Directed Qualified Pattern, Influence, Non-Influence Relations, Optional Attributes

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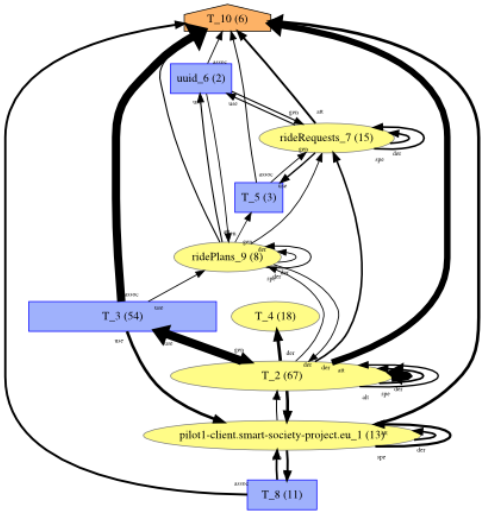
Size of edges is encoded as attribute



Type or Relation Name	Representation in the PROV-N notation	C
Entity	entity(id, [attr1=val1, ...])	
Activity	activity(id, st, et, [attr1=val1, ...])	
Generation	wasGeneratedBy(id;e,a,t,attrs)	
Usage	used(id;a,e,t,attrs)	
Communication	wasInformedBy(id;a2,a1,attrs)	C
Start	wasStartedBy(id;a2,e,a1,t,attrs)	
End	wasEndedBy(id;a2,e,a1,t,attrs)	
Invalidation	wasInvalidatedBy(id;e,a,t,attrs)	
Derivation	wasDerivedFrom(id; e2, e1, a, g2, u1, attrs)	C
Agent	agent(id, [attr1=val1, ...])	
Attribution	wasAttributedTo(id;e,ag,attr)	
Association	wasAssociatedWith(id;a,ag,pl,attrs)	C
Delegation	actedOnBehalfOf(id;ag2,ag1,a,attrs)	
Influence	wasInfluencedBy(id;e2,e1,attrs)	
Alternate	alternateOf(alt1, alt2)	C
Specialization	specializationOf(infra, supra)	
Membership	hadMember(c,e)	C

In PROV-DM, most terms are equipped with optional attribute-value pairs "representing additional information".

In PROV-O, most properties are accompanied by the "directed qualified pattern"

Except SpecializationOf, AlternateOf, and HadMember

Solution

- Define the directed qualified pattern in a standalone fashion, independently of the notion of influence in PROV
- Make Influence follow the Directed Qualified Pattern.
- Make SpecializationOf, AlternateOf, HadMember extensible. This means,
  - optional identifiers and attributes in PROV-DM,
  - follow the Directed Qualified Pattern in PROV-O.
- SpecializationOf, AlternateOf, HadMember are not an influence.