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The Personal Reader: A Framework for Developing and Maintaining Web-Content Readers

Nicola Henze

Learning Lab Lower Saxony,

September 15th, 2004



Outline

Idea: Personalization for the Semantic Web

The Personal Reader: A framework for designing, implementing and maintaining Web Content Readers

Personal Reader Instances:

- A Personal Reader for e-Learning
- A Personal Publication Reader

Summary and Current Work



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Idea: Personalization for the Semantic Web



Personalization Functionality for the Semantic Web

- Provide user guidance based on semantically enriched information. Situation:
 - Machine readable semantics
 - Distributed information resources & metadata
 - Ontological knowledge
- Goal: reason over distributed information resources, ontological knowledge, user information, etc. in order to provide personalized views / guidance / search and selection support / . . .
- **Open World, Re-usable!**
[Bringing personalization functionality to the Semantic Web means to solve the open corpus problem in Adaptive Hypermedia]
- Think of Personalization Functionality as „Services on the Web“!

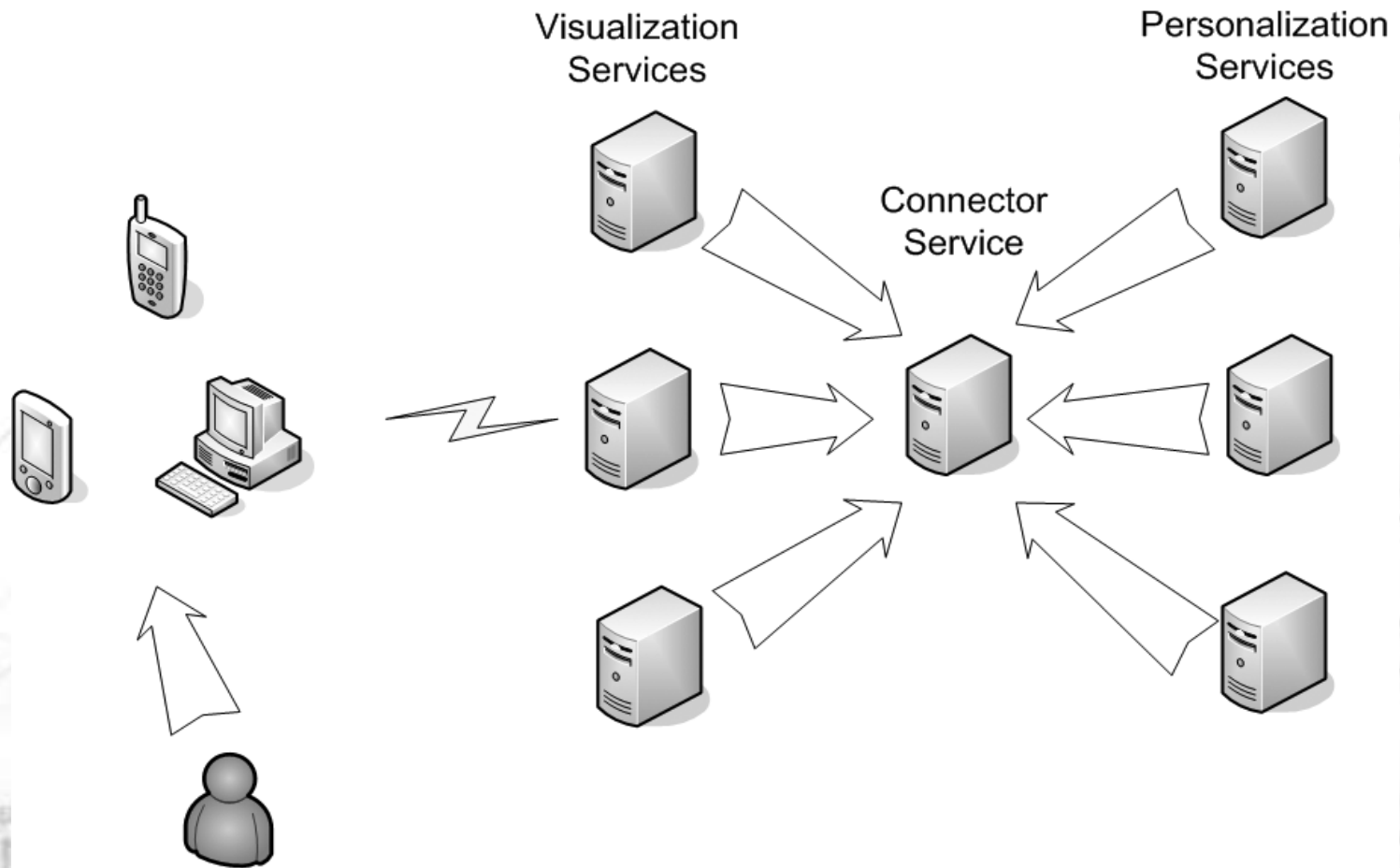


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Architecture: The Personal Reader



