

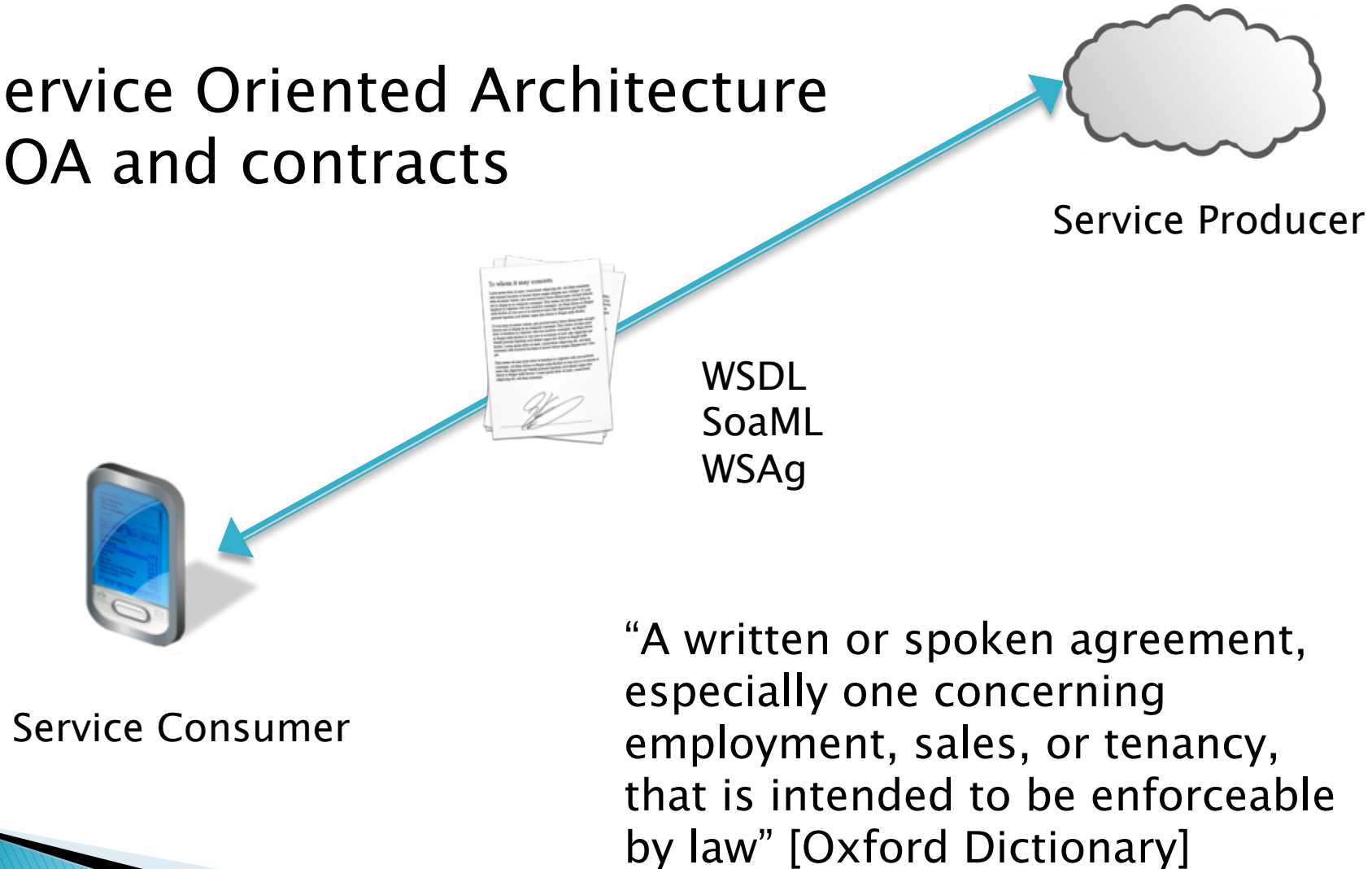
A Commitment Based Approach for Service Agreement Specification: Modeling Language and Methodology

