



**Hasso
Plattner
Institut**

IT Systems Engineering | Universität Potsdam

Enabling Business Experts to Discover Web Services for Business Process Automation

Emerging Web Service Technologies

Agenda

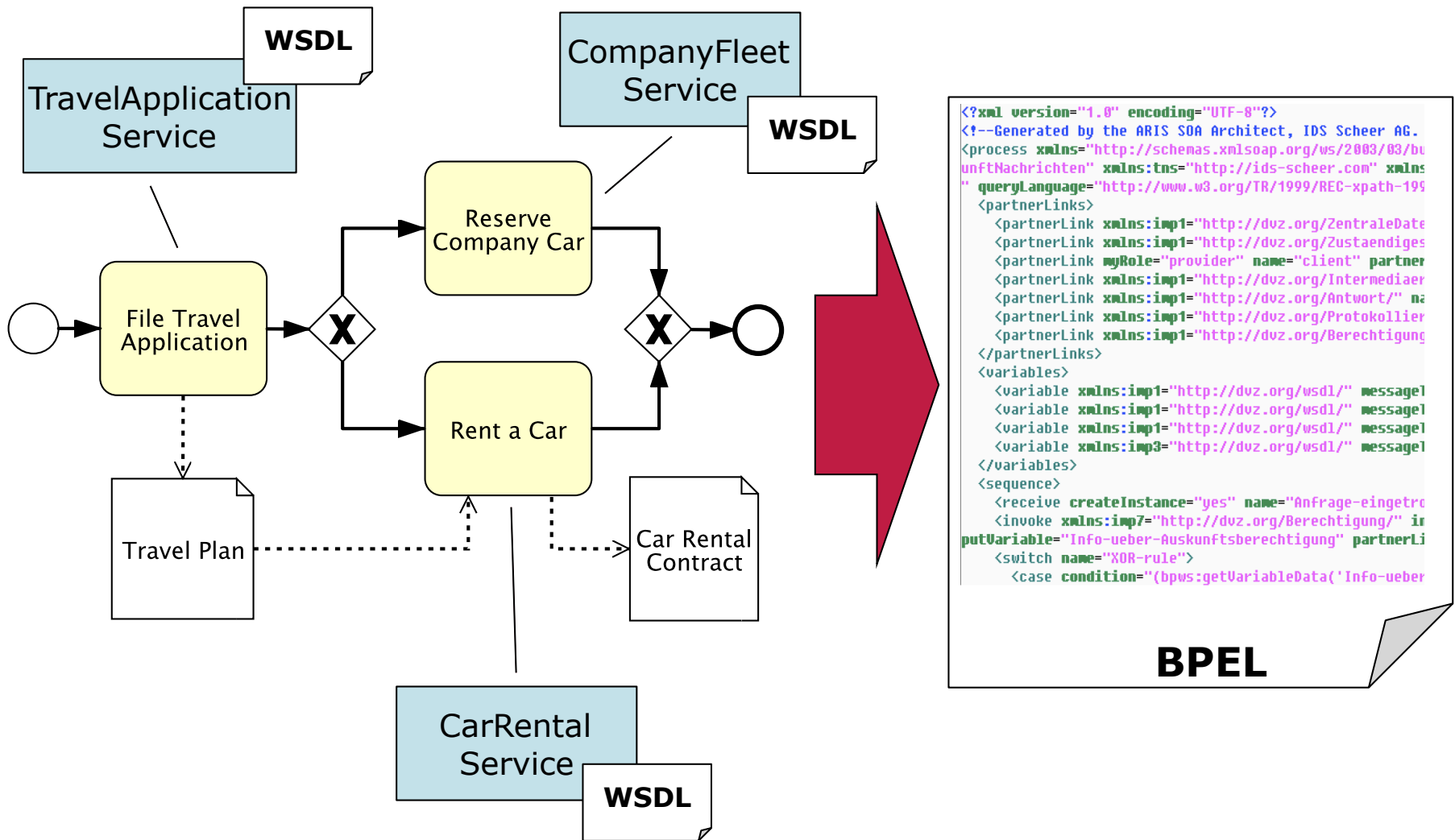
2

- Problem & Background
- Approach
- Evaluation
- Future Work
- Summary

- **Problem & Background**
 - Business Process Automation
 - The Gap Between Business & IT
 - Theoretical Foundations of Service Discovery
- Approach
- Evaluation
- Future Work
- Summary

