

Web 3.0 – The Web of Data for E-Commerce

RDF, OWL, GoodRelations, and Yahoo SearchMonkey

<http://purl.org/goodrelations/>

Wiesbaden, April 29, 2009

Prof. Dr. Martin Hepp

Professur für Allgemeine BWL, insbesondere E-Business

<http://www.unibw.de/ebusiness/>

About the Speakers



Prof. Dr. Martin Hepp
*Universität der
Bundeswehr München*
mhepp@computer.org



Markus Linder
*Smart Information
Systems*
ml@smart-infosys.com

Part I: What & Why?

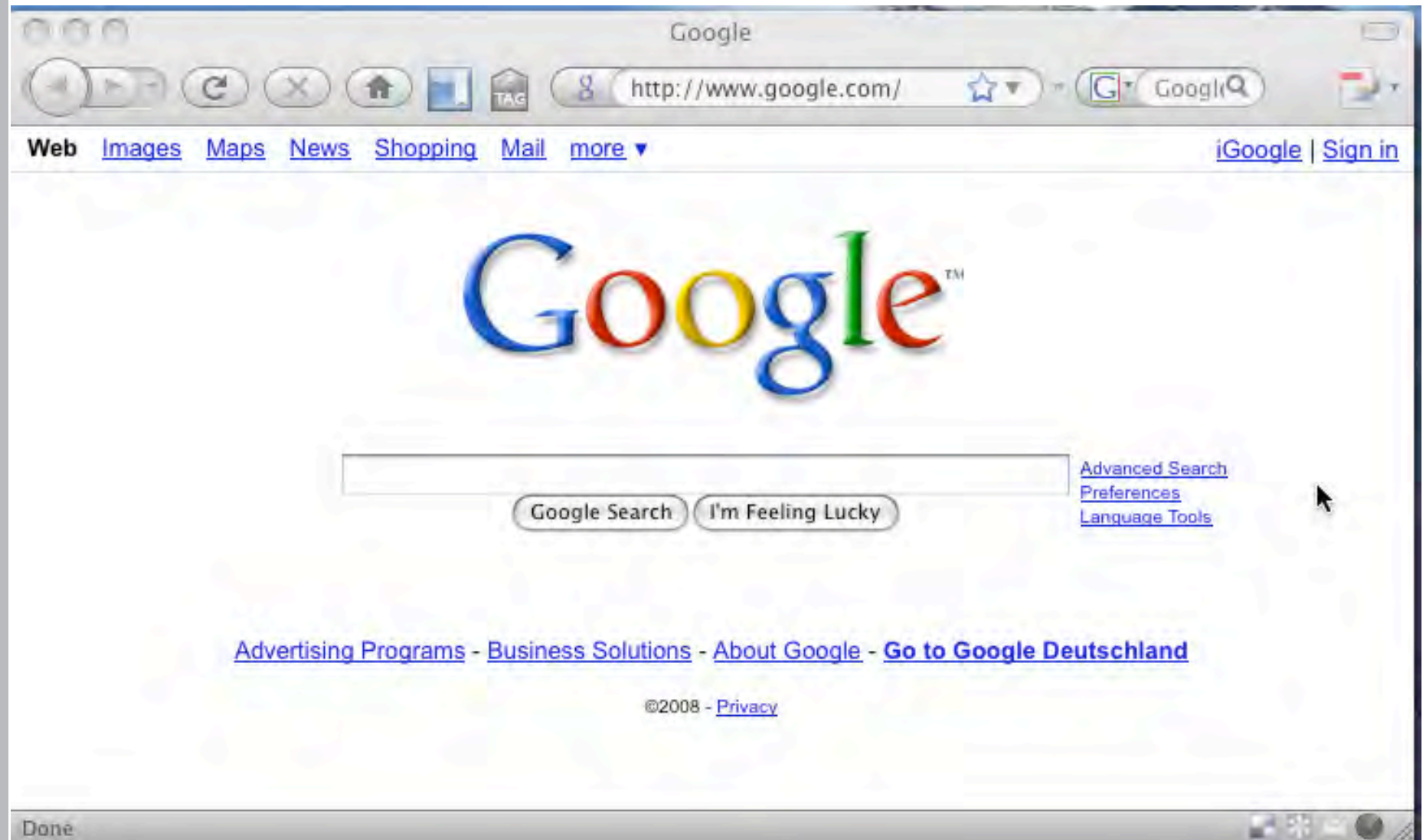
Search for Suppliers, ca. 1992



29.04.2009

Search for Suppliers, 2009

Imagine we were looking for some solar panels to be installed in Frankfurt....



E-Commerce on the Web



The Web as a Bottleneck for Product Search

- Who sells solar panels with at least 12 A output?
- Who can repair my Sony TV set?
- Who sells Volkswagen cars?
- etc.

