

Towards a Framework for Law-Compliant Software Requirements

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What are requirements?



▶ $D, S \models R$

- Pamela Zave, Michael Jackson: Four Dark Corners of Requirements Engineering. ACM Trans. Softw. Eng. Methodol. 6(1): 1-30 (1997)

▶ Domain Properties

- ↪ things in the **application domain** that are true whether or not we ever build the proposed system

▶ Requirements (represented as goals)

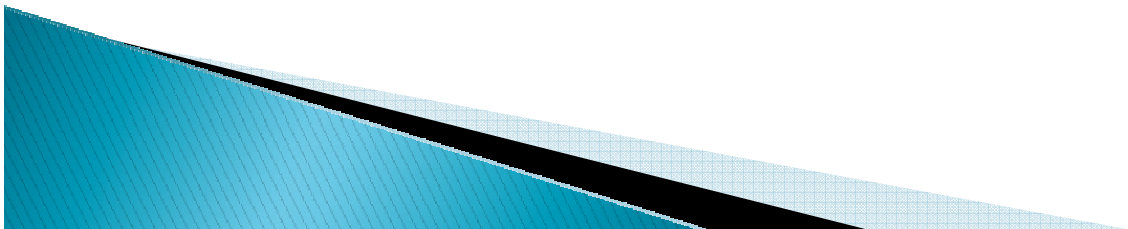
- ↪ things in the **application domain** that we wish to be made true by delivering the proposed system

▶ Specification (set of functions/tasks)

- ↪ Is a description of the behaviours **the program** must have in order to meet the **requirements**

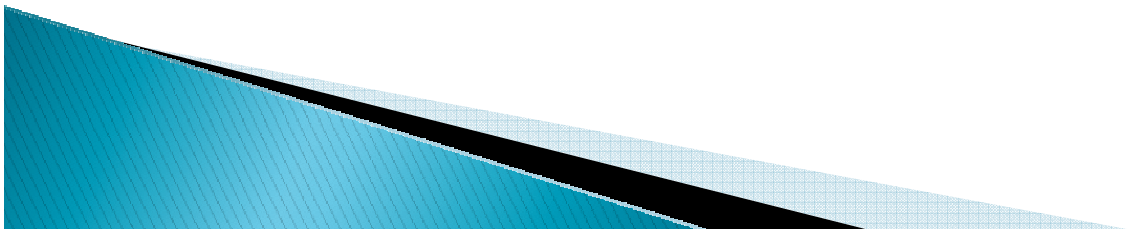
Motivation

- ▶ New laws, increased pervasiveness of IS
- ▶ Laws are increasingly source of requirements
- ▶ However law prescriptions are NOT stakeholders goals
 - Stakeholders **want** goals, whereas law prescriptions are **imposed to** stakeholders
 - Law prescriptions can contradict goals