Architecture of the Personal Reader





Data Flow

User is clicking on a link

Visualization Service passes request to Connector

Connector searches for available (semantic) information of the link target, user model information, etc., and sends a request to all registered personalization services, including found information, the requested page, user model information, etc.

Each (registered) personalization services answers the request

Connector provides all results to Visualization Service

Visualization Service provides result to user, depending on user's device capabilities



Data Flow

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rdf request

Connector searches for available (semantic) information of the link target, user model information, etc., and sends a request to all registered personalization services, including found information, the requested page, user model information, etc.

rdf request

Each (registered) Personalization Service answers the request, maybe invoking further Services

rdf answer

Connector provides all results to Visualization Service

rdf answer

Visualization Service provides result to user, depending on user's device capabilities



Data Flow

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rdf answer

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rdf answer

Ontology of Adaptive Functionality

Visualization Service provides result to user, depending on user's device capabilities



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A Personal Reader for e-Learning



A Personal Reader for Learning Resources

- domain: Java Programming
- learning resources: The SUN Java Tutorial (freely available online tutorial)
- uses:
 - personalization service for **displaying course materials**
 - personal **recommendation service**
 - personal **search service**, linking course materials directly to appropriate content in the JAVA API
- semantic information used:
 - rdf description of learning resources
 - domain ontology

[rdf descriptions and ontology available at <http://www.personal-reader.de/resources.xml>]

PERSONAL READER

Nicola Henze



Title

java Tutorial

Arrays

DONE

AGAIN

Generalizations

Object Basics and Simpl...

Details

Arrays of Objects

Arrays of Arrays

Creating and Using Arrays

Copying Arrays

Summaries

Summary of Arrays

Exercises

Questions and Exercises...

Again

Arrays

Classes and Inheritance

logout

The Java™ Tutorial



[Start of Tutorial](#) > [Start of Trail](#) > [Start of Lesson](#)

[Search](#)

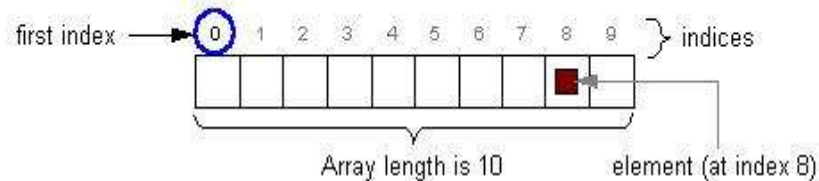
[Feedback Form](#)

Trail: Learning the Java Language

Lesson: Object Basics and Simple Data Objects

Arrays

An array is a structure that holds multiple values of the same type. The length of an array is established when the array is created (at runtime). After creation, an array is a fixed-length structure.



An *array element* is one of the values within an array and is accessed by its position within the array.

If you want to store data of different types in a single structure, or if you need a structure whose size can change dynamically, use a `Collection` implementation, such as `Vector`, instead of an array. Refer to [Collections](#)♦ for a complete trail on the subject. This section covers these array-related topics:

- [Creating and Using Arrays](#)♦
- [Arrays of Objects](#)♦

PERSONAL READER
Peter Dolog

search

Title
Java Tutorial
 Arrays
DONE AGAIN

Generalizations
 Object Basics and Simpl...

Details
 Arrays of Objects
 Arrays of Arrays
 Creating and Using Arrays
 Copying Arrays

Summaries
Summary of Arrays

Exercises
Questions and Exercises...

Again

logout

The Java™ Tutorial
Start of T

Trail: Learning the Java Language
Lesson: Object Basics and Simple Data Ob

Arrays

An array is a structure that holds fixed-length structure.