The Web as Bottleneck for Sharing Product Data

Image you want to extract product features
from multiple Web pages...

Jaritech 6690

change language

Home Support Product Shop Catalogue Jaritech Jobs

POS Systems, Barcode Readers, Label Printers, RFID Card Technology, Touchscreens, Special Keyboards


0800-5275833

Username: Password: Login Become a member Forgot password?

CALL 0175-355 1161 +49 6081/600-200

search

CMOS Scanner for Infra Red Bar codes
Jaritech 6690



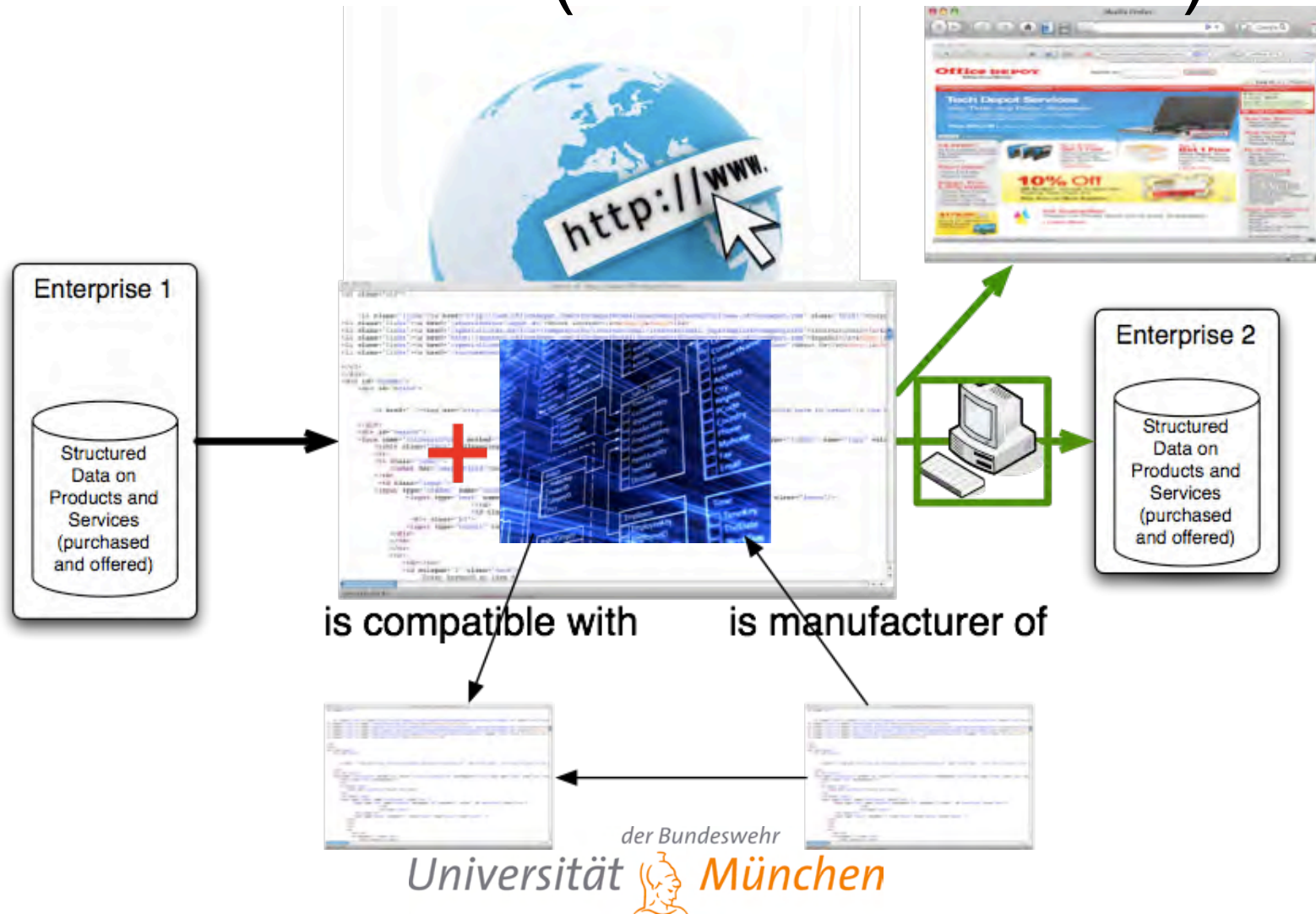
Hand-held scanner with infrared camera
Reads infrared and normal bar codes
3,000 pixel CMOS camera - faster than a laser scanner
Up to 20 cm scan range
High speed: 200 scans per second
from 199,00 € (recommended retail price)

The new scan pistol 6690IR is our first CCD handheld scanner for infrared bar codes in our product range. It is meant to scan unforgeable IR bar codes. The scanner's CMOS camera is highly aggressive and extremely fast: Pictures are scanned as a whole at stunning 200 scans per second and then internally decoded in only a fraction of a second. The high-quality CMOS camera makes the CCD scanner even faster than most laser scanners. It is this high scan performance that gives the scanner high reliability and efficiency with all bar code applications.