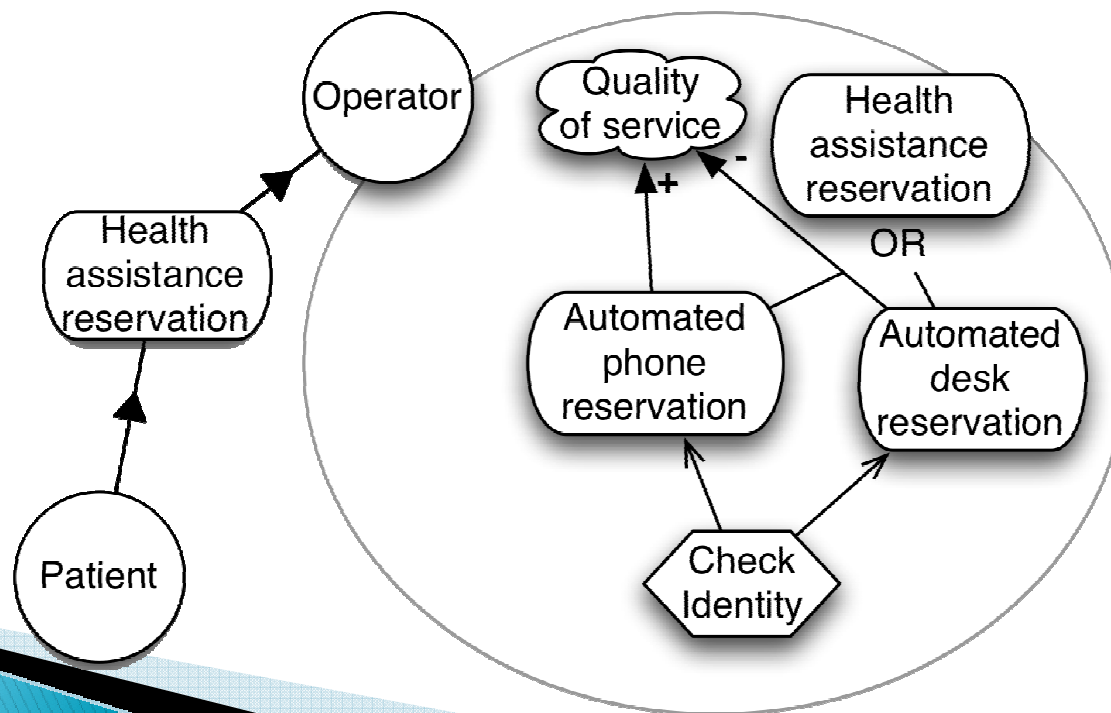
Problem statement

- ▶ $D, R \models L$
- ▶ **Intentional compliance:**
 - Laws give certain prescriptions, and stakeholders have the intention to satisfy the prescribed goal
 - Distribution of responsibilities, such that, if every actor fulfils its goals, then the compliance is ensured
 - Compliance is ensured by construction
- ▶ Needed: languages for modeling
 - Goals (i^*)
 - Laws (Nomos)



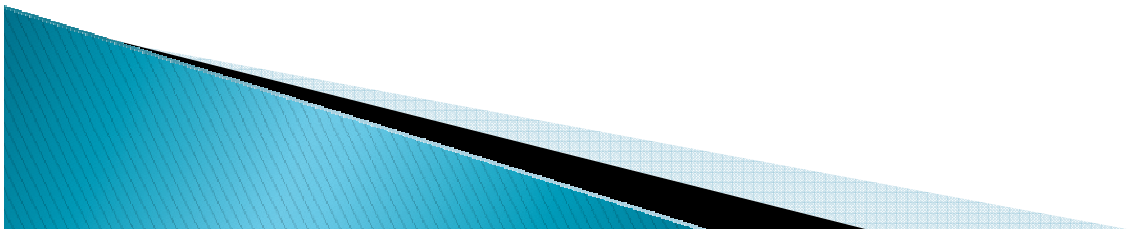
Language for goals

- ▶ Domain: stakeholders, their goals and their organizational settings
 - Actor have goals and interact with each other to achieve them
- ▶ i^* (but any other GORE framework is suitable)