Business Process Automation

4

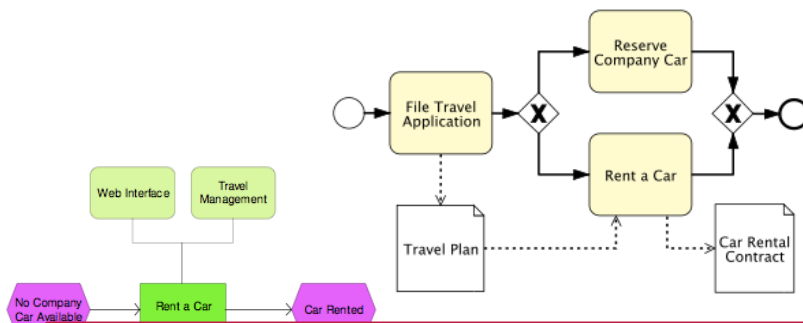


The Gap Between Business & IT

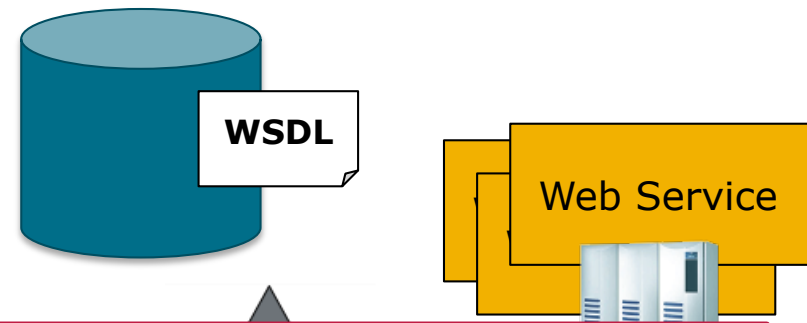
5



Business Experts



IT Experts



How can a business expert discover web services while designing a business process?



Approaches for Service Discovery

6

1. Structural

- Use syntactical information (e.g. operations, messages)
- Very technical

2. Lexical

- Use natural language descriptions (e.g. operation names, documentation descriptions)
- NLP, lexical databases

3. Semantic

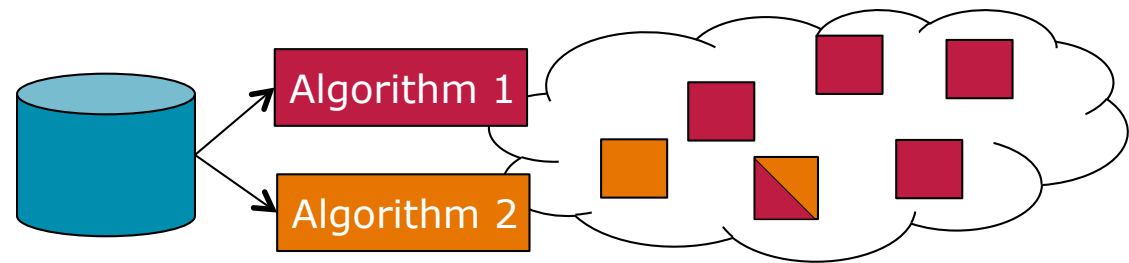
- Use ontologies to describe capabilities and properties
- Semantic Web Services

Combining Approaches

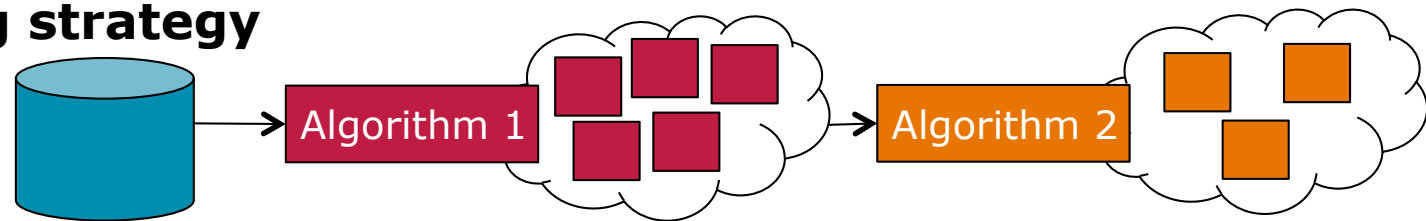
7

Most discovery algorithms combine different approaches to achieve a better result.

