

Modelling Service Dynamics A Case Study

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Ferrario and Guarino: *Towards an ontological foundation of service science.*

First Future Internet Symposium 2009

Ferrario, Guarino, Janiesch, Kiemes, Oberle, Probst: *Towards an ontological foundation of service science: the General Service Model.*

Wirtschaftsinformatik 2012

Ferrario and Guarino: *Commitment-based modelling of service systems.* Int. Conf. on Exploring Service Science 2012

Nardi, Falbo, Almeida, Guizzardi, Pires, van Sinderen, Guarino: *Towards a commitment-based reference ontology for services.* IEEE EDOC 2013

Nardi, Falbo, Almeida, Guizzardi, Pires, van Sinderen, Guarino, Fonseca: *A commitment-based reference ontology for services.* Information Systems, 2015 (in press).

Guarino, Guizzardi, Bochicchio, Longo, Zappatore: *Modeling Service Dynamics: A Case Study.* VMBO 2015.

2009-2012: early work

- Attempt for a single unifying definition: Service as a complex occurrence (commitment + process)

2013-2014: interaction with Guizzardi's NEMO group

- 'Service' is systematically polysemic
- Service as commitment is the core meaning
- Commitment is not an occurrent (a state), but first of all an object, which can be subject of genuine change

2015: interaction with University of Salento (Bochicchio's group):

- The service procurement perspective adds further challenges to our model:
 - the new roles of service owner and service manager arise
 - the dynamics of contract negotiation and service level monitoring need to be taken into account

- **Action-based**: *passing the salt* is a service (application of competences - microscopic perspective)
- **Commitment-based**: a previous commitment is needed (economic activity - mesoscopic perspective)

The **mesoscopic perspective** is the one that accounts for the ordinary, business-level notion of service.

Commitment is the glue that takes a **service system** together

How can you tell that a service is **present**, here and now?

- ...if somebody is **committed** to do something here and now
- (a service can be present without being *active*...)

service commitment

a **provider** guarantees the execution of some **type of actions**
executed by a **producer**

on the occurrence of a certain **triggering event**,

in the interest of a **customer**

upon prior agreement with the customer

according to a certain specification (**service description**)

which constraints the way service actions will be performed (**service process**)

a commitment **state** starts with a commitment **act**

Service Commitment: explicit and enduring commitment to *guarantee* the execution of some type of *core actions*, on the occurrence of a certain *triggering event*, in the *interest* of another agent and upon *prior agreement* according to a *service description* which constrains the way service actions will be performed.

Service Process: actual *implementation* of a service commitment, consisting of a number of interdependent actions including those necessary to monitor the *triggering events*, the *core actions* mentioned in the commitment, and any further actions aimed at supporting or complementing the successful execution of such core actions.

Service is a complex temporal entity (a complex occurrence) consisting of a service *commitment* and the corresponding *process*.

Towards *potential customers*

Directed to a *service description*, that is intended to facilitate service *discovery*

It is a state resulting from an act that is in a sense *uni-directional*, as it does not imply an explicit agreement

It is *not* strictly speaking *binding* for the provider. Until there is at least one specific, actual customer, the provider cannot be directly sanctioned for not having respected his or her commitment

So not honoring a generic commitment can obviously result in a loss of credibility or reputation, but not in a direct sanction

Specific commitment is a state that follows a **mutual agreement** between provider and customer, most of the times consisting in the signature of a **contract**.