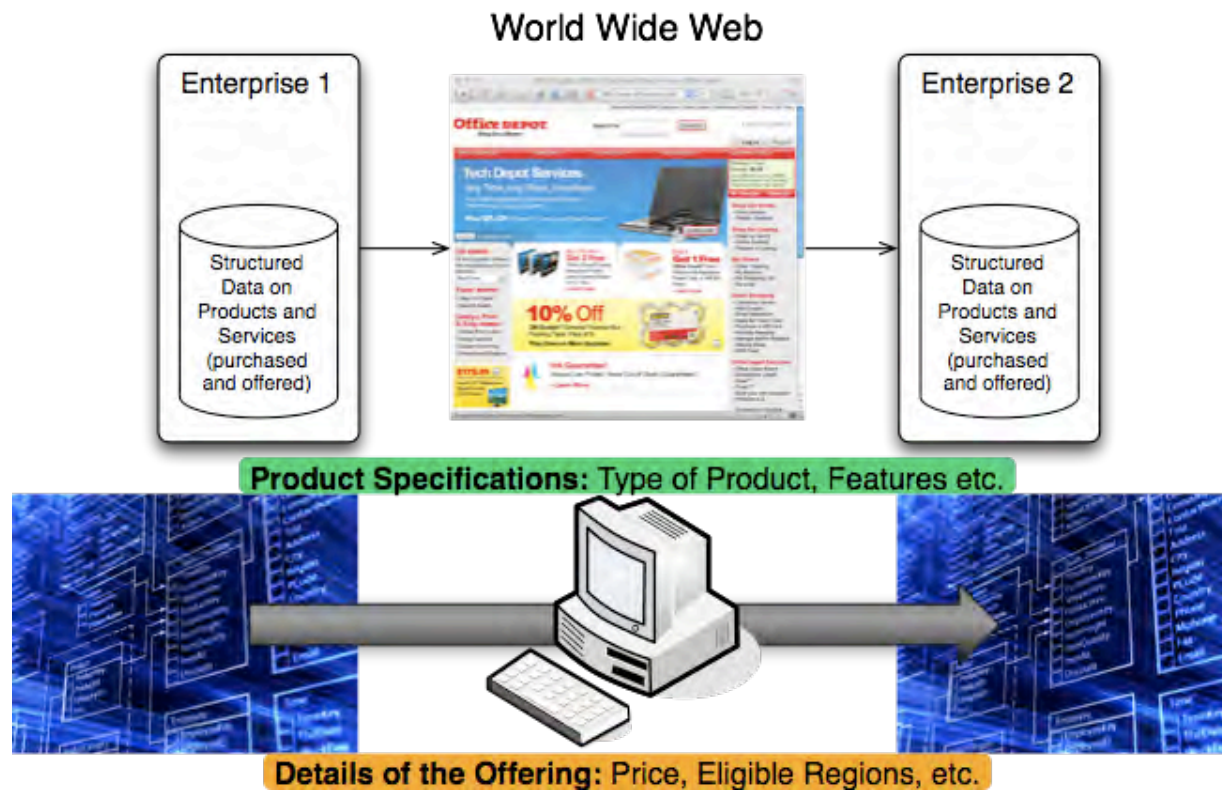
It does not matter whether it's a normal or an IR bar code, the 6690IR scans all commercial bar codes like EAN, Codebar, Code 39, 128, etc. Infrared bar codes are mainly used for security applications. They are unforgeable and can be scanned at a distance. Please check our comprehensive FAQ section for more details. They contain also a lot of useful information.

Series:
Heron G
on
2D Plus
Scan L
Scan
Scan Mobile
on
Desk
Mobile
Scan 7000
Scan 7100
Scan D8330
Scan D8530
Scan M8300

Web of Data (“Semantic Web”)