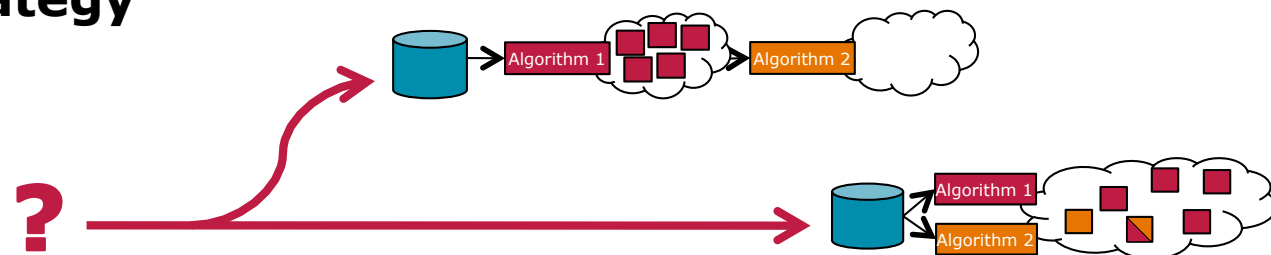
1. Mixed strategy



2. Cascading strategy

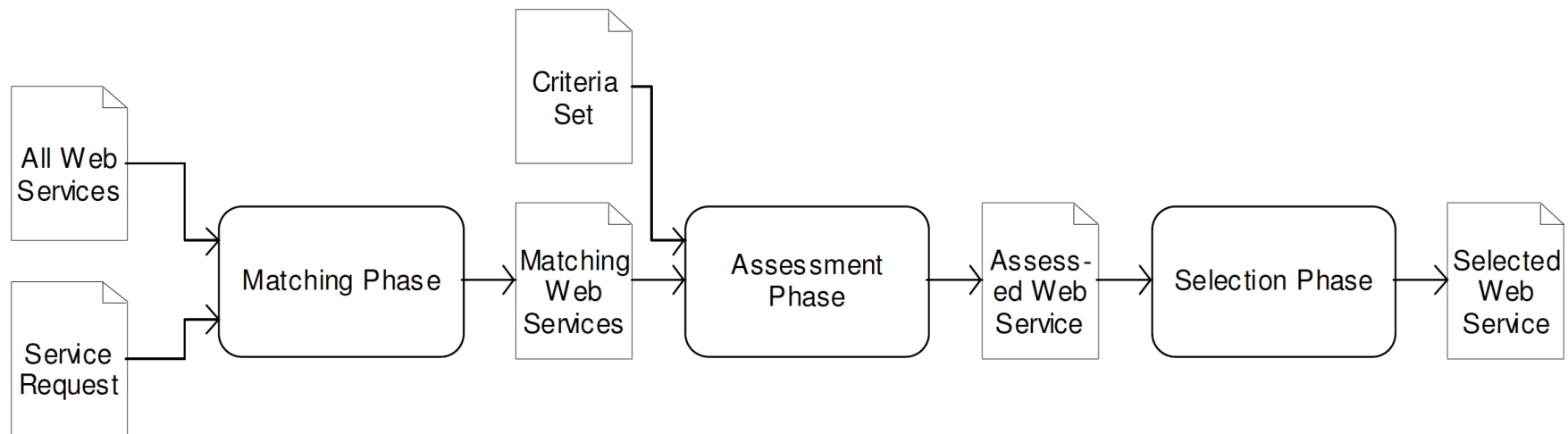


3. Switching strategy



Major Phases of Web Service Discovery

8



[Kokash et al.]