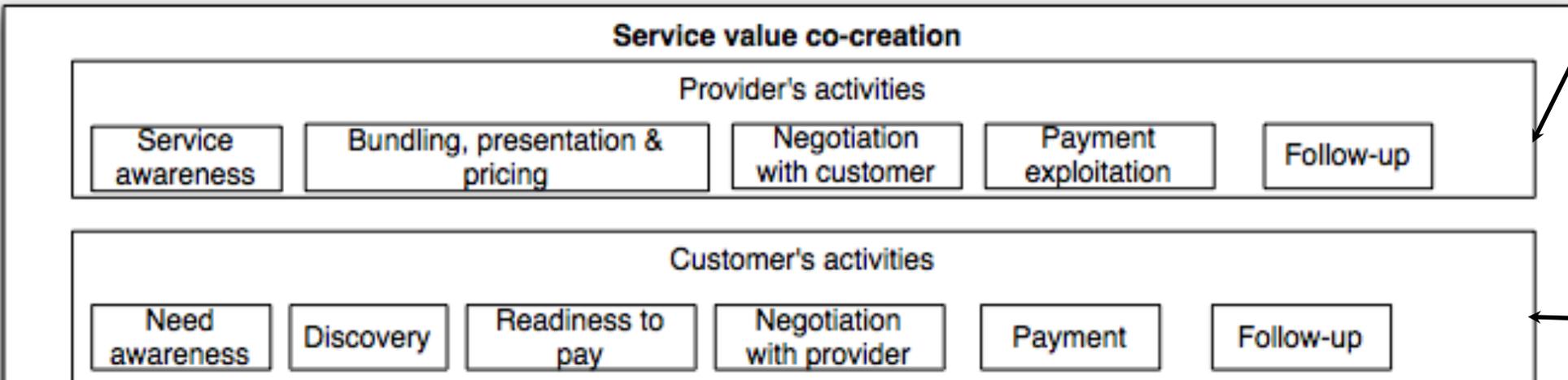
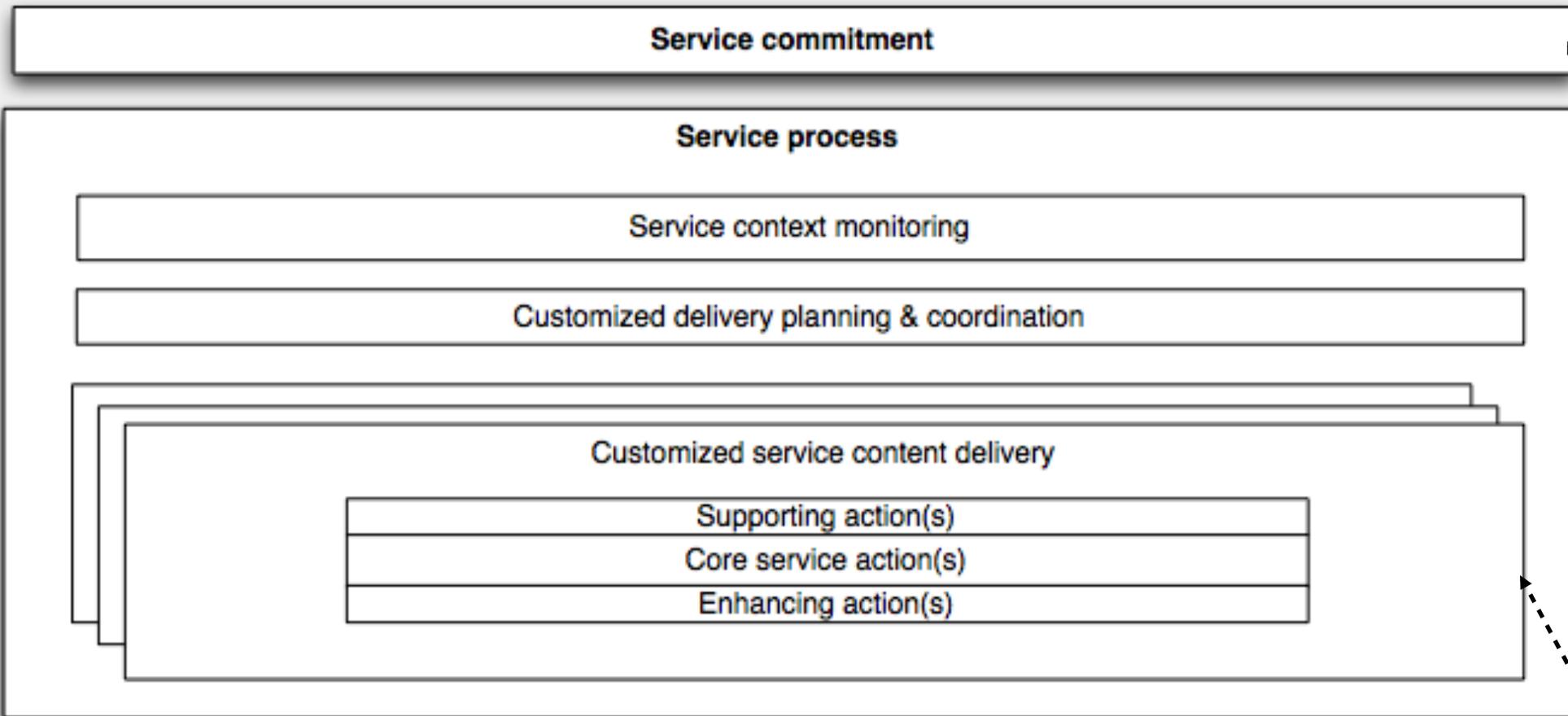
The contract describes how the service will be implemented for the individual customer, so normally it specifies the service description in more detail.