An *array element* is one of the

If you want to store data of different types, use a `Vector`, instead of an array. Refer to the following links:

- [Creating and Using Arrays](#)
- [Arrays of Objects](#)
- [Arrays of Arrays](#)
- [Copying Arrays](#)
- [Summary of Arrays](#)
- [Questions and Exercises](#)

Start of T

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ELENA Personal Learning Assistant
for SMART SPACE FOR LEARNING Peter Dolog & Michael Sintek
Information Society Technologies

Personalized Search Service

User:
default

Selected concepts:
Array
(none)

Query results:

PREco	Reco	Title	Description	Concepts
	<input checked="" type="checkbox"/>	ByteArrayOutputStream (Java 2 Platform SE v1.4.2)	?	http://webbase.learninglab.uni-hannover.de:9000/pla/ACM_java.rdf#Array; byte;
	<input checked="" type="checkbox"/>	LongBuffer (Java 2 Platform SE v1.4.2)	?	http://webbase.learninglab.uni-hannover.de:9000/pla/ACM_java.rdf#Long; http://webbase.learninglab.uni-hannover.de:9000/pla/ACM_java.rdf#Array; byte; if; new Operator; http://webbase.learninglab.uni-hannover.de:9000/pla/ACM_java.rdf#Byte; http://webbase.learninglab.uni-hannover.de:9000/pla/ACM_java.rdf#this; long
	<input checked="" type="checkbox"/>	Blob (Java 2 Platform SE v1.4.2)	?	http://webbase.learninglab.uni-hannover.de:9000/pla/ACM_java.rdf#Array; byte; http://webbase.learninglab.uni-hannover.de:9000/pla/ACM_java.rdf#Byte

Manage courses

Name	Title	Startpage	Description(URL)	Ontology(URL)	Action
jtut	Java Tutorial	http://java...tutorial/index.html	http://www.p...n_java_tutorial.rdf	http://www.p...f/java_ontology.rdf	Edit Remove
semweb	Semantic Web	http://www.k...de/~henze/semweb04			Edit Remove

Add course

Name

Title

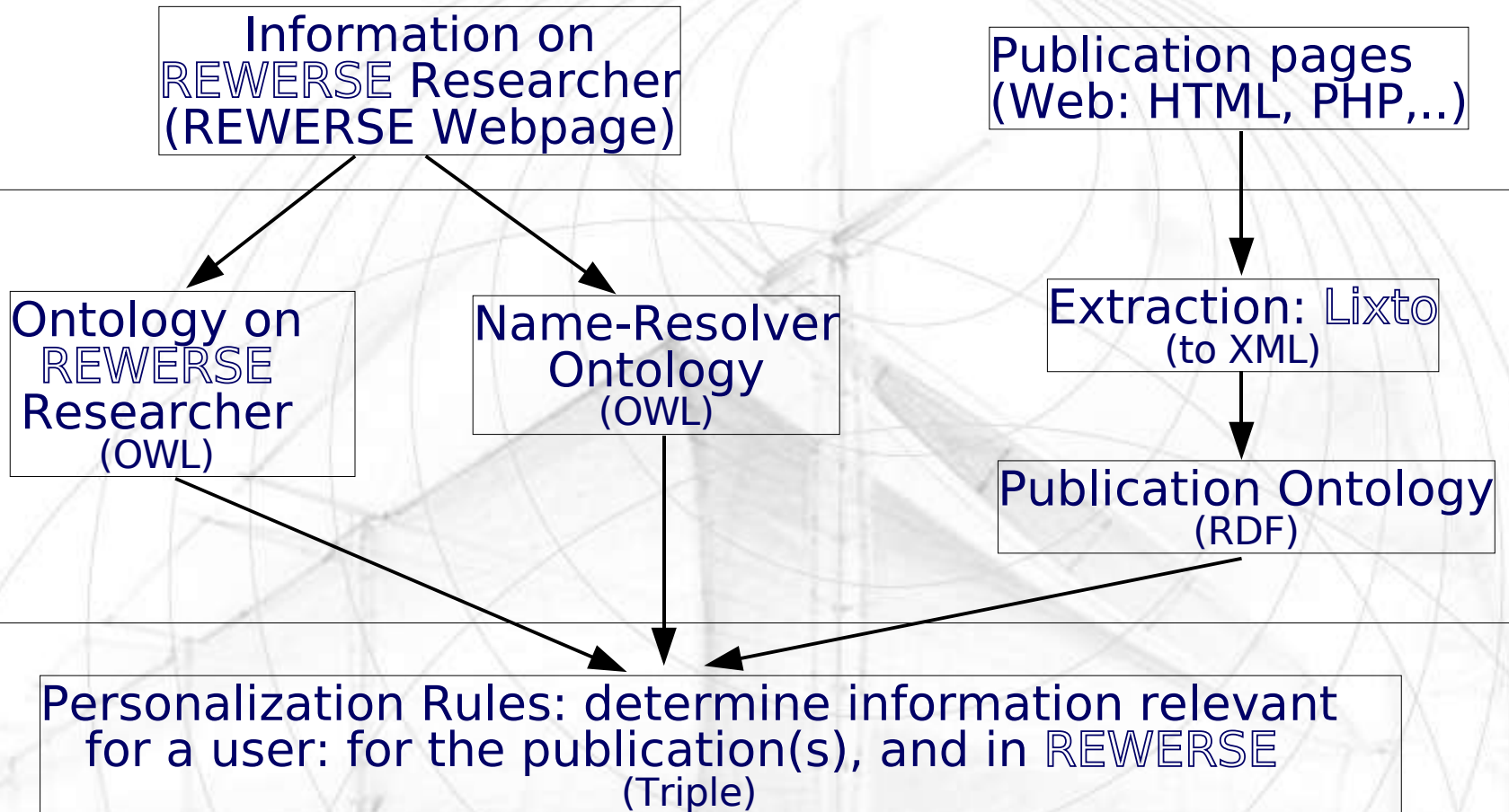
Administration Interface of the Personal Reader for e-Learning



