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A Generic Framework for the Exchange and Usage of Semantically Enriched Information

Project of the Darmstadt University of Technology within the competence network „New Services, Standardization, Metadata" (bmb+f)

Bundesministerium
für Bildung
und Forschung

Outline

- Motivation / Goals of the Project

- Web Services

- Digital Library Services for Scientists

- Applications

- Cooperation / Clearinghouse

Motivation

- Known problems for integration
  - Distribution of information / Heterogeneity
  - Development technology-driven / short cycles of innovation
- "Web Services" (W3C) as a promising standard
- Framework for scientific use of information is missing

Standards

- Standardization as a part of the problem
  - Standardization is research
  - Standardization of own developments gives return on investment
  - Standards: high/low level of details
- Missing specs for Digital Library-Services
  - Background „dl-konzepte": concepts for the improvement of scholarly information systems
  - Domain specific solutions required

Requirements

- Scope: scholarly information within scientific net(work)s
- (Technical & organizational) support of distributed systems
- Light-weight technology
- Support of dynamic changes
- Support of a (domain specific) view on resources

Goals

- Specification of DL-Services
- Generic Framework supporting the implementation of scientific
  - portals
  - peer2peer networks
  - workspaces
- Organizational issues

Web Services - Basics

- Again: this is about the W3C standard
- Remote procedure calls via HTTP
- Supports interaction of distributed, loose coupled and reusable software components
- Integration of legacy systems / middle-ware for heterogeneous networks
- Openness: Machine readable description available (WSDL) – accessible via public (UDDI-) Registries