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Concept of contract

- Service Oriented Architecture
- SOA and contracts



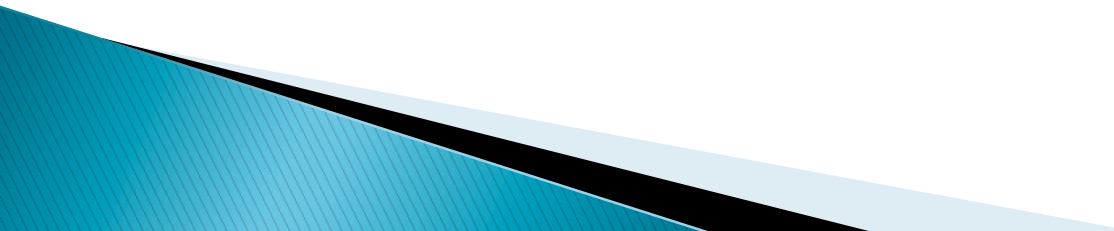
Modeling SOA

- ▶ Currently modeling languages do not allow for modeling and analyzing contracts
- ▶ Agent Oriented vs Object Oriented Modeling language

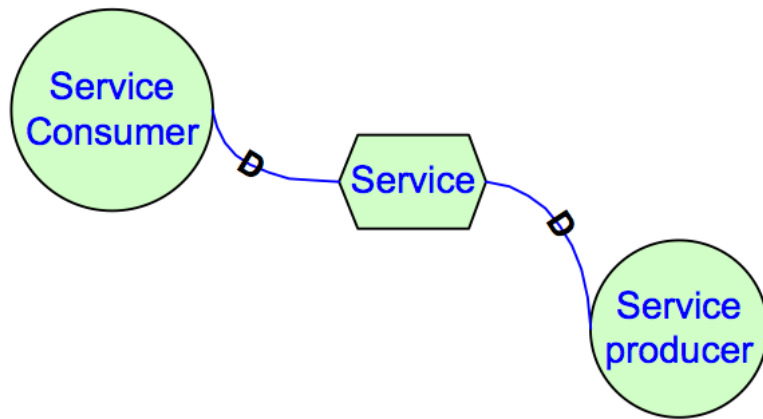


- Agent
- Goal
- Social modeling

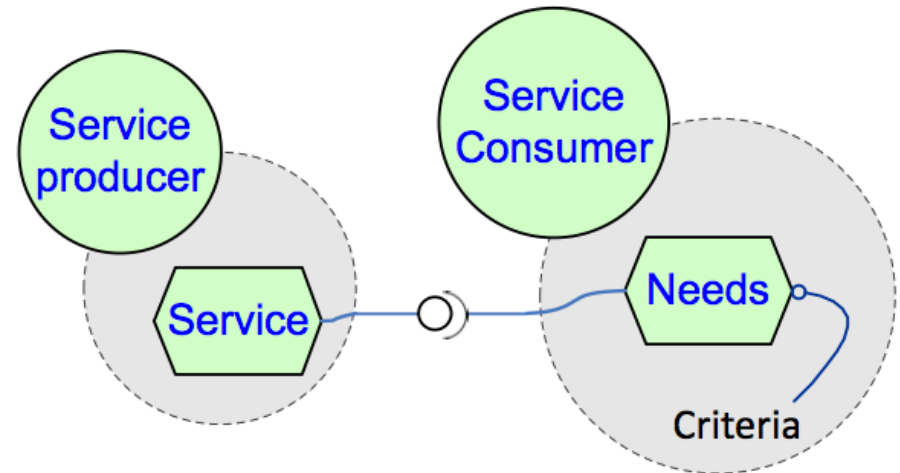
Objectives of the work

- ▶ Develop an agent-based language able to models contracts
 - Extension of the Tropos modeling language
 - Define a specific analysis process
 - ▶ Develop a method to derive WSAg contracts from goal models
 - ▶ Validate extended modeling language with case studies
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Extension of the modeling language



- It does not model contracts
- Too general
- Incomplete information



- Focused on contracts
- It models reciprocal dependency
- Specific modeling of contract contents

The commitment abstraction

*The expression C (debtor, creditor, antecedent, consequent) means that the debtor commits to the creditor in the context that if the antecedent becomes true, the debtor would bring about the consequent.
[Singh, M.P. et al., Commitment-Based Service-Oriented Architecture]*

C (debtor, creditor, antecedent, consequent)