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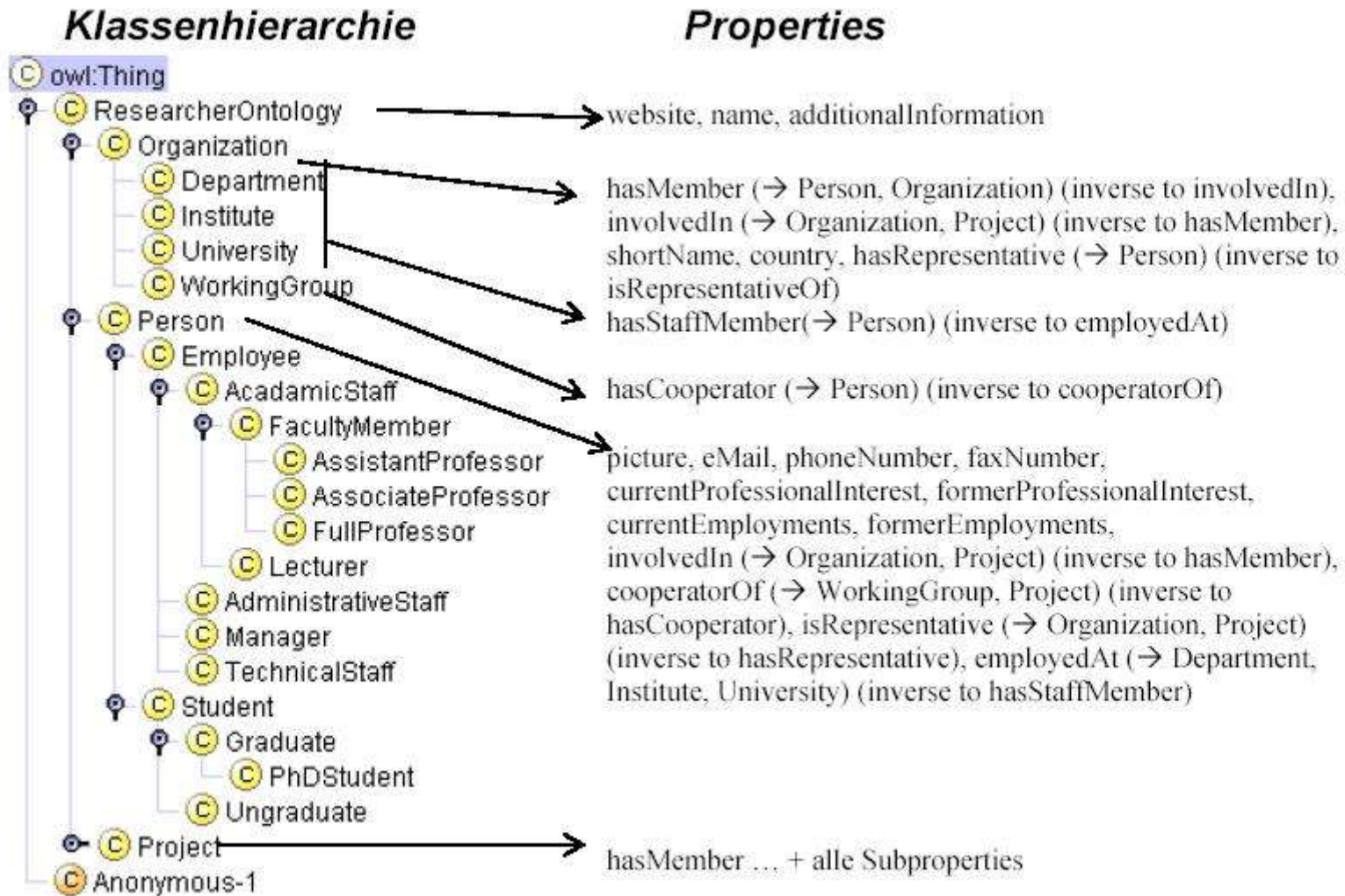
A Personal Publication Reader