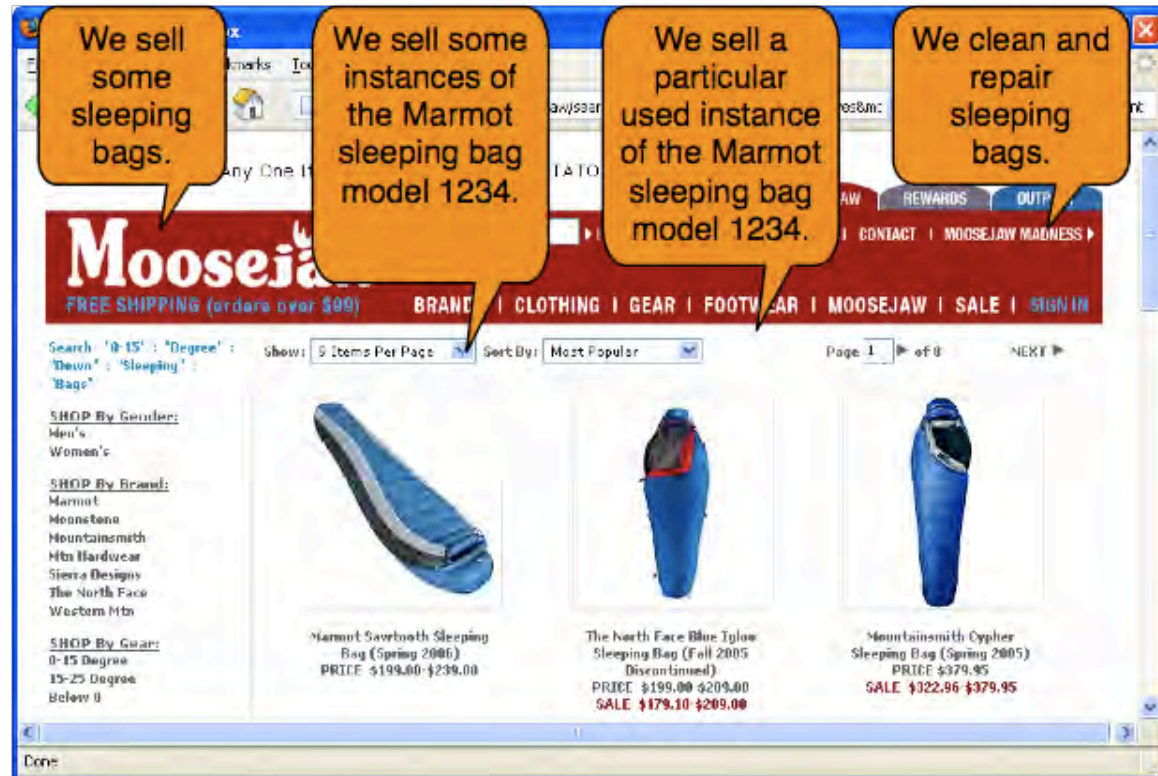


E-Commerce on the Web of Data (“Semantic Web”)



Use Cases

- Commodity offers
- Services offers
- Product model data interchange



Core Semantic Web Technology Pillars

- **URLs for everything**
- **RDF:** A data model for exchanging conceptual graphs based on triples
 - Triple: (Subject, Predicate, Object)
 - Exchange Syntax: RDF/XML, N3, etc.
- **RDFS and OWL:** Formal languages for specifying the exact meaning of vocabularies
 - `foo:human rdfs:subClassOf foo:mammal`
- **SPARQL:** Standardized query language and endpoint interface for RDF data

Required Vocabularies for E-Commerce

- An vocabulary for **product types and features**
 - by function, usage, or nature
- An vocabulary **for offer specifications**
- An offer is basically a relation between
 - an agent,
 - a set of objects,
 - a set of property rights,
 - an audience, and
 - a set of terms and conditions.



eClassOWL and GoodRelations

eClass^{OWL}

The Products and Services Ontology

- eClassOWL

foo:myTVSet instanceOf eclassowl:TVSet



- GoodRelations

foo: MillerInc goodrelations:offersToSell

foo:myTVSet

The GoodRelations Vocabulary

- A universal and **free Web vocabulary for** adding **product and offering data** to your Web pages.
- Compatible with all relevant W3C standards and recommendations
 - RDF
 - OWL



<http://purl.org/goodrelations/>

The GoodRelations Vocabulary

- **Permanent,
royalty-free access**
for commercial and
non-commercial use.



<http://purl.org/goodrelations/>

Why Should I Bother?

- **Web Shops:** Better visibility in latest generation of search engines (e.g. Yahoo)
 - Same holds for any business that has a Web page, from A as in Amusement Park to Z as in Zoo.
- **Manufacturers:** Allow your retailers to reuse product feature data with minimal overhead at both ends.
- **Software Developers:** Help your customers to use and generate Semantic Web data. It's easy!

What Should I Do?