Two relevant differences with the generic commitment:

- the contract commits **both parties**, not only the provider
- It has a greater **binding power**, whose **violation** usually entails a **sanction**, that may be described in the contract itself.

↓ Occurrences ↓

↓ Acto



Pro

Cust

Services are *not* kinds of goods (*immaterial goods*), since there is a radical difference between goods and services [Hill 77]:

- Goods are *transactable* and *transferable*
- Services are transactable, but they are *not transferable*

Why are they not transferable?

Our previous answer:

*because services have a temporal nature, they are **OCCURRENCES!***

Our present answer:

*because services presuppose commitments, and commitments are not transferable, since they **inhere to agents.***

...and its limits

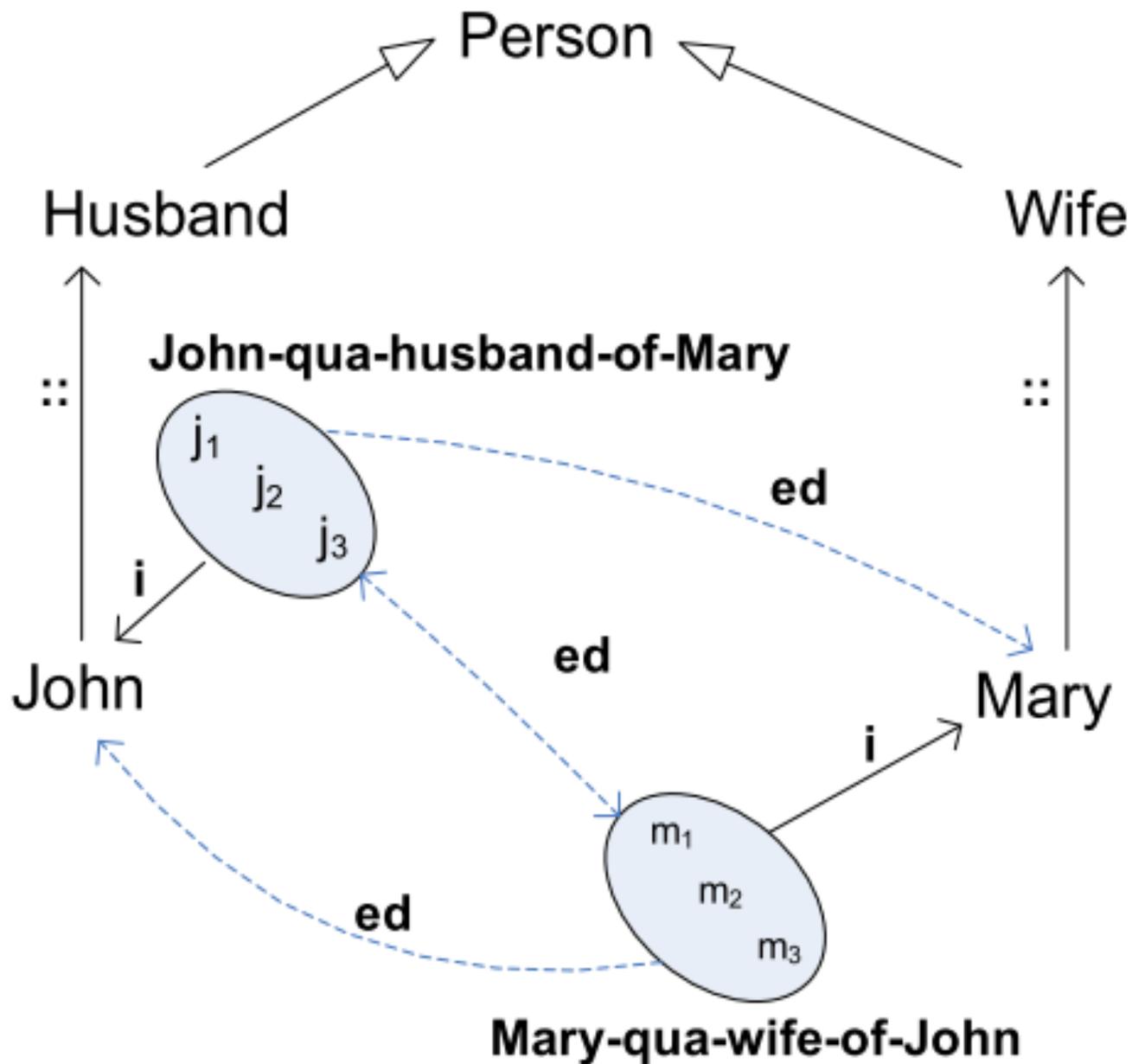
It is the *glue* that keeps the whole service system together and it help defining its boundaries