Personal Publication Reader



Display of Results in Personal Reader

Excerpt of the REVERSE Researcher Ontology



Excerpt of the REVERSE Publication Ontology

```
<rdf:Description rdf:about="ftp://ftp.ics.forth.gr/tech-reports/
    2003/2003.TR320.Knowledge_Representation_Schemes.pdf">
<reverse:origin>University of Heraklion</reverse:origin>

    <reverse:title>Describing Knowledge Representation Schemes :
        A Formal Account</reverse:title>

    <reverse:author>
    <rdf:Seq>
        <rdf:li rdf:resource="#Giorgos Flouris"/>
        <rdf:li rdf:resource="#Dimitris Plexousakis"/>
        <rdf:li rdf:resource="#Grigoris Antoniou"/>
    </rdf:Seq>
    </reverse:author>

    <reverse:year>2003</reverse:year>

    <reverse:link>ftp://ftp.ics.forth.gr/tech-reports/
        2003/2003.TR320.Knowledge_Representation_Schemes.pdf
    </reverse:link>

</rdf:Description>
```



Further Services under development:

- Activity-Based Search
- Assessment and Interactive Exercises

Reasoning Techniques for Personalization

Services under investigation:

- Wlog
- ECA-Rules, Flora2, ...

See REVERSE (reverse.net)
for further information

The screenshot shows the 'Personal Reader' web application. At the top, it displays the user's name 'Nicola Henze'. Below this is a search bar with a magnifying glass icon. The main content area is divided into several sections: 'Title' (showing 'Java Tutorial' and 'Arrays'), 'Generalizations' (with a checked box for 'Object Basics and Simpl...'), 'Details' (with unchecked boxes for 'Arrays of Objects', 'Arrays of Arrays', 'Creating and Using Arrays', and 'Copying Arrays'), 'Summaries' (showing 'Summary of Arrays'), 'Exercises' (with a checked box for 'Questions and Exercises...'), and 'Again' (with checked boxes for 'Arrays' and 'Classes and Inheritance'). At the bottom left, there is a 'logout' button with a downward arrow.



Current Contributors (in alphabetical order):

Peter Baumgartner
Lilia Cheniti-Belcadhi
Peter Dolog
Christian Enzi
Nicola Henze
Marc Herrlich
Dennis Kohlmetz
Wolfgang Nejdil
Raluca Paiu
• Michael Sintek
• Kai Tomaschewski



Summary

- Approach for applying personalization functionality on the Semantic Web:
 - rule-based personalization functionality
 - encapsulated in Web Services
 - towards re-usable Personalization Services
- Architecture of the Personal Reader:
 - designing, implementing and maintaining Web content readers
- Examples:
 - A Personal Reader for e-Learning
 - A Personal Publication Reader



Future Steps

- More complex user interactions, user feedback
- User annotations and management of learning resources
- Implementing a user control center for accessing personalization functionality
- More Personalization Services, more Readers!



Thank you very much for your attention!

You can test the Personal Reader for e-Learning
and download course descriptions and ontologies at

www.personal-reader.de