Provision of Web Services
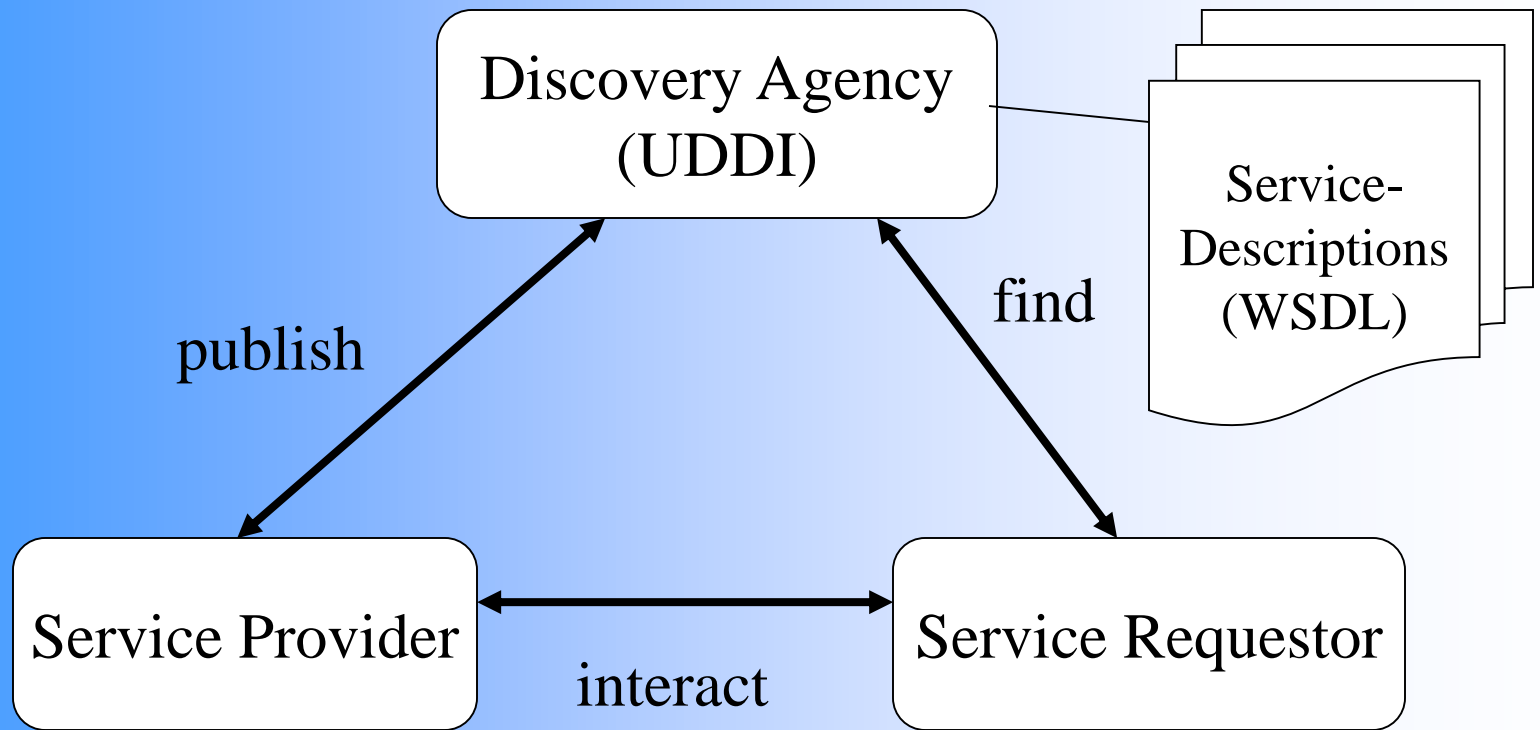
Scenario: Web Services based Infrastructure for Digital Libraries
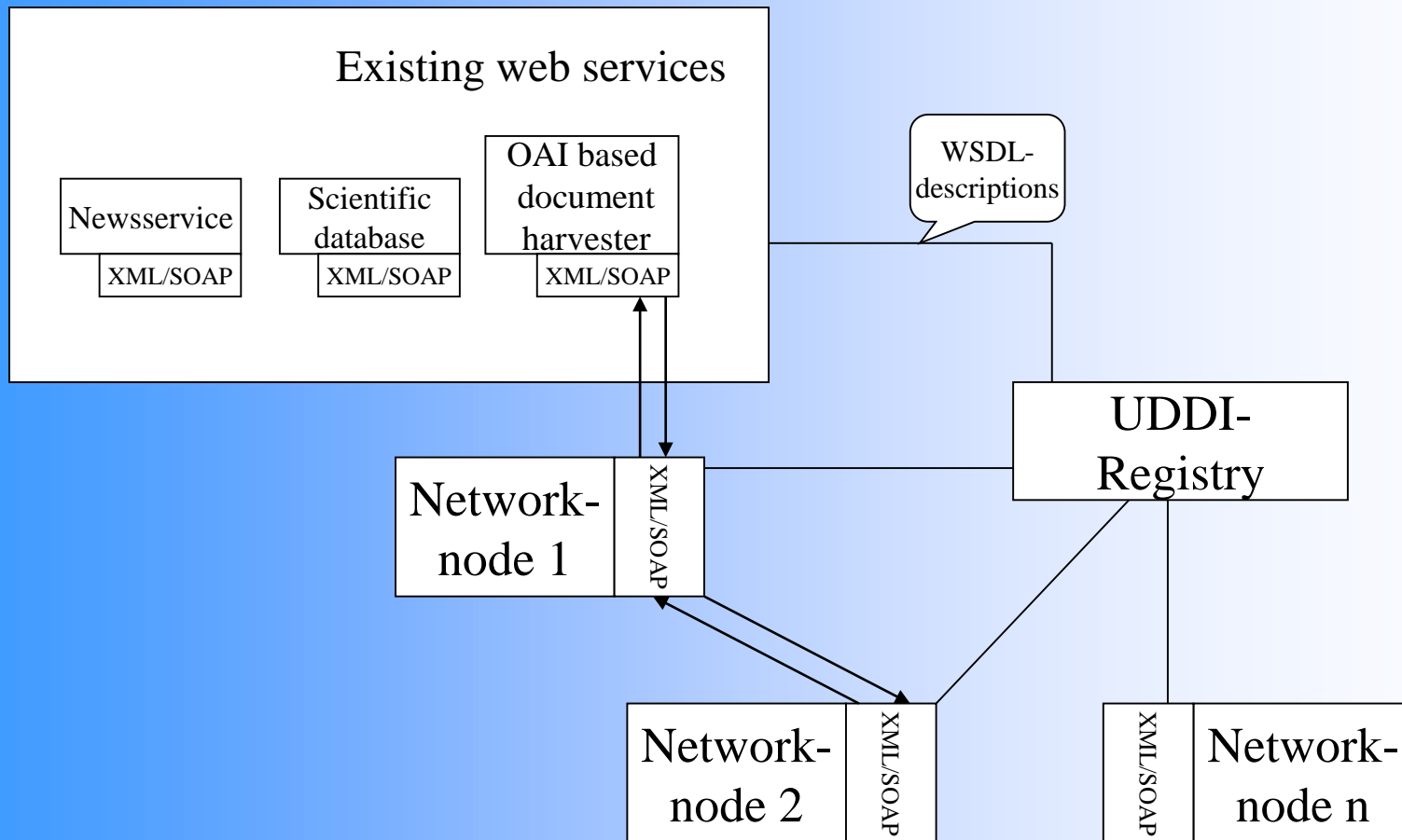
WSDL – Limitations of the Standard