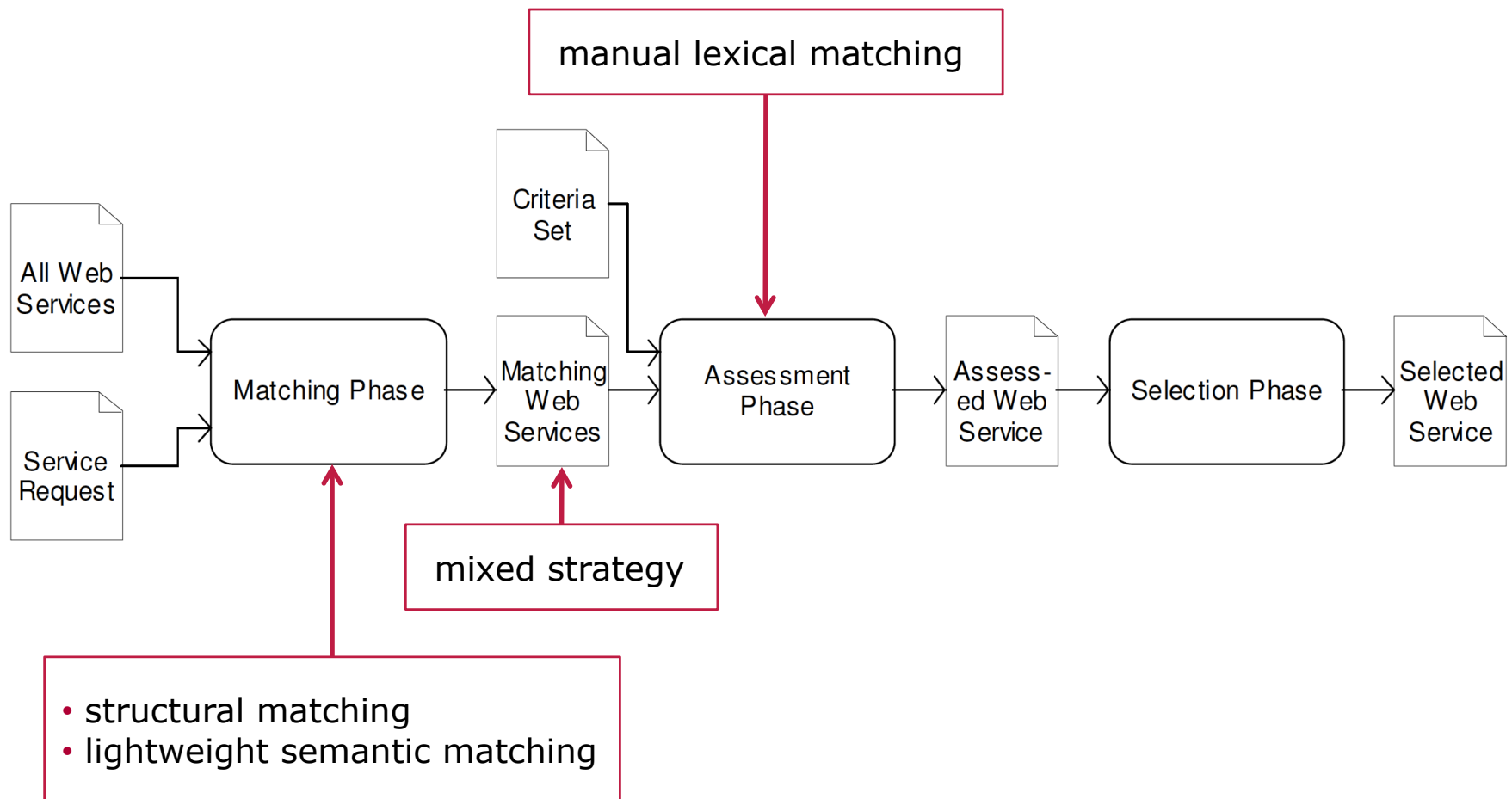
Agenda

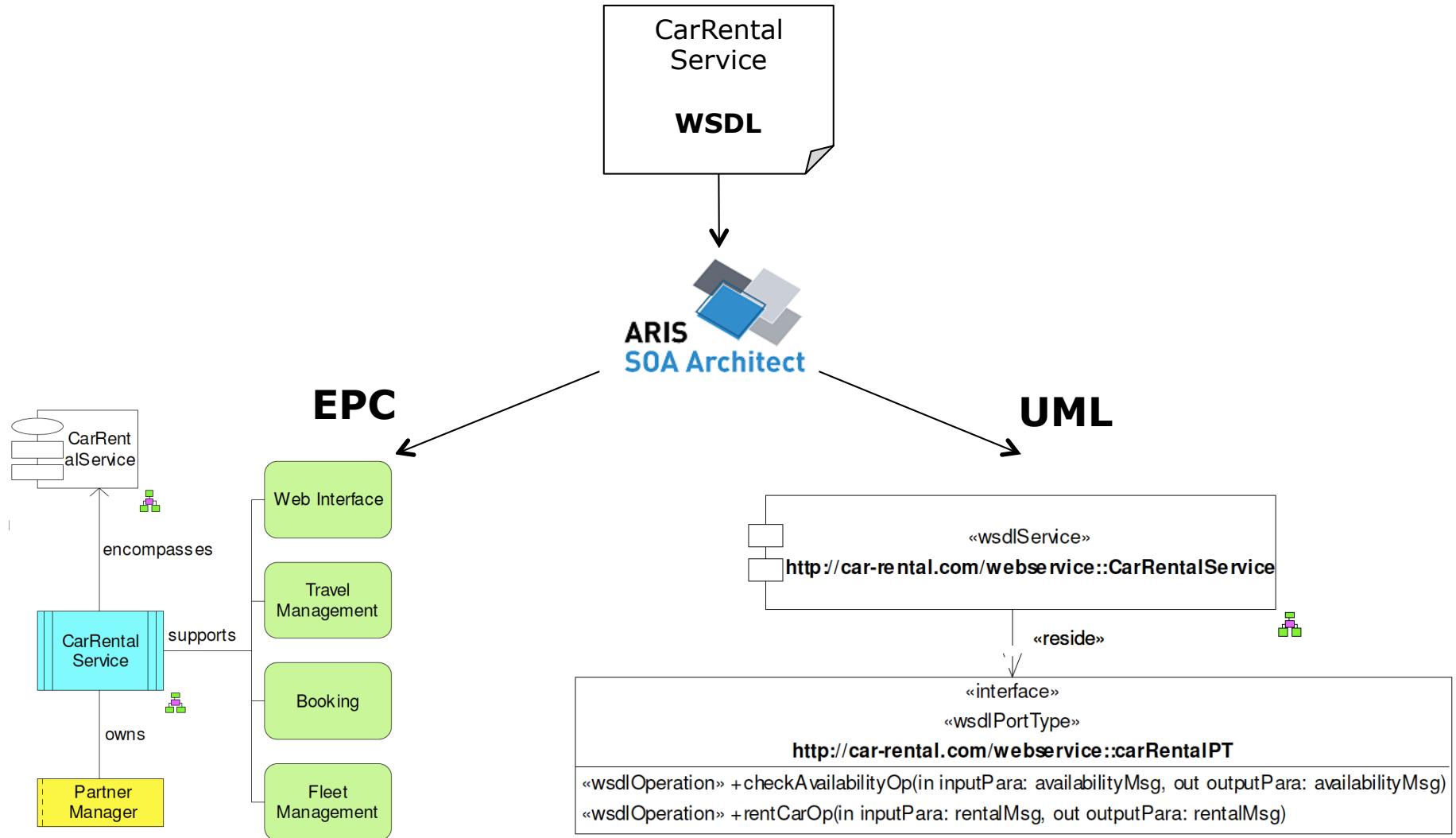
9

- Problem & Background
- **Approach**
 - Overview of the Solution
 - Structural Matching
 - Semantic Matching
 - Assessment & Selection
- Evaluation
- Future Work
- Summary