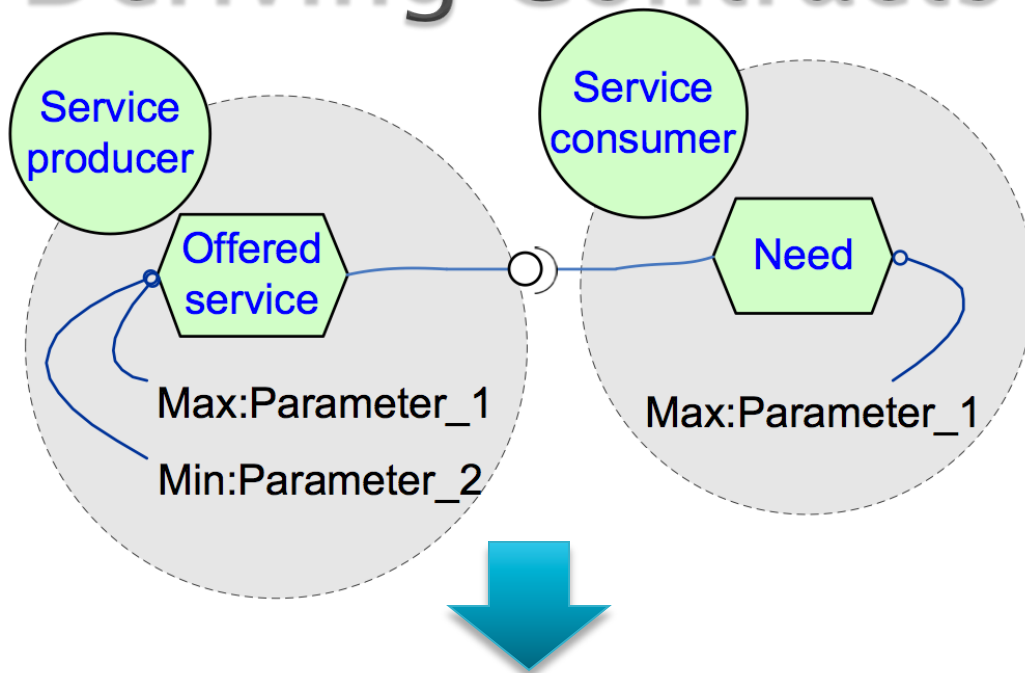


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- ▶ Every service link is mapped to two commitments
- ▶ Every commitments pair represents an agreement, i.e. a contract

Deriving Contracts



$C(\text{Cons}, \text{Prod}, \text{Need}[\text{Max:Parameter}_1], \text{Payment})$

$C(\text{Prod}, \text{Cons}, \text{Payment}, \text{OfferedService}[\text{Max:Parameter}_1, \text{Min:Parameter}_2])$

Goal model

Commitments

Contracts

From commitments to contracts

- ▶ It's not possible to insert all low level details in Tropos modeling language
- ▶ Contract proposal
 - Intermediate step
 - Compliant with WSAg
 - Contains information on service composition and parameter to minimize or maximize



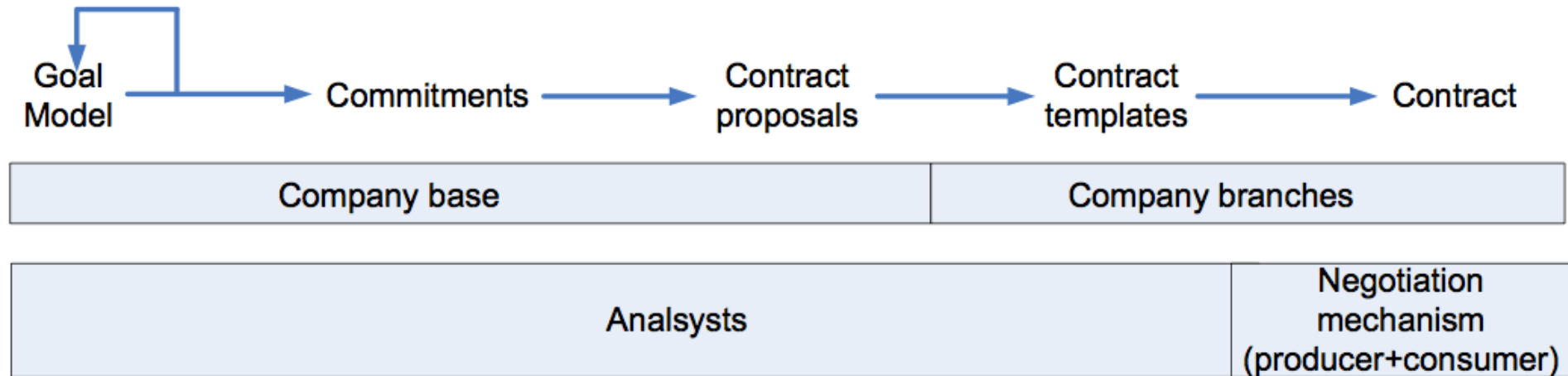
From commitment to contracts

$C(\text{Cons}, \text{Prod}, \text{Need}[\text{Max:Parameter_1}], \text{Payment})$

