

Semantic Web Technologies II

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KASWS – Karlsruhe Semantic Web Services Tutorial

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Agenda

- Recap
- Process composition
 - Rent a movie

Recap

- Web services
 - SOA
 - Software paradigm
 - Standards
- Semantic Web services
 - Description formalism
 - KASWS

Current Approaches: WSMO, OWL-S

- Top-down approaches
- provide highly expressive frameworks
 - Can support automation for discovery, composition
 - Despite promising results, large-scale uptake is still to be witnessed
 - A limitation is their complexity
 - From computational and
 - From knowledge-acquisition perspective
- Even worse: lack of support for **dynamics & mobility**, which are essential for services (and processes)

- Process formalism
 - Pi calculus
 - Allows for formal semantics
 - Overcomes mentioned shortcomings
- Covers services
 - Static and dynamic Web sites and Web pages can also be modeled as services
- Dynamics
- Mobility

Hands-on

- Purpose: understand challenges
- Compose a process
 - Rent a movie

First Step

- Discover a movie rental service
 - User query to a repository (service search engine)
 - Query contains
 - Functional properties
 - Rental, movies, DVD, shipping, Germany, ...
 - Non-functional properties
 - Pay as you go, low price, ...
 - Requires semantic description of services
 - May ranks search results, using non-functional properties

Movie Rental Activities



NETFLIX Buy / Redeem Gift Member Sign In

Free, fast DVD delivery in about 1 business day! [Click here to watch a video and learn more](#)

Rent what you want
Just point and click to add movies & TV episodes to your list from over 100,000 titles.

Receive what you wanted
We rush DVDs from your list with fast, free delivery in about 1 business day.

Watch when you want
Keep each movie as long as you want.

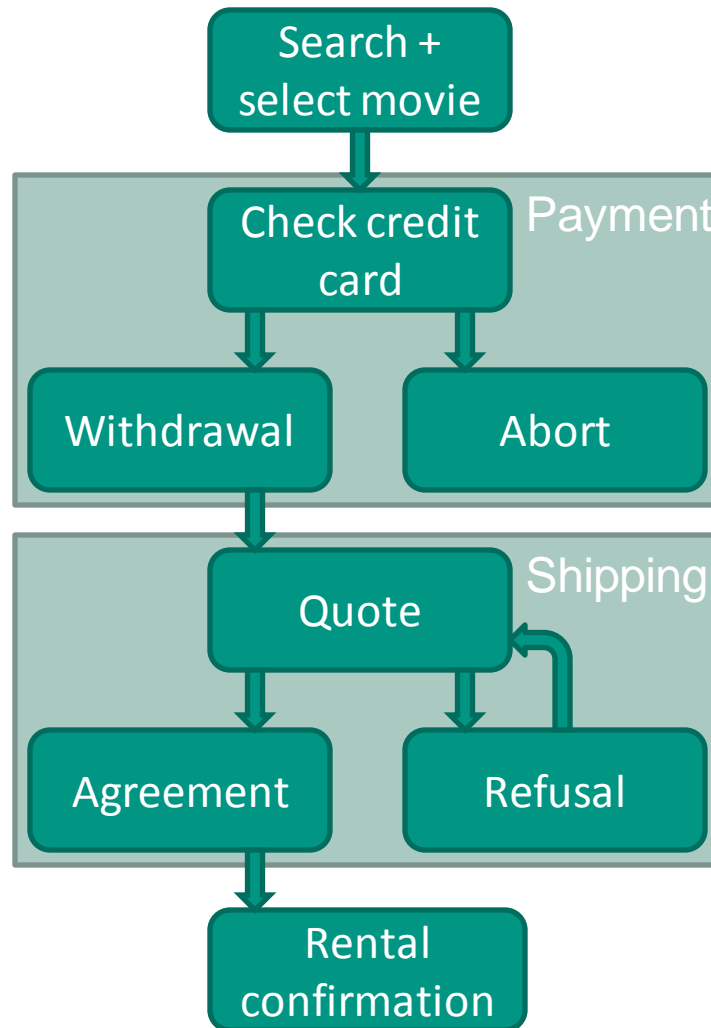
Exchange as often as you want
Simply return 1 movie in its prepaid envelope to get another - as often as you like.

PLUS

Streaming instantly to your TV
As a bonus to your DVDs by mail, instantly watch some movies on your TV over the Internet - anytime!
[Mouse over to learn more>>](#)

- Login
- Selection
- Payment
- Shipping

Process Steps (very informal)



Process Entities

- Client / user
- Movie Rental Company
- Credit Card Vendor
- Two shipping providers

Process Composition Challenges

- Choreography
 - Find proper services
 - Here, bargain the communication pattern
- Data flow
 - Not considered in depth
 - Semantics and syntax
- Semantics
 - Must describe all process resources, i.e., entities and data

Movie Rental Process Extension

- Semantic SPKI authentication
 - Age verification
- Credentials
 - Certificates that prove truth of non-functional properties
- Policies of trust required
 - E.g., allow / deny all, except for following issuers x, y, z.

Summary

- Semantic Web services description
 - Today's focus was
 - What to model
 - How to model
 - How to compose
 - But not the technologies or the pi calculus notation