



Semantic E-Government Portals - A Case Study

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Contents



- Problem:
 - How should a general governmental portal provide information and services to citizens?
- Current situation and limitations:
 - Citizen's eGovernment portal Suomi.fi
- How could the Semantic Web approach help?
 - Case study: Semantic Suomi.fi

Problem: providing governmental information and services to citizens



- Basic difficulties
 - Organizational heterogeneity
 - » Information and services are provided by different governmental bodies in different locations
 - » The user does not necessarily know the organizational structure and who is providing what info/service
 - Interoperability
 - » How to represent heterogeneously produced metadata in an interoperable way?
 - Information accumulation
 - » Citizen's needs cannot always be satisfied by one organization
 - » Accumulation of heterogeneous multiorganizational information and services is needed

Current Suomi.fi portal



- Citizen's eGovernmental portal in Finland
- Link collection of subject areas
 - "Culture and hobbies"
 - "Education and libraries"
 - ...
 - Links annotated by
 - » Short textual descriptions
 - » Set of keywords
 - Edited thematic information pages
- Single-facet approach
 - Yahoo!-like taxonomies of topics and web pages
 - dmoz.org
- Maintained by Ministry of Finance

Suomi.fi home page



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- **Problems addressed**

- Finding relevant services more easily
 - » **Solution:** generalize from single to multifacet search
 - Like in MuseumFinland based on ontologies
 - Flamenco, HiBrowse, ...
- Aggregating content from different organizations
 - » **Solution:** Automatic link recommendation system
 - Aggregates thematic information together
- Testing OntoViews-tool
 - » Tool for building semantic portals
 - » How well can it be adapted to different domains and applications

Multifacet search based on ontologies



- Basic idea of multifacet search:
 - the content can be projected along different views for different user groups
 - Search specified along these views
- Ontologies created for new views
 - Topic (= the original view)
 - Content
 - Audience
 - Life event
 - Region
 - Language

Example: multifacet search



SW-Suomi.fi - Semantic Information Portal

Home | Search | Information (in Finnish) | Show all categories

Concept search:

Topic (group title) (category tree)	Audience (group title) (category tree)	Regional (group title) (category tree)
Home and family (25), Education and libraries (30), Culture and recreation (2), Leisure and travel (10), Transport and navigation (2), Rights and accounts (2), Youth and young life (7), Housing and utilities (10), Language learning and practice (1), Society and citizens (30), Environment and nature (2)	Teachers (2), Finnish clubs (24), Kids (11), Young people (20), Students (12), Faculty (12), Persons and individuals (12), Employees (2), Finnish language (1), Minorities (2), Extended learning (2), Elderly (1), Professional training (1), Citizens (34), Employees (0)	Northern Finland (17), Åland islands (14), Language (group title) (category tree) English (2), Finnish (200)
By content availability (categories) Contact information (14), Electronic services (1), Legal forms (5), Transmission forms (2), Documents and guides (28), Legal documents (14), Forms (2), Statistics (1), Study materials (1)	Life event (group title) (category tree) New born (8), Moving (10), Starting studies (14), Family life (22), Retired (2), Work and career (3)	

Example of a new view: life event



SW-Suomi.fi - Semanttinen informaatioportali Microsoft Internet Explorer

SW-Suomi.fi
A Semantic Information Portal

Search criteria: No search Back to search page | Instructions (in Finnish) Show all categories

Search criteria

Kategoria: Life event

- Life event (57)
 - Birth date (3)
 - Birth certificate (3)
 - Marriage (1)
 - Starting studies (1)
 - Family life (2)
 - Marriage (4)
 - Divorce (1)
 - Change name (2)
 - Childhood (1)
 - Living a child (1)
 - Marriage (1)
 - Married (1)
 - Naming a child (1)
 - Registered relationship (1)
 - Marriage (1)
 - Change name (1)
 - Religion (1)
 - Work and career (3)
 - Start work (1)
 - Second employment (1)

Single facet selection done: Having a child



The screenshot shows the SW-Suomi.fi website interface. The main heading is "SW-Suomi.fi A Semantic Information Portal". Below the heading, there is a search bar and navigation links. The search criteria are set to "Category: Having a child". The results are grouped by category "Having a child". The first result is "Having a child, hie... 23". The second result is "Lapsen vanhempien...". The third result is "Lapsen vanhempien...". The fourth result is "Lapsen vanhempien...". The fifth result is "Lapsen vanhempien...". The sixth result is "Lapsen vanhempien...". The seventh result is "Lapsen vanhempien...". The eighth result is "Lapsen vanhempien...". The ninth result is "Lapsen vanhempien...". The tenth result is "Lapsen vanhempien...".

Multiple facet selection done: Having a child & Legal information



The screenshot shows the SW-Suomi.fi website interface. The search criteria are set to "Laki" (Law). The facets selected are "Topic" (Group: 486) and "Life event" (Group: 10). The search results are grouped by category, showing "Laki" (Suomalainen lakitietokeskus) with 11 items. A red box highlights the link "Suomalainen lakitietokeskus" in the search results. A red arrow points from the text "Link to the actual page somewhere on the web" to this link.