- Still undergoing changes
- Tries to support different paradigms
  - Object orientation
  - Functional programming
  - (Relational) database access
- Some transformations will need support by specialized wrappers

DL-Services for Scientists

- Services: logical view
- Generalization of Access and Formats
- Type system / Ontologies

DL-Services (logical view)

Service (user's perspective) → Metamodel
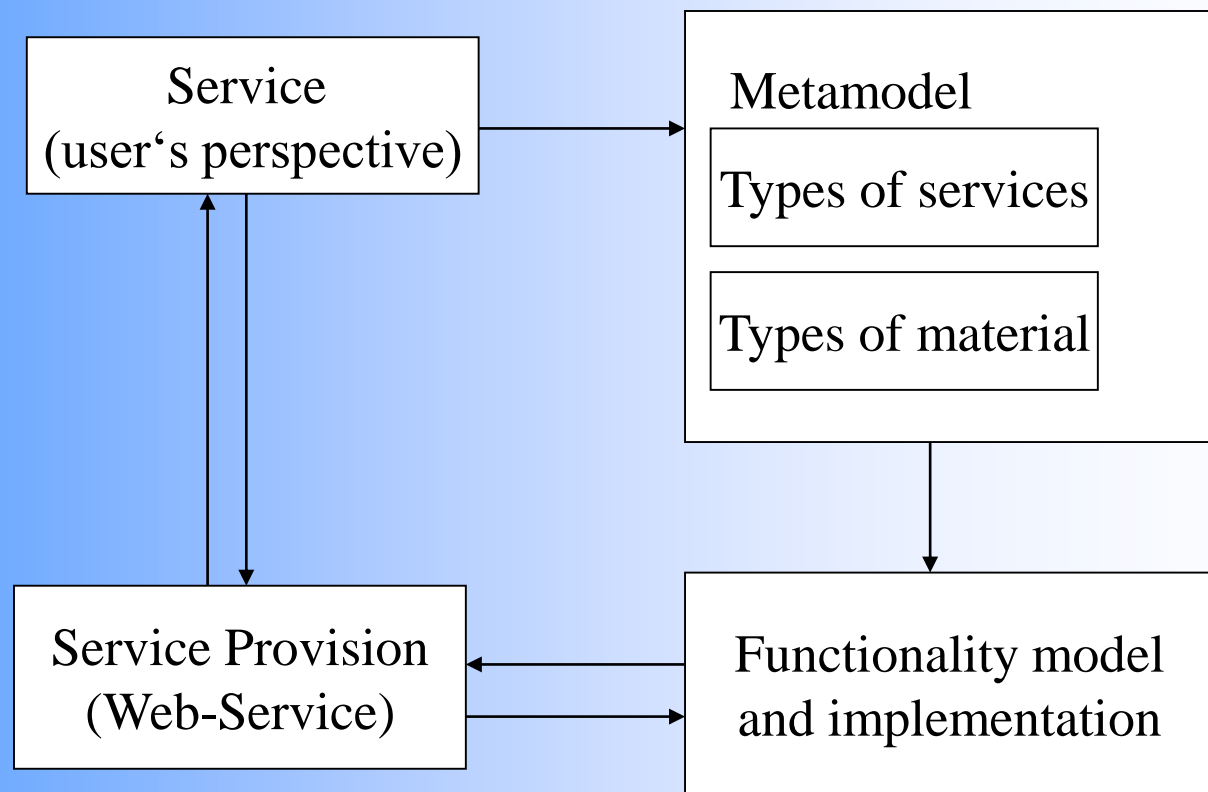
Metamodel
- Types of services
- Types of material

Service Provision (Web-Service)

Functionality model and implementation

Access and Formats

Standardization of access	Standardization of formats/protocols	Task

↓ ↓

Types of services and material	Interface specifications	with different level of generalization