- **Web Shops:** Create a GoodRelations data dump of your range of offers (rather simple)
- **Vendors of Web Shop Software:** Create GoodRelations import and export interfaces (we can help you with that)
- **Every Business:** Ask your webmaster to create at least a basic description of your range of products or services
- **Entrepreneurs:** Invent new business models based on GoodRelations data

Yahoo Enhanced SearchMonkey

The screenshot shows a Yahoo! search interface. At the top, there are navigation links: Web, Images, Video, Local, Shopping, and more. A search bar contains the text 'martin hepp' and a yellow 'Search' button. To the right of the search bar are links for 'Options' and 'Customize'. The Yahoo! logo is on the right side of the header. Below the header, the search results are displayed. The first result is titled 'Web Page of Martin Hepp, E-Business and Web Science Research Group' and includes a list of details: File Size: 9529, Opening Hours: Mo-Fri, 8:00 - 18:00, Payment Options: MasterCard, Visa, Paypal, and Delivery Options: DHL, UPS. The second result is titled 'DBLP: Martin Hepp' and provides a list of authors and a link to a database entry. The third result is titled 'martin hepp - ResearchIndex document query' and describes a search for scientific articles. The fourth result is titled 'UniBwM Professur für Allgemeine BWL, insbesondere E-Business - Martin Hepp' and lists authors and a link to a website. The search results are numbered 1 to 10 of 407,000 for 'martin hepp'.

Web | Images | Video | Local | Shopping | more ▾

[Options ▾](#) [Customize ▾](#)

YAHOO!

1 - 10 of 407,000 for martin hepp (About) - 0.10 s | SearchScan On

Web Page of Martin Hepp, E-Business and Web Science Research Group
[Main page www.heppnetz.de](#) | [GoodRelations Vocabulary](#)

- File Size: 9529
- Opening Hours: Mo-Fri, 8:00 - 18:00
- Payment Options: MasterCard, Visa, Paypal
- Delivery Options: DHL, UPS

[www.heppnetz.de](#) - [Cached](#)

DBLP: Martin Hepp
Martin Hepp, Pieter De Leenheer, Aldo de Moor, York Sure: Ontology Management, ... **Martin Hepp**, Mehmet Sayal, Sang-goo Lee, Juhnyoung Lee, Junho Shim: Data ...
[www.informatik.uni-trier.de/~ley/db/indices/a-tree/h/Hepp:Martin.html](#) - [Cached](#)

[martin hepp - ResearchIndex document query](#)
martin hepp - scientific articles matching the query: **martin hepp** ... Searching for PHRASE **martin hepp**. ... Tree Construction **Martin** Vingron, Arndt von ...
[citeseer.ist.psu.edu/cis?q=Martin+Hepp](#) - [Cached](#)

[UniBwM Professur für Allgemeine BWL, insbesondere E-Business - Martin Hepp](#)
Alistair Duke, **Martin Hepp**, Kalina Bontcheva, Marc Vilain (Eds. ... **Hepp, Martin**: Güterklassifikation als semantisches Standardisierungsproblem, ...
[www.unibw.de/ebusiness/team/martin-hepp](#) - 55k - [Cached](#)

Yahoo Enhanced SearchMonkey

Web Page of **Martin Hepp**, E-Business and Web Science Research Group

Main page www.heppnetz.de | [GoodRelations Vocabulary](#)

- File Size: 9529
- Opening Hours: Mo-Fri, 8:00 - 18:00
- Payment Options: MasterCard, Visa, Paypal
- Delivery Options: DHL, UPS

 www.heppnetz.de - [Cached](#)

Part I: How?

Methodology & Tools

Step-by-Step (1)

- **Data Sources**

- Form-based data entry
- RDBMS
- XML, e.g. BMEcat
- CSV
- Google CSV, RSS 1.0, RSS 2.0

- **Amount of Detail and Data Model**

- What shall be included?
- How shall the type of products be represented?