It gives the *continuity* necessary to make a series of actions a service

...but alone it can't account for the *dynamics* of a service

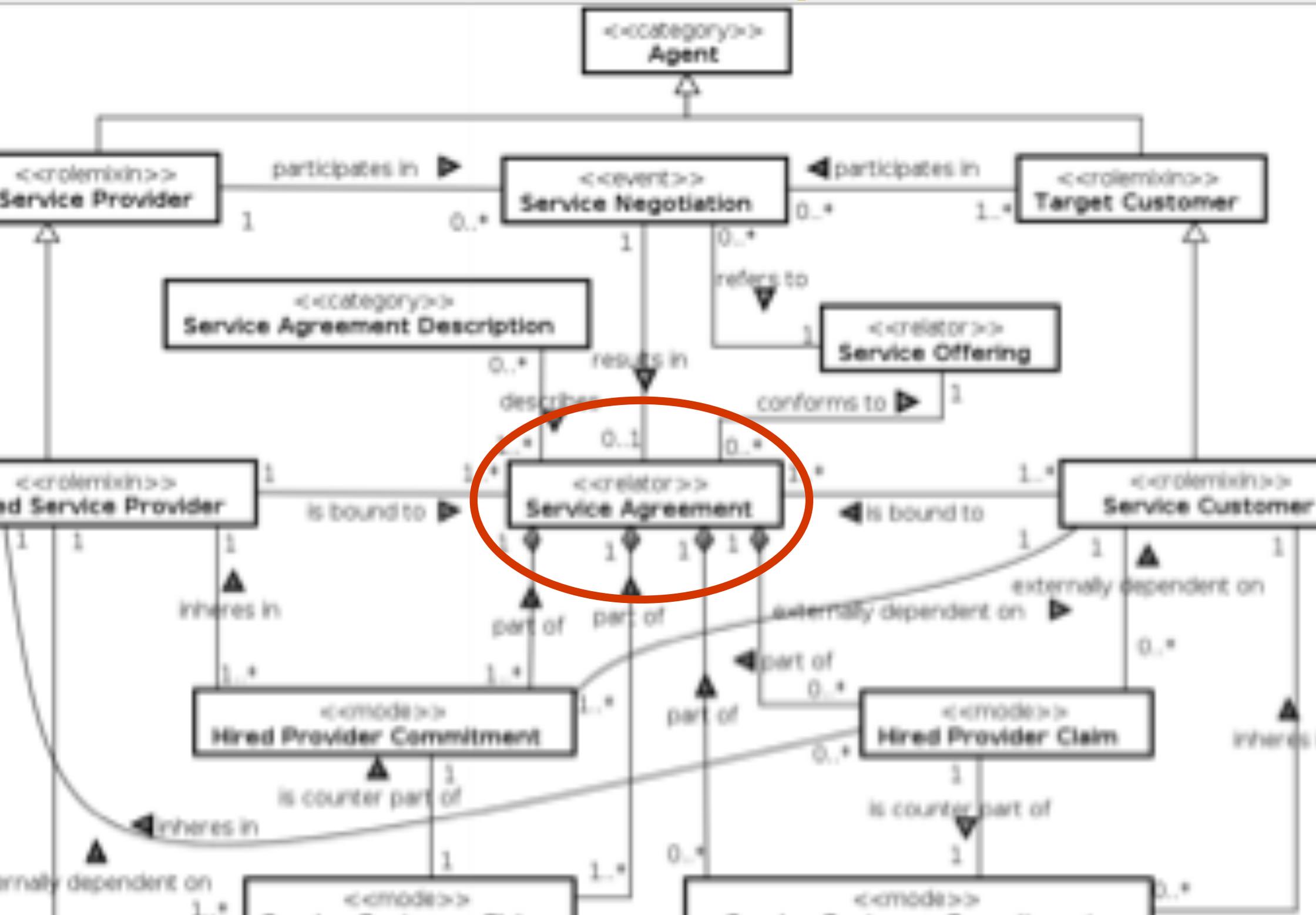
we need to be able to point at what is *behind* a *service relationship*