Metamodel
of the framework

WSDL descriptions
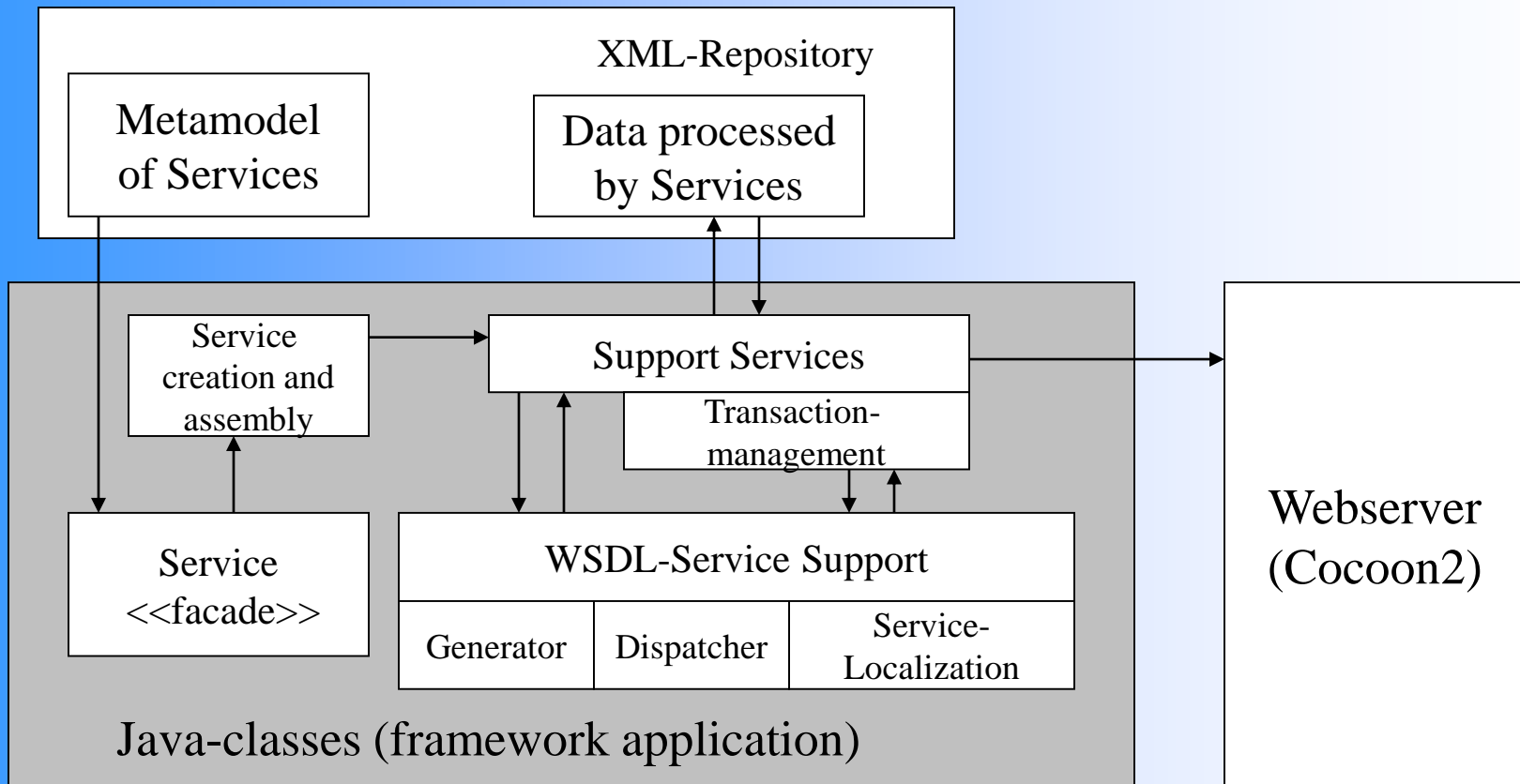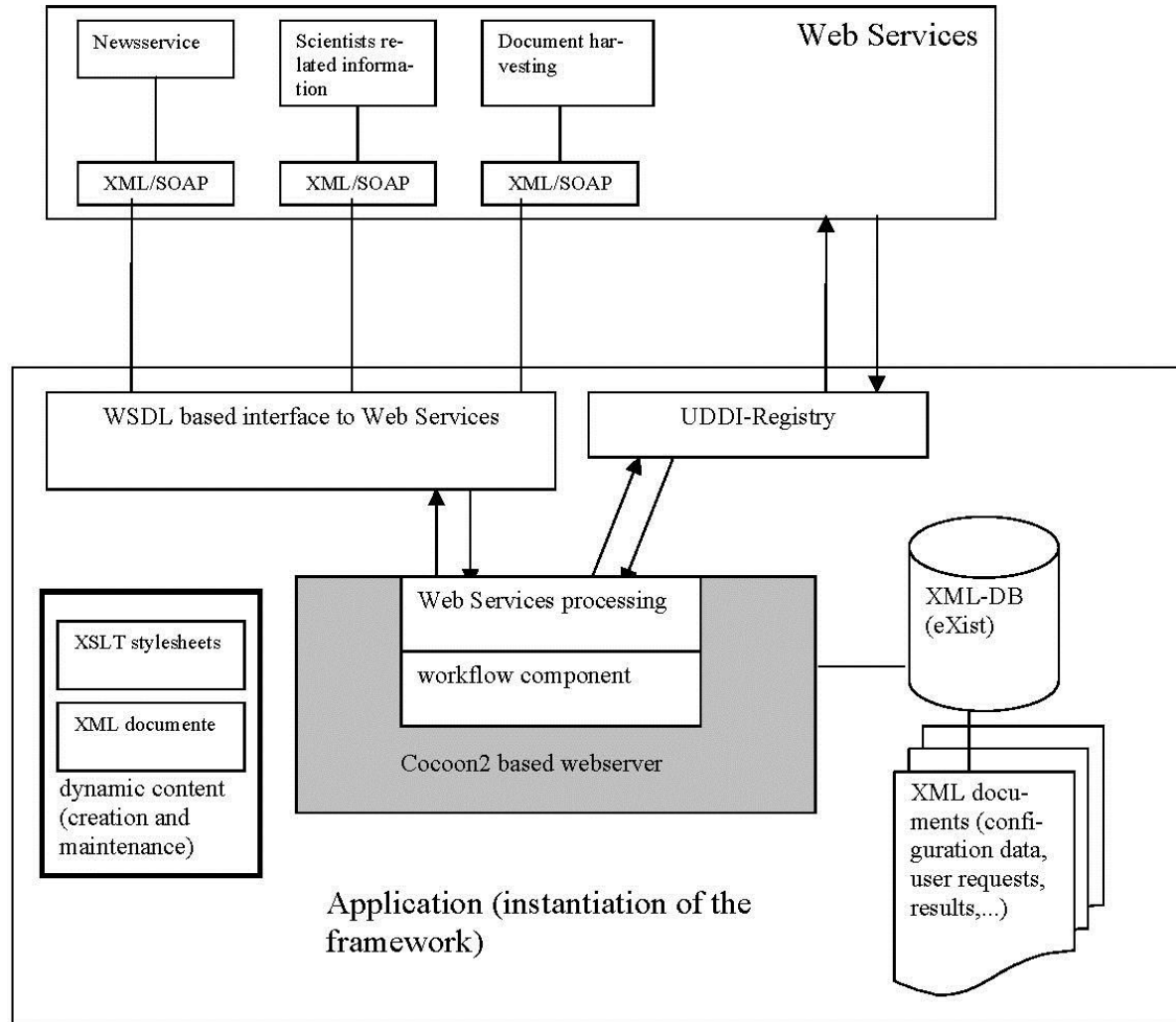
KOS related DL- Services

- Services allowing access to thesauri / ontologies or concepts (eg Query expansion)

- More use cases?

- Problem in the context of our framework: Modeling with RDFS/OWL does not integrate into XML

Framework (logical view)

Framework (instantiation)

Development Activities

Motivation / Goals of the Project

Web Services

Digital Library Services for Scientists

Applications

Cooperation / Clearinghouse

- Utilizing upcoming standards or specifications (e.g. JXTA)
- Ability to support the different types of use cases (portal, P2P, workspace)
- Focus on application supporting the maintenance of content within a scientific portal for science nets

Motivation / Goals of the Project Web Services Digital Library Services for Scientists Applications Cooperation / Clearinghouse	# Cooperation/Clearinghouse - Importance of people behind standardization effort - Cooperation on a national level (network of competence) - Utilizing international accepted standards - Open for cooperation