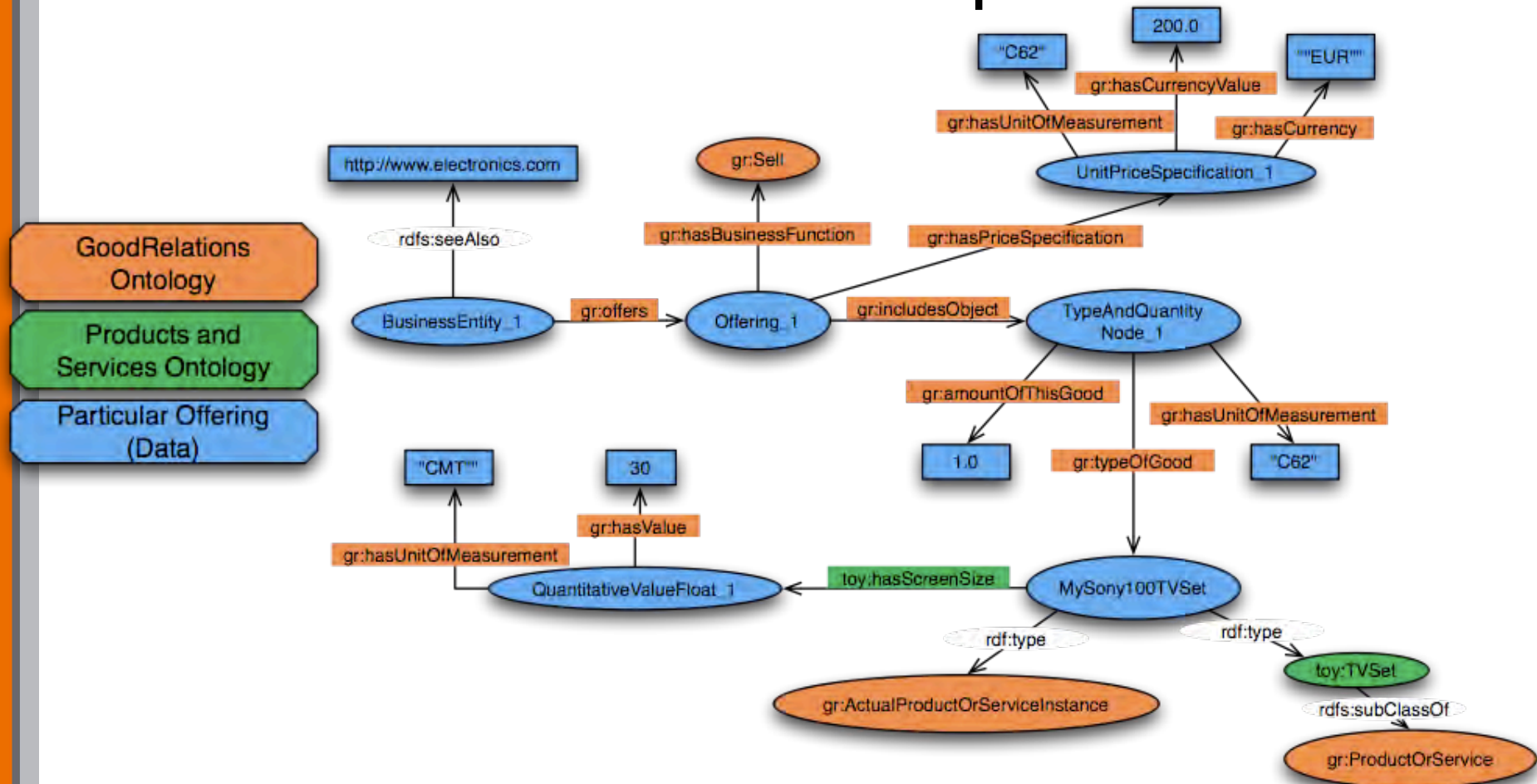
- **Data Delivery Options**

- **RDFa**: Embedding Meta-data in XHTML
- **RDF/XML**: Extra File
- **dataRSS**: Yahoo Feed Format

Step-by-Step (2)

- **Update Mechanism & Data Management**
 - PHP on demand
 - Script-based data dump
- **Publishing the Data**
 - Server Configuration
 - Notifying Semantic Web Crawlers, Yahoo,
 - Semantic Sitemaps
- **Applications**

Minimal Example



Mock-up: Augmenting ALTERNATE

The screenshot shows the ALTERNATE website interface. The main product is the Intel Core 2 Quad Processor Q9400 (FC-LGA4, "Yorkfield"). The price is € 217,90*. The page includes a navigation menu on the left, a product description, and a list of related products. The URL in the browser is http://www.alternate.de/html/product/CPU_Socket_775_Core_2_Quad/Intel(R)_Core_und_trade_2_Quad_Prozessor_Q9400/2065227.rdfs:seeAlso.

Intel® Core™ 2 Quad Prozessor Q9400 (FC-LGA4, "Yorkfield")

Art.-Nr.: **HPH15A** Offering rdf:ID

€ 217,90*

hasCurrencyValue
oder 8 Monate ab € 37,71* pro Monat

Durchschnittliche Produktbewertung (bei 6 Bewertungen):
★★★★ » Produkt bewerten » alle Bewertungen ansehen

Abb. kann vom Original abweichen.
» größere Bilder anzeigen

Ausführliche Details: Zubehör Bewertungen Preisentwicklung

Der Core™ 2 Quad Prozessor® Q9400 "Yorkfield" von Intel® ist das Quad-Core Modell der überarbeiteten und auf 45nm geschrumpften Core™ 2 Mikroarchitektur (Penryn). Die 45nm Technik sorgt zusammen mit dem Ersatz von Siliziumdioxid durch ein neues High-K-Dielektrikum für höhere Taktfrequenzen und reduzierte Verlustleistung. Die CPU® verfügt außerdem über zusätzliche Multimedia-Befehle (SSE 4.1) und 6 MB® L2 Cache, was sich durch einen deutlichen Leistungsschub gegenüber dem Vorgänger bemerkbar macht.