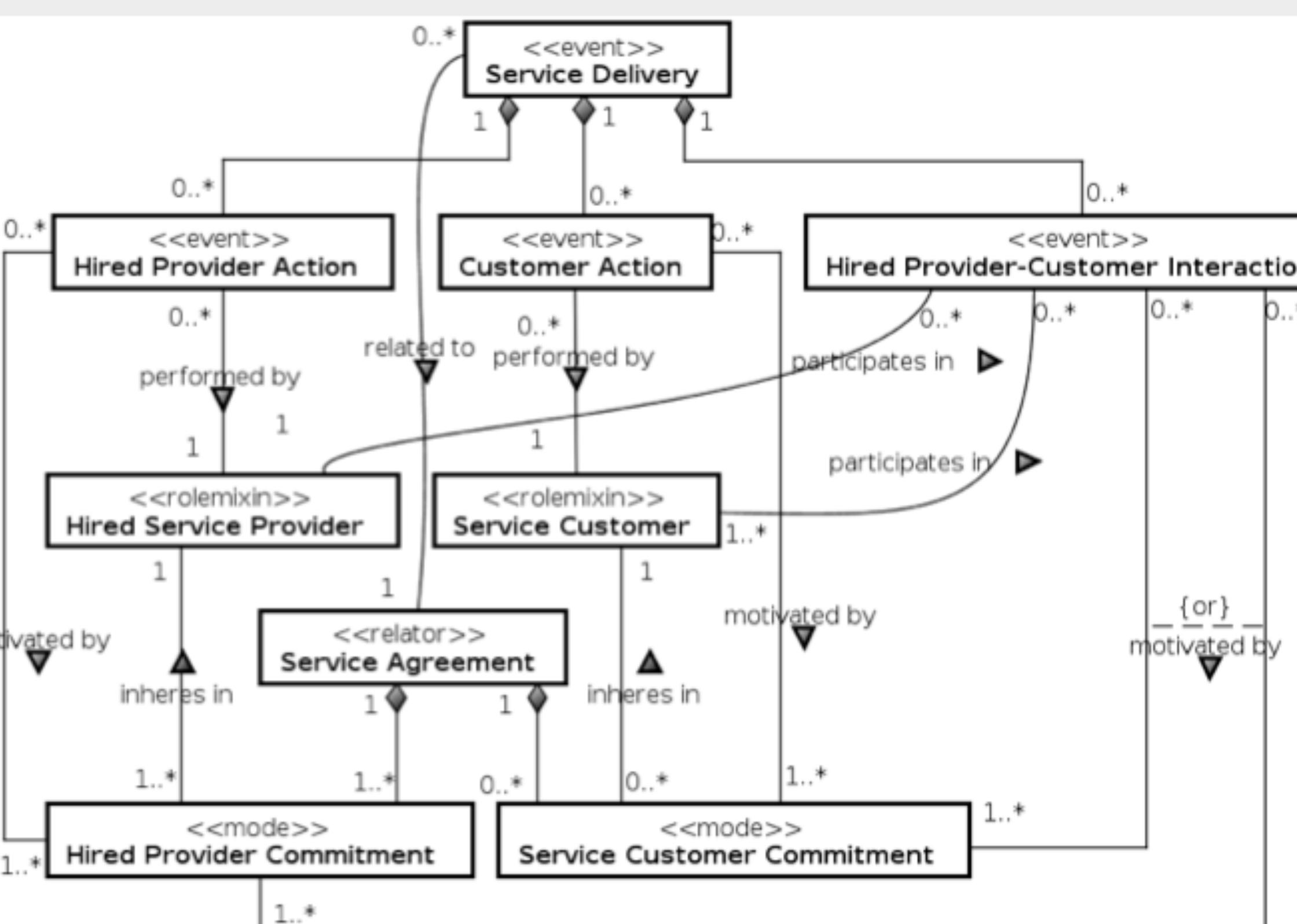
(Semina) a Relationship





Relationship





“The Bank is around the corner and gives good advice on sub-prime loans” (*Physical Object x Organizational Agent*)

“The Book is heavy to carry but is easy to understand” (*Physical Object x Abstract Information Content*)

“These ducks laying eggs in my backyard are common around Europe” (*Physical Object x Kind*)

“Dr.Smith’s Dental Service is fast but expensive” (*Service Delivery x Service Offering*)

Service Provider is the person or authority who commits to have the service executed

Service Producer is the person or organization that actually performs the actions constituting the delivery of the service. Provider and producer may coincide, but this is not always the case.

Service Customer is the one that requests the service and then negotiates for its customized delivery

Service Consumer is the direct beneficiary of the service
Customer and consumer may coincide, but this is not necessarily so

Consumer and producer may also coincide, in very particular situations

Problem: what's the action promised by rental services? Who executes it?

Service provider: who *commits*, *guaranteeing* that the action is performed

Service producer: who *executes* the action

Three cases:

- Service **action** producer = service provider
- Service **action** producer delegated by provider
- Service **action** producer = service consumer

• Service consumer = service costumer

• Service consumer \neq service costumer

• Service consumer = core action patient

• Service consumer = core action beneficiary

Mapping thematic roles to service roles

• Commitment agent

• Commitment beneficiary

• Core action agent

• Core action beneficiary

• Core action patient

• Core action instrument

- Service provider
- Service customer
- Service producer
- Service consumer
- Service object