$C(\text{Prod}, \text{Cons}, \text{Payment}, \text{OfferedService}[\text{Max:Parameter_1}, \text{Min:Parameter_2}])$

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Methodological guidance



Validation

- ▶ Case study 1: Telecommunication company
 - Actors
 - Service producer: Telecommunication company
 - Service consumer: Tourist role
 - Objectives
 - Validating service composition and contracts derivation
- ▶ Case study 2: Dropbox
 - Actors
 - Service producer: Dropbox company
 - Service consumer: Businessman role
 - Objectives
 - Validating support of new services

Summary

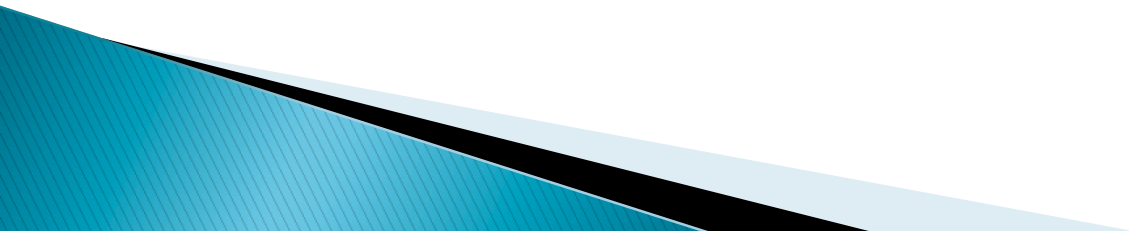
- ▶ New ideas
 - Concept of contract in Agent-Oriented modeling language
 - Use of commitments as contract abstraction
- ▶ Benefits
 - Specific approach for modeling and analysing contracts
 - Automated contract generation
- ▶ Disadvantages
 - Dimension of the diagram

Future work

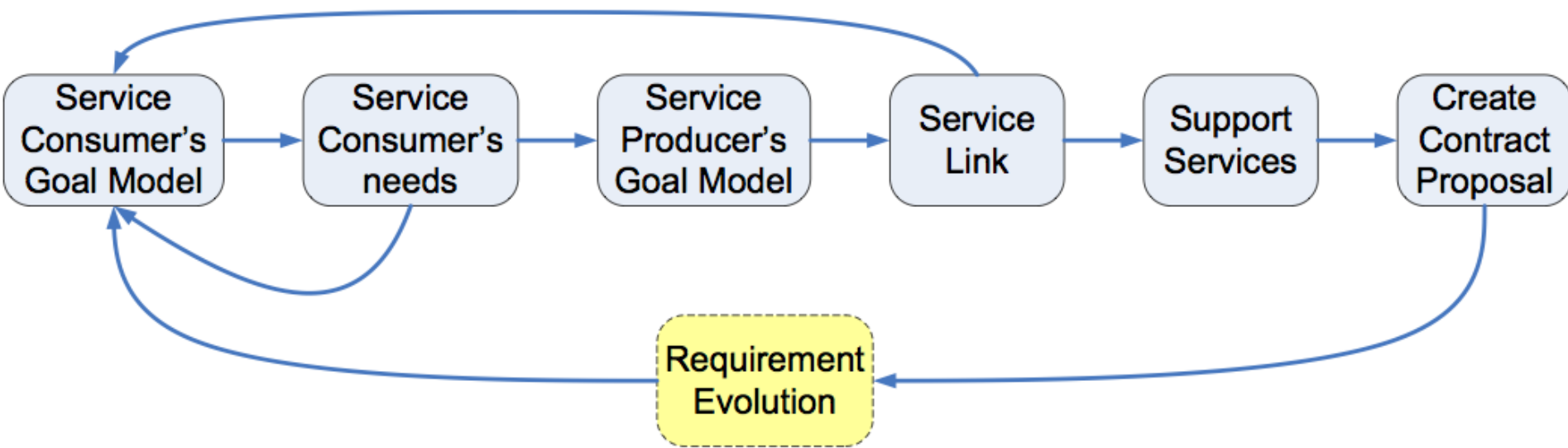
- ▶ Implementation of the tool
 - Extension of openOME
- ▶ Specify the how service producer branches will create contracts
 - Cost functions: from contract proposal to contract template
 - Framework WSAg already implemented



Questions?



Modeling process



From commitment to contracts

C(Cons, Prod, Need[max:Par1],Payment)

C(Prod, Cons, Payment, OfferedService[max:Par1,min:Par2])

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