Tags (Schlagworte)

Andere Kunden haben folgende Tags verwendet:
core 2 quad
» Anstößiges Tag melden

» Eigene Tags vergeben » Tag-Suche » Beliebte Tags anzeigen

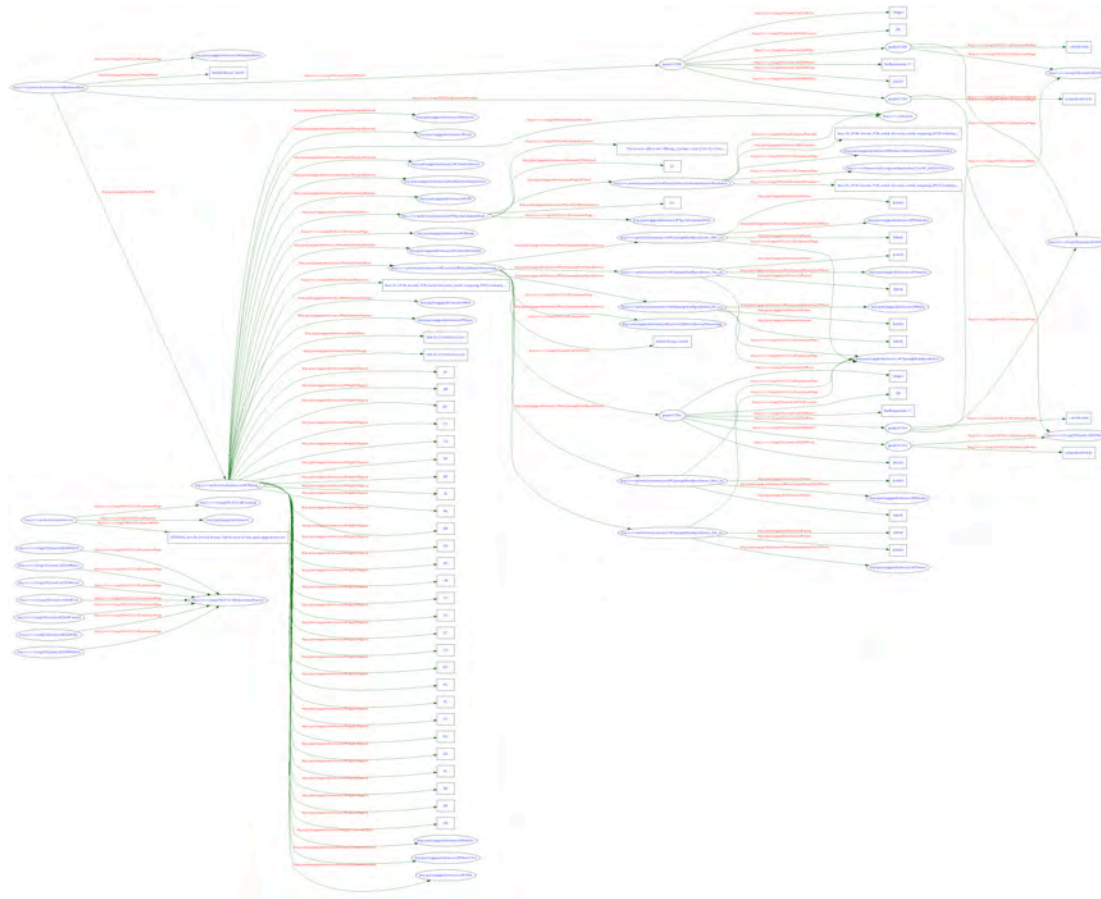
Kunden, die dieses Produkt gekauft haben, haben auch folgende Produkte gekauft:

- Mainboards Socket 775
Asus P5Q PRO
€ 117,90*
- Mainboards Socket 775
Asus P5Q
€ 109,90*
- CPU Lüfter
Arctic-Cooling Freezer 7 Pro
€ 17,99*