Link to the actual page
somewhere on the web

Link of interest found: Having a child & Legal information



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SW-Suomi.fi - Svenska information portal - Microsoft Internet Explorer

SW-Suomi.fi
A Swedish Information Portal

Svealand | Svealanden | Svealanden | Svealanden

Search

Time

- [Svealanden](#)
- [Svealanden](#)
- [Svealanden](#)

The content

- [Svealanden](#)
- [Svealanden](#)

Webpages

- [Svealanden](#)

Life events

- [Svealanden](#)
- [Svealanden](#)
- [Svealanden](#)
- [Svealanden](#)

Business

- [Svealanden](#)

Expenses

- [Svealanden](#)

Svealanden

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- [Svealanden](#)

Basic idea of semantic content aggregation



- Create a knowledge base KB
 - Create a set of ontologies O
 - Annotate content items metadata using O
- Parse KB into a logic program (SWI-Prolog)
- Create rules for linking related content items
 - Find links
 - Organize links into groups
 - » e.g. "Links for the same life event"
 - Explain links by labels
 - » e.g. "Starting studies"

Example: semantic recommendations of a link



The screenshot shows the SW-Suomi.fi website interface. The main content area displays search results for the query "SW-Suomi.fi". The results are organized into several sections:

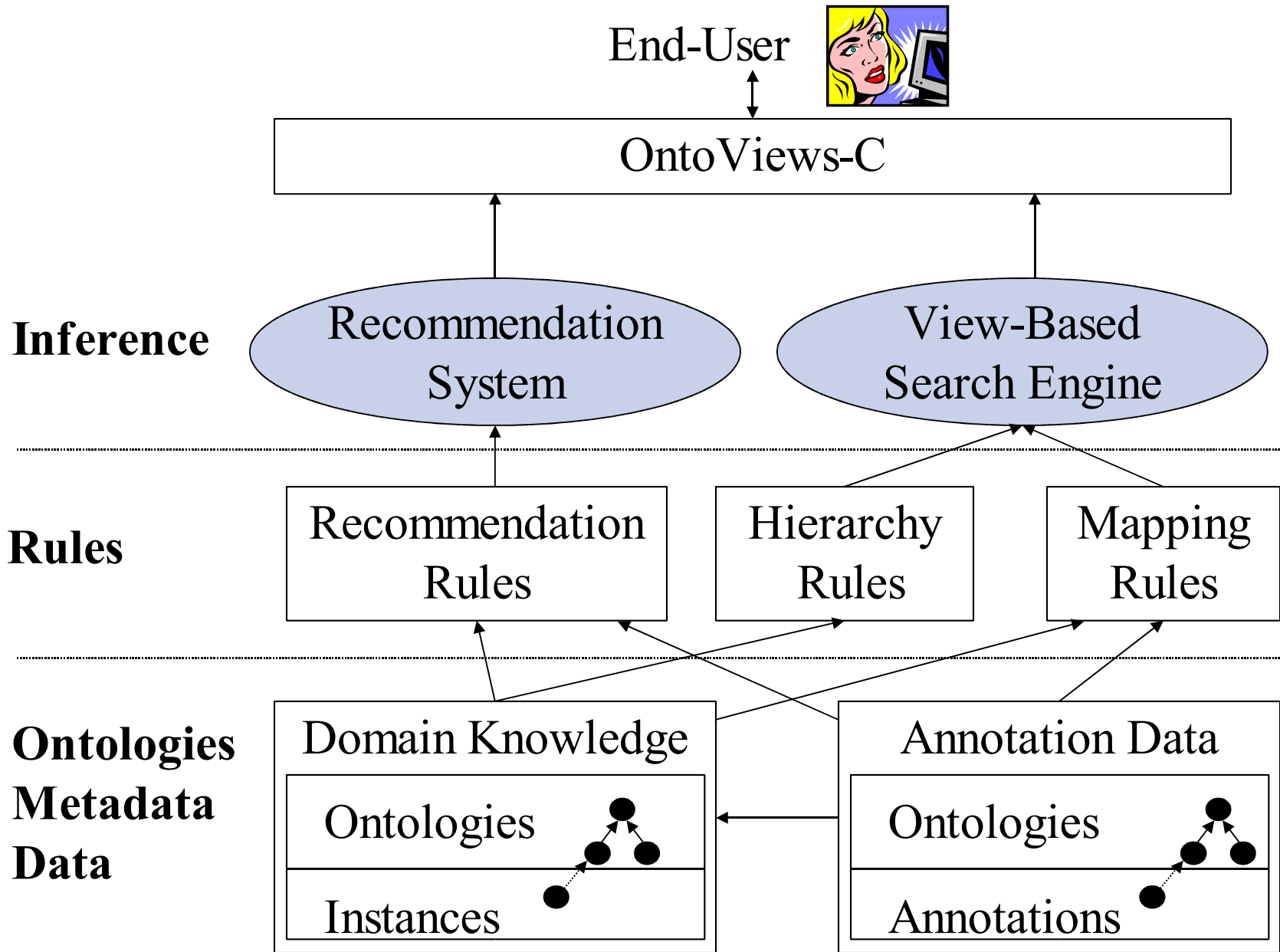
- Time:** A section with a search bar and a list of results.
- The content:** A section with a search bar and a list of results.
- Metadata of the link:** A section with a search bar and a list of results, highlighted by a red arrow.
- Aggregated recommendations:** A section with a search bar and a list of results, highlighted by a red arrow.