Solution

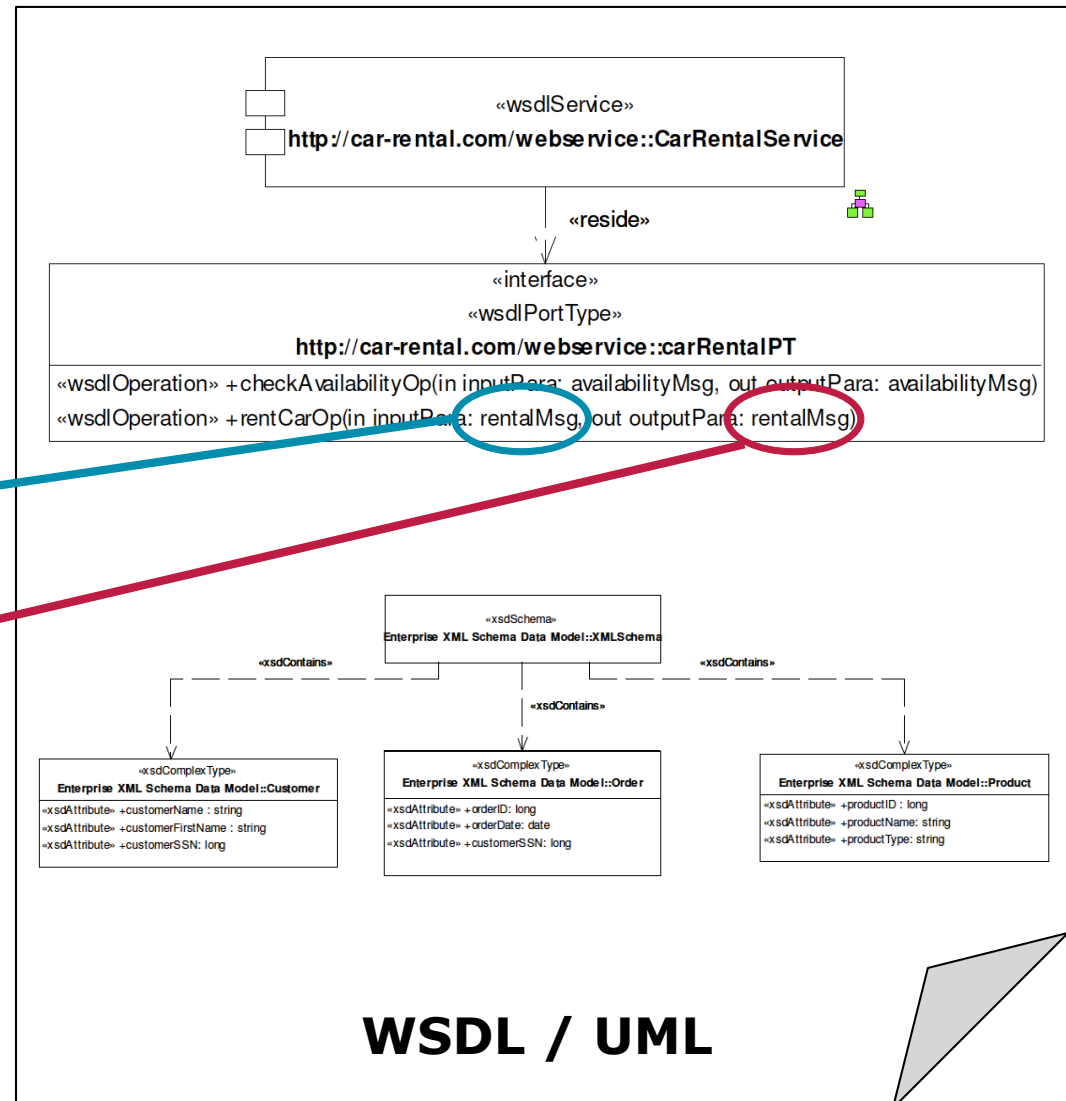
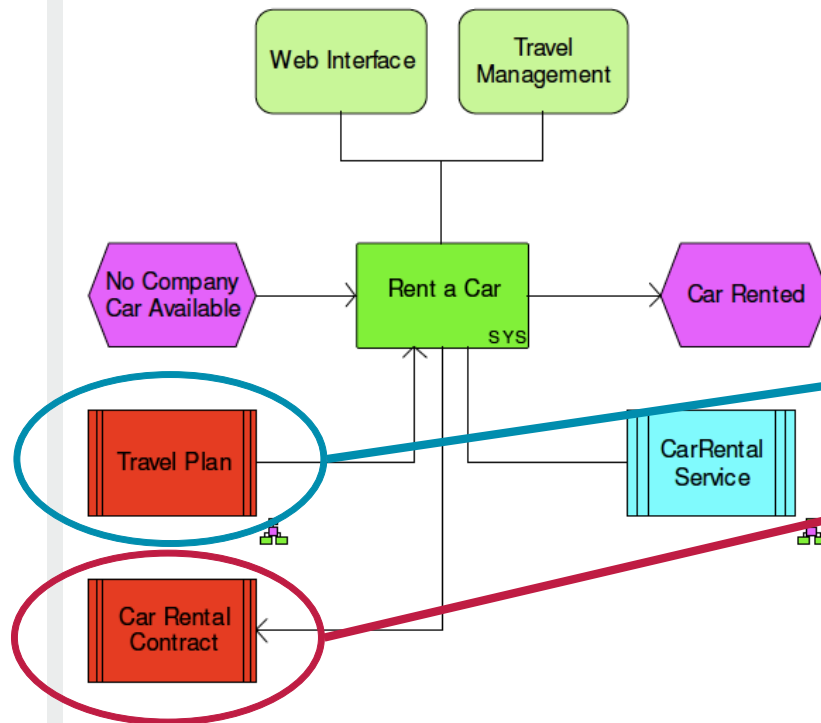
10





