Towards a Framework for Law-Compliant Software Requirements

In a given domain, the system's requirements are represented as goals that stakeholders want.

Given a certain domain (D), and a set of requirements represented as goals (G), the requirements specification problem consists in finding a subset S of G, where some properties hold (e.g., cost, security, risk, ...)

The problem arises: if we derive requirements from goals, we risk to be not aligned with law. If we incorporate directly law prescriptions, we risk to fail in matching stakeholders goals.

Laws describe a world that differs from the one desired by stakeholders.

The set of states of the world described by law statements (L) may differ from that described by goals (and also conflict with it). The states, in which goals and laws match (C) are those in which the compliance properly holds.

Domains, needs, goals

S \subset L

G

D, R \models L

C = G \cap L

Intentional compliance: assignment of responsibilities such that if every actor fulfills its, then compliance is achieved.

Fundamentals of a process

1. Domain characterization
   (Preliminary gathering of knowledge about the domain, its stakeholders, goals, and existing laws)
   Input: none
   Output: preliminary goal model of the domain

2. Law modeling
   Legal domain exploration; collection of applicable laws; law modeling using a formal language (Nomos)
   Input: preliminary goal model of the domain
   Output: model of applicable laws

3. Intentional compliance 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
   Input: preliminary goal model of the domain and of applicable laws
   Output: model of compliant requirements

Requirements Specification

Properties of the Nomos models:
- Traceability
- Documentability
- Risk
- Safety
- Security

Conceptual tools:
- Goal-oriented modeling language
  \( \ast \): concepts of Goal, Actor, strategic dependency between actors

Conceptual tools:
- Ontology of legal concepts
  Hohfeldian taxonomy: Claim, Duty, Privilege, Non-claim, Power, Liability, Disability

Conceptual tools:
- Laws and goals
  As a result of the legal prescription, the identity of the patient is checked in an anonymous way; an id code is requested to the patient, without actual data exchange with the call center operator.

Reference:

Ongoing future work:
- Formalization. Properties of law compliant models have to be formalized: traceability, documentability, risk, safety, ...
- Analysis. We are currently exploring how automation can support analyst in checking compliance properties.
- Case studies. The Nomos framework has to be applied to a real and extended case study.