X_i, N_i) , where X_i satisfies all norms in N_i


Solution to PCP:

find a CCS that ranks better according to the relation $<_c$



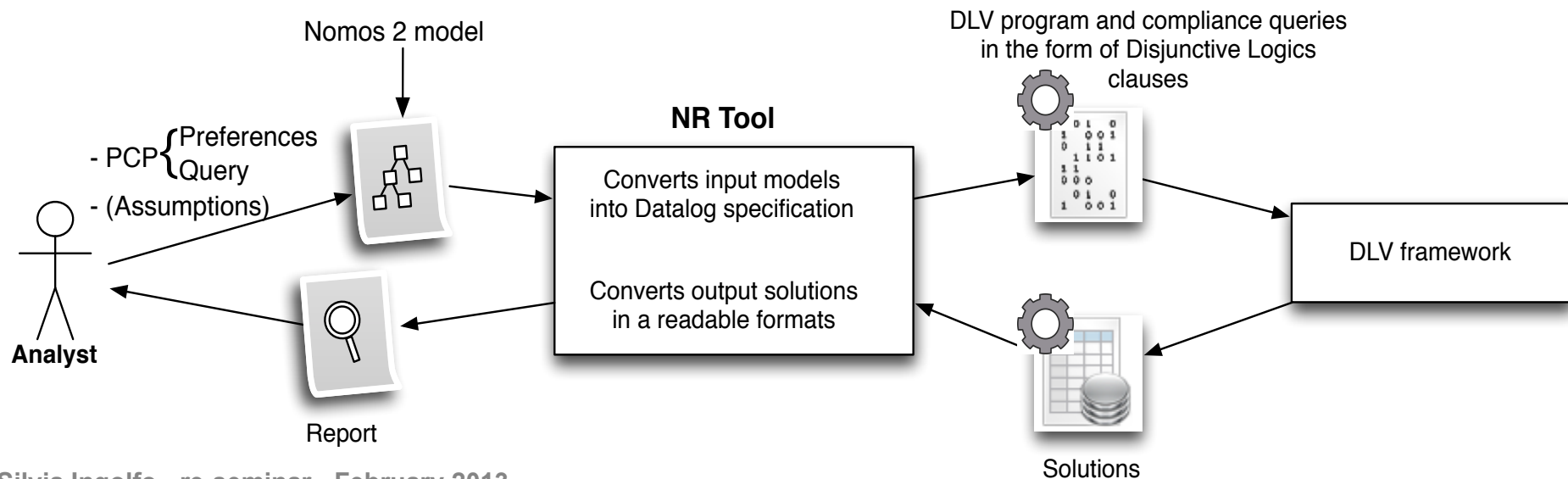
Solution to PCP:

find a CCS that ranks better according to the relation \leq_c

 Find all \rightarrow rank?

Assumptions: value of some situations that are known or hypothesized to be true or false

Generate and prune solutions \rightarrow rank





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POSITION PAPER FOR SEAMS

- work with Vitor (*remember this guy from Brazil?*)
- **IDEA:** law has a great impact in the design → need flexible approaches to adapt → exploit existing work on requirement adaptation to adapt to law
- We characterize the relationship between law and adaptation: *Zanshin* + Google Driverless Car



POSITION PAPER FOR SEAMS

- **Driverless Car** is “an autonomous vehicle capable of fulfilling the human transportation capabilities of a traditional car. As an autonomous vehicle, it is capable of sensing its environment and navigating on its own. A human may choose a destination, but is not required to perform any mechanical operation of the vehicle”
- Many car companies working → Google wins!
 - Nevada passed a law in 2011
 - California 201X: soon
- Challenge
 - Drive across multiple state (driving age? driving speed?...)
 - Obey traffic law

- **VEHICLE OPERATOR:** component of the car that takes care of the operation of the vehicle (manage user requests, manage mechanics, obey traffic law, ...)

- [illegible]

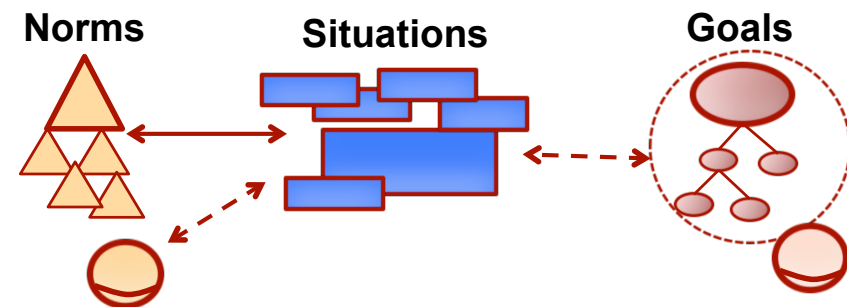
(current) Future work

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CURRENT - FUTURE WORK

- Scalability of the tool
- Legal roles vs functional roles



FUTURE - FUTURE WORK

- Link model with goals

Questions

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