Structural Matching

12

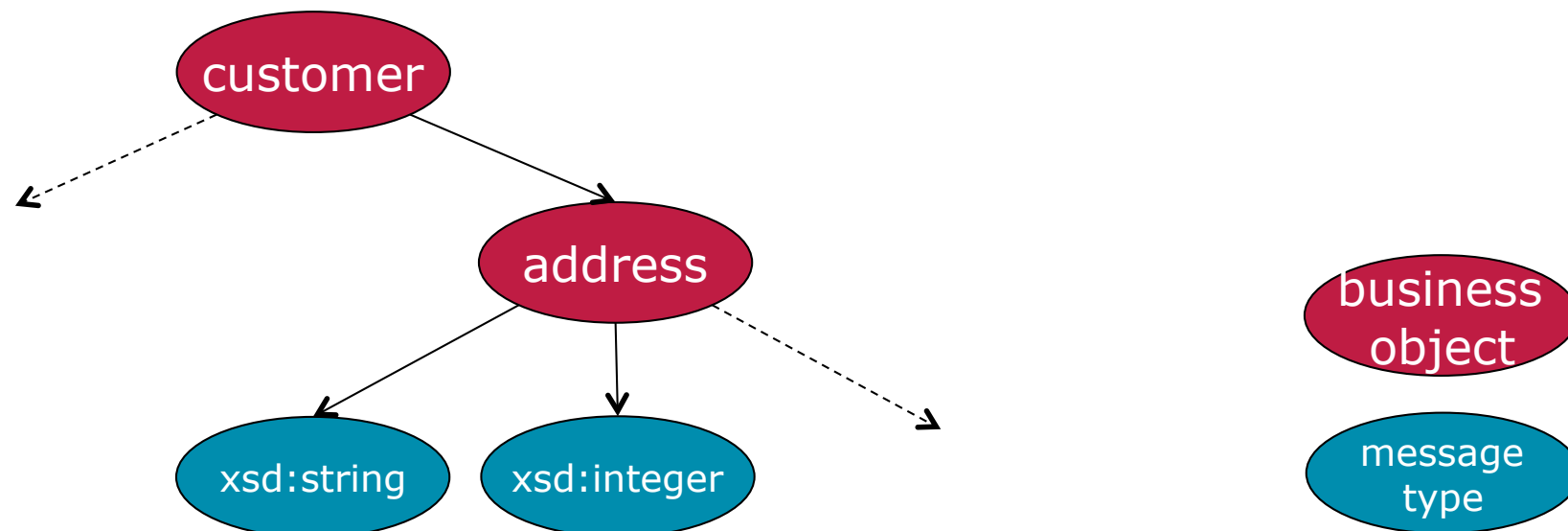


Structural Matching

13

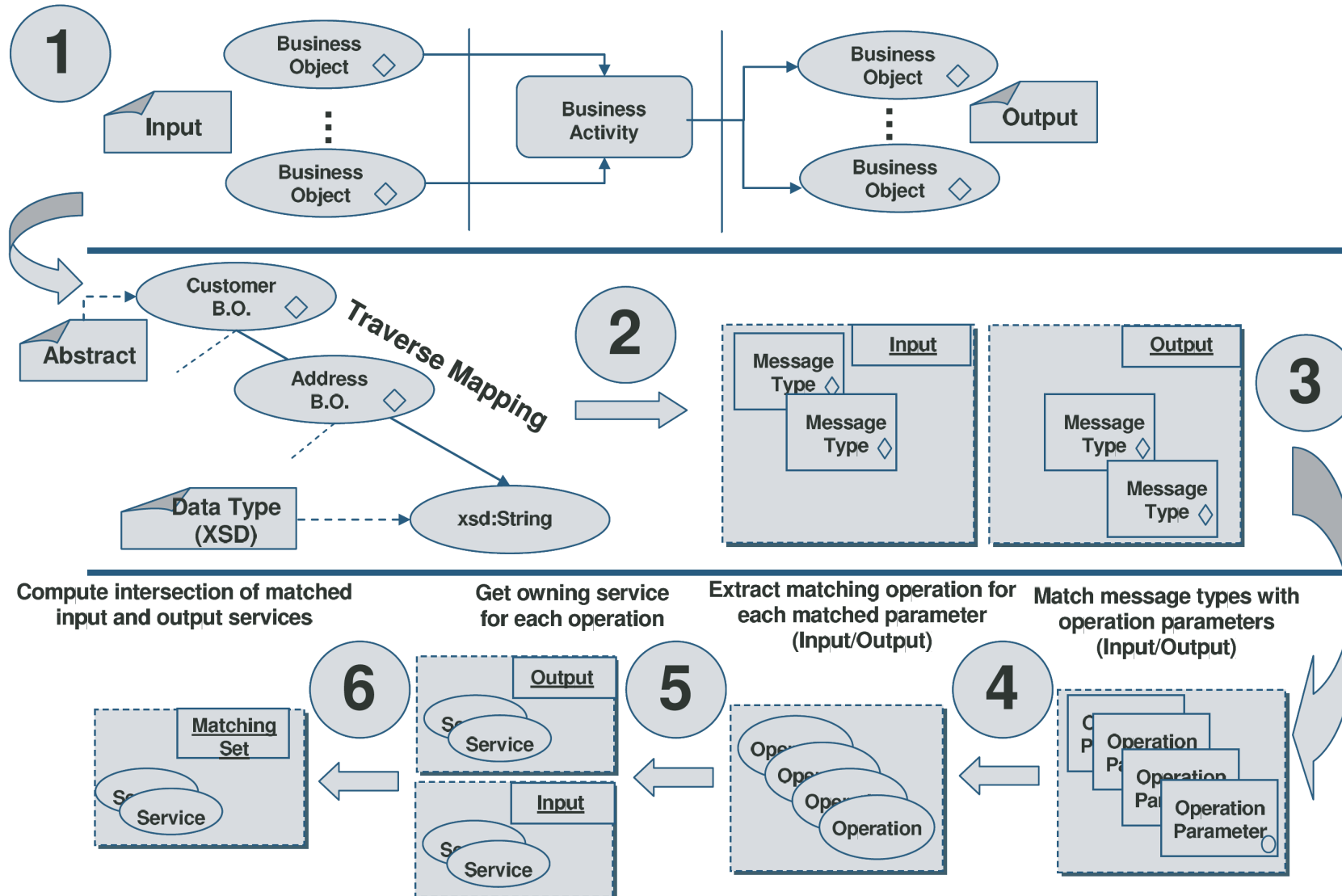
From Business Objects to Message Types

- Business objects are on a conceptual modeling level
- Web Services use message types to define their input and output
- Mapping from business objects to technical data structures needed