Annotations (search can be continued) are also present, indicated by a red arrow pointing to a search bar in the left sidebar.

Metadata of the link

Annotations
(search can be continued)

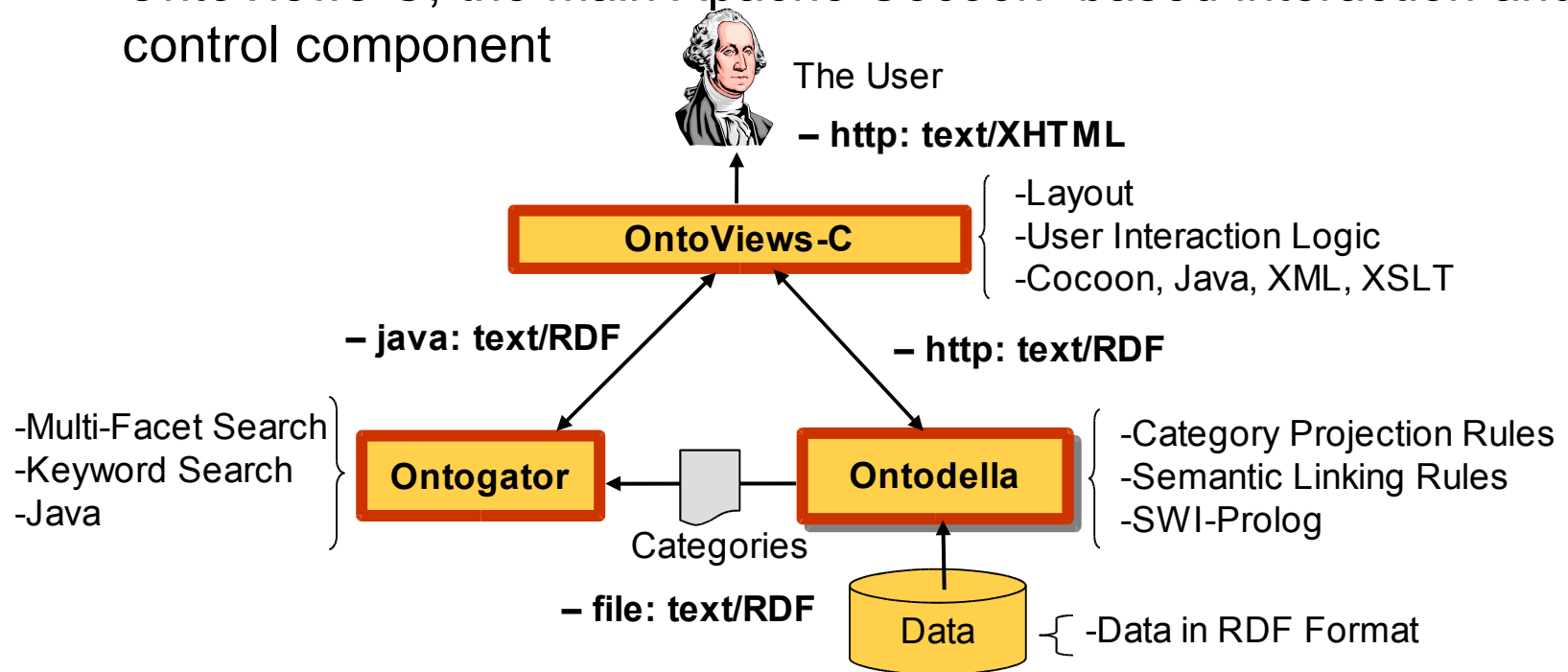
Aggregated
recommendations



The Architecture of OntoViews



- Comprised of three main components:
 - Ontodella, a Prolog-based logic server
 - Ontogator, a java-based multi-facet search engine
 - OntoViews-C, the main Apache Cocoon -based interaction and control component



Summary



- eGovernmental portals can be improved using SW techniques
 - Semantic interoperability
 - Semantic searching
 - Aggregating content (semantic browsing)
- Application demonstration of ontology-based multifacet search & browsing
- A limitation: only part of Suomi.fi content included in the demo
 - A demonstration is available:
 - » <http://www.museosuomi.fi/suomifi>
 - Larger applications of using OntoViews
 - » MuseumFinland: <http://www.museosuomi.fi>
 - » Orava portal: <http://www.museosuomi.fi/orava>