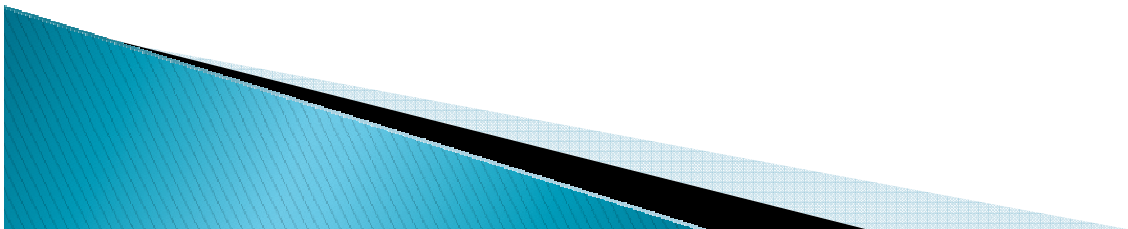
The Nomos framework

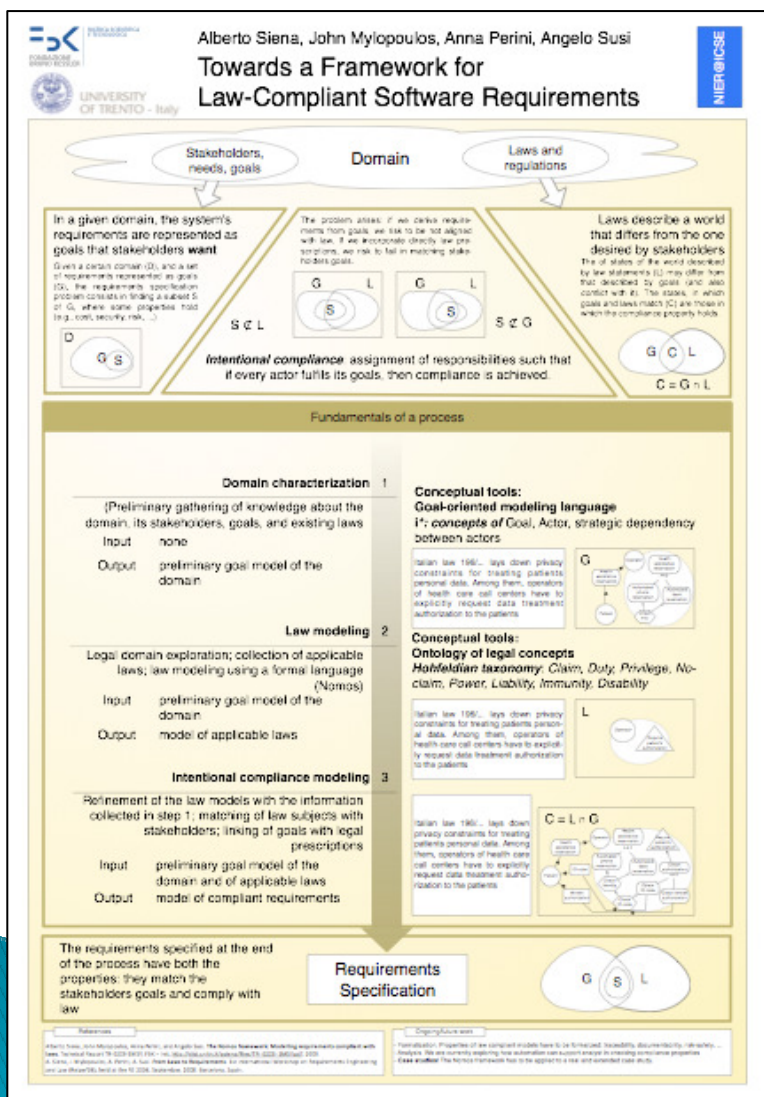
- ▶ Nomos = A language + a method + a set of properties (e.g., intentional compliance)
- ▶ It allows to
 - **Reason** about how requirements are generated (select among alternatives)
 - **Check** properties of requirements models wrt. Laws
- ▶ Framework for systematically going from law prescriptions to requirements.
 - Nomos: $L \times R \rightarrow R'$



A process for law compliance

- ▶ Step 1 – Domain characterization
 - (Preliminary gathering of knowledge about the domain, its stakeholders, goals, and existing laws)
- ▶ Step 2 – Law modeling
 - Legal domain exploration; collection of applicable laws; law modeling using a formal language (Nomos)
- ▶ Step 3 – Goal modeling
 - Refinement of the law models with the information collected in step 1; matching of law subjects with stakeholders; linking of goals with legal prescriptions





- ▶ A case study: application on Italian data protection law
- ▶ Current state of the work: the language, the process, the compliance properties



Thank you