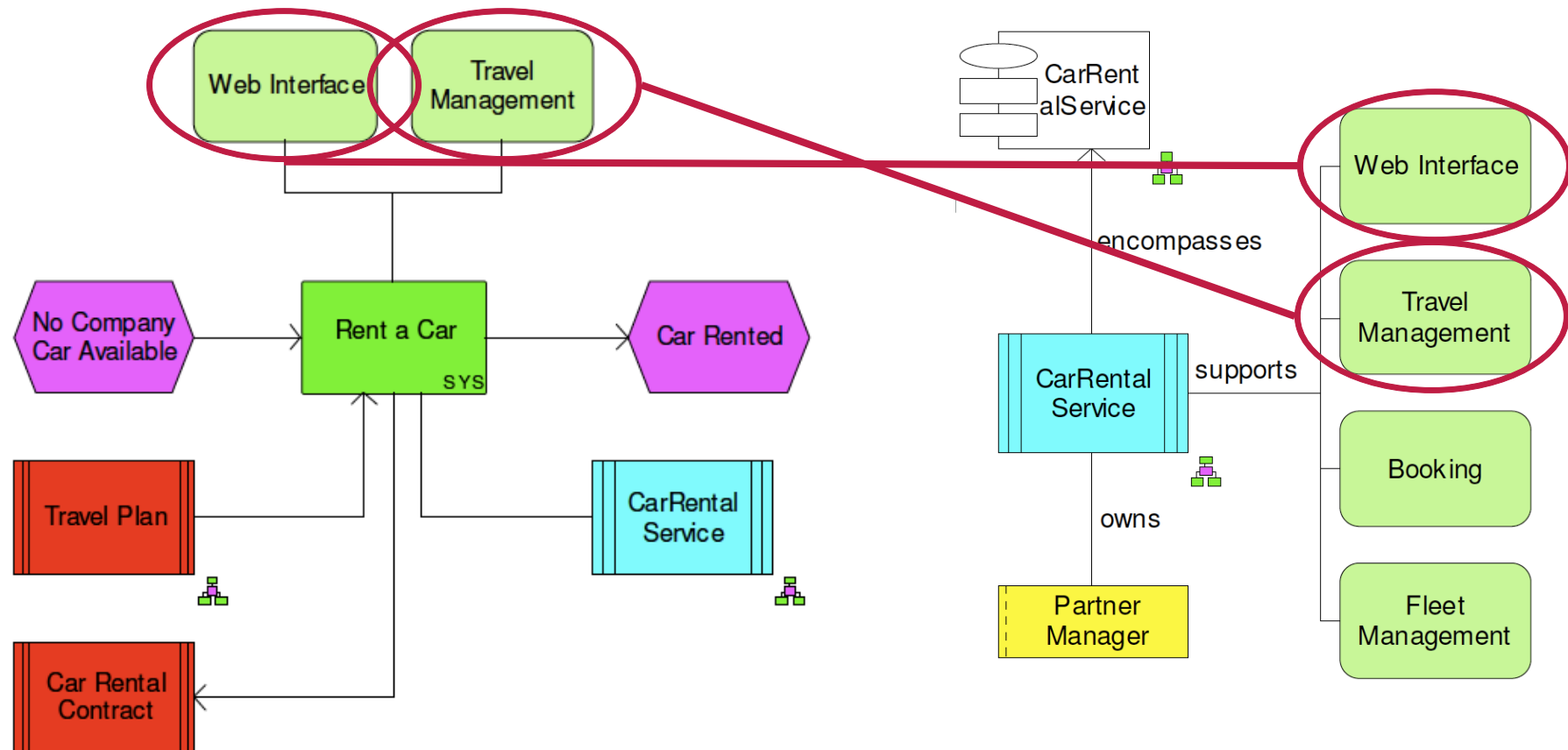
Structural Matching

14



Lightweight Semantic Matching

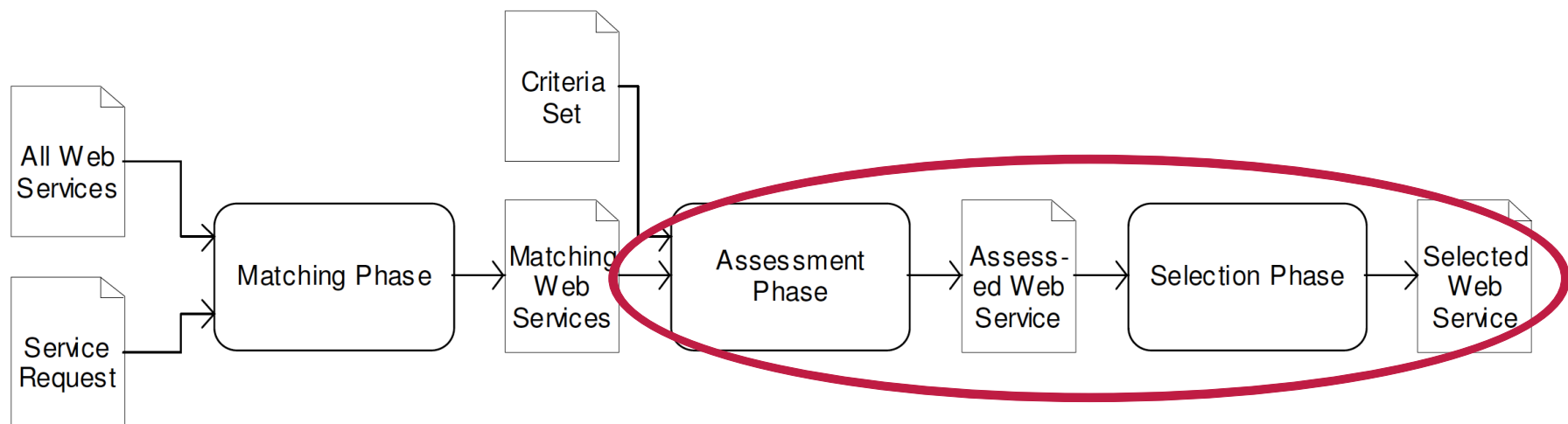
15



Assessment & Selection

16

- Unite results of both matching algorithms (→ mixed strategy)
- User assesses results based on:
 - Service name and description
 - Supported business objects
 - Other contexts in which the service is used
- Finally selects one service



Agenda

17

- Problem & Background
- Approach
- **Evaluation**
 - Matching: Structural vs. Semantic
 - Strength & Weaknesses
- Future Work
- Summary

Matching: Structural vs. Semantic

18

Structural Matching

- Fascinates technical oriented users
- Requires an information architecture

Semantic Matching

- Easy to understand for non-technical users
- Requires a taxonomy
- Imported services need to be tagged

Strengths

- Involves business experts in process implementation
- Leads to a better common understanding between business and IT
- Alternative matching approaches for improved acceptance

Weaknesses

- Only works for a managed repository of web services
- Requires that users stick precisely to the taxonomy

Agenda

20

- Problem & Background
- Approach
- Evaluation
- **Future Work**
- Summary

Future Work

21

Future work proposed in the paper

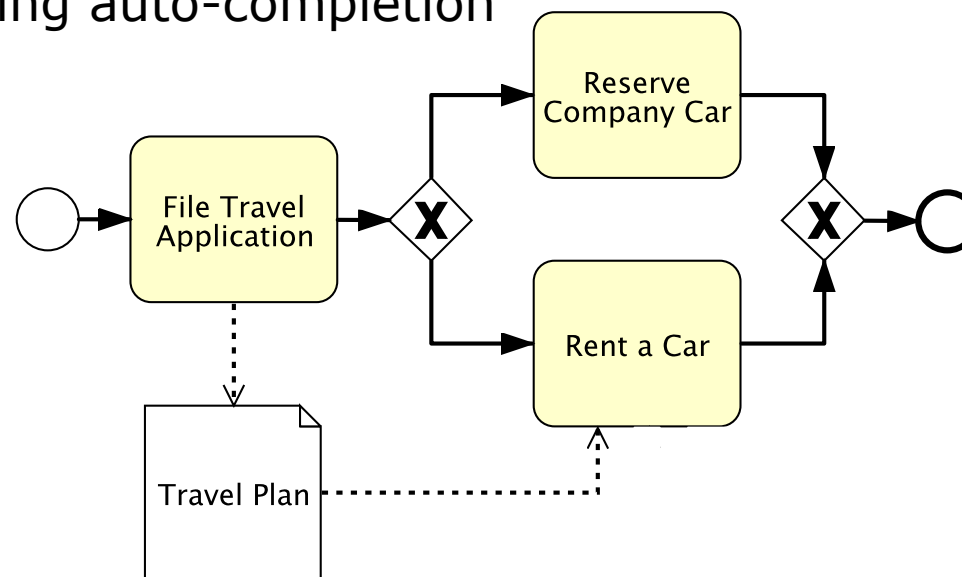
- Improve performance & scalability
- Allow more sophisticated taxonomies
- Generalize approach to support any kind of service
- Conduct a user study

Possible Enhancements

22

Make matching more flexible

- Suggest services that require additional inputs / outputs
 → Modeling auto-completion



Agenda

23

- Problem & Background
- Approach
- Evaluation
- Future Work
- **Summary**

- Bridge gap between business and IT by letting business experts bind business process activities to web services
- Two alternative matching approaches for service discovery
- Structural matching based on a mapping between business object and message types
- Lightweight semantic matching using tags
- Integrated in ARIS SOA Architect

Questions?