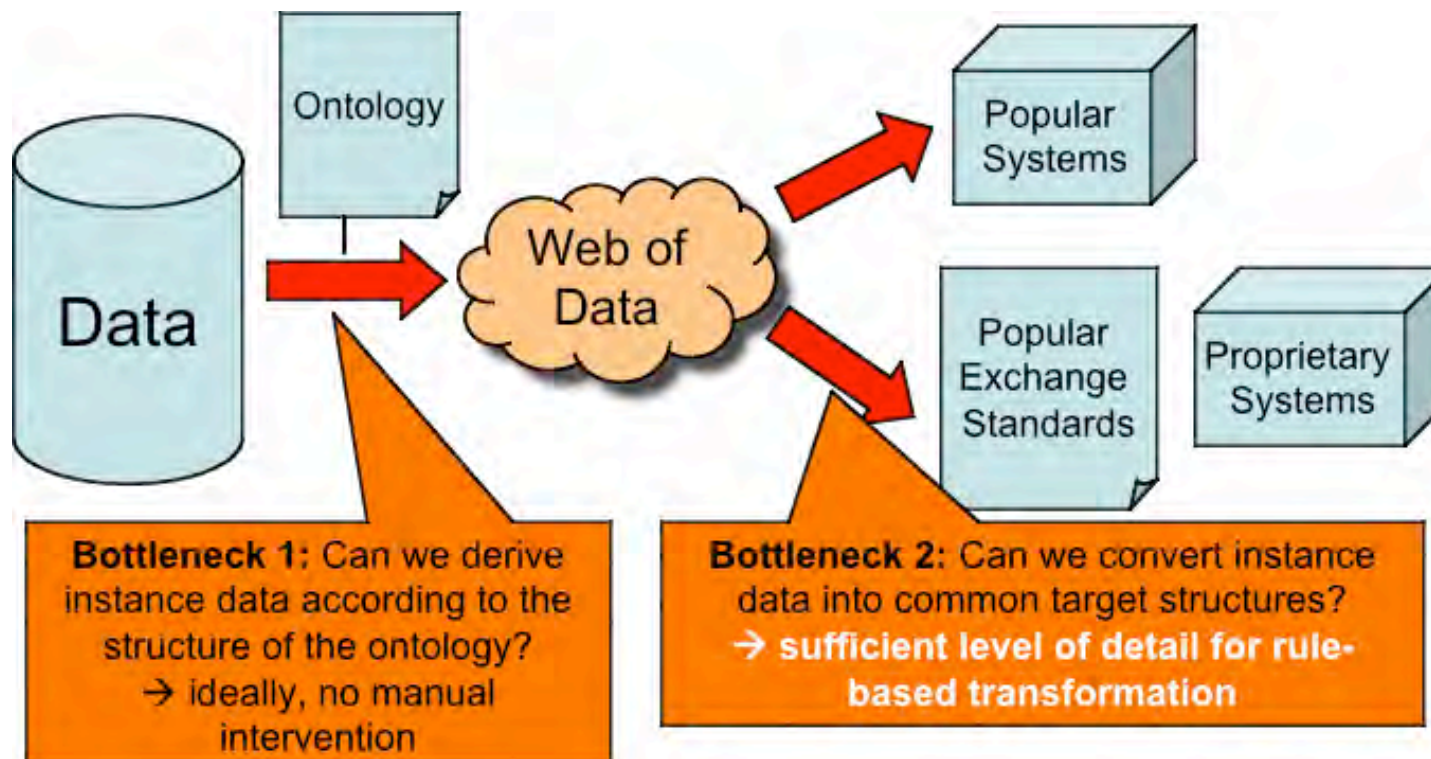
Weitere Top-Highlights

- Scanner
CT-20000N Pro
€ 2.799,-**
- Sound
Inspire T6100
€ 61,90*
- Barebones
5X20P2 Pro
€ 449,-*
- Topseller**
- CPU Socket AM2+
Phenom II X4 940
€ 188,90*
- CPU Socket AM2+
Athlon X2 7750
€ 56,90*
- CPU Socket 1366
Core™ i7-920 Prozessor

Realistic Graph




Data, Standards, Ontologies



GoodRelations Annotator

GoodRelations Annotator



GoodRelations Annotator: Describe your business on the Web of Data

With this on-line service, you can create a machine-readable description of your business and your range of products using the [GoodRelations vocabulary for e-commerce](#). Such meta-data will be considered by leading-edge search engines and recommender systems.

Step 1: Describe your business

Step 1a: Describe your company

URI of the main Web page: mandatory

Legal name of your business: mandatory

Street Address: mandatory

Post code: mandatory

City: mandatory

Country:

Phone Number: mandatory

Sales e-mail:

Technical contact e-mail: mandatory **Important:** This will not be included in the public dataset but is useful for us to contact you in case of problems with your description.

Step 1b: Describe your shop or point of sale

☐ The contact details of our point of sale are the same as above.

Name of your branch or office: (Example: Miller Electronics NYC)

Street Address: (Example: 1234 GoodRelations Avenue)

Post code: (Example: A-6020)

City: (Example: Innsbruck)

Country:

Phone Number: (Example: +43-512-507-6365) **include international phone prefix!**

GoodRelations Validator



GoodRelations Validator

Validate by URI

Validate by File Upload

Validate by Direct Input

Validate by URI

Validate a document online:

Address:

Check

Developers: Martin Hepp, Andreas Radinger, and Andreas Wechselberger

Disclaimer: This service is provided by the [E-Business and Web Science Research Group](#) at Bundeswehr University Munich as it is with no explicit or implicit guarantees.

Contact: Prof. Dr. Martin Hepp, Professur für ABWL, insbesondere E-Business, Universität der Bundeswehr München, Werner-Heisenberg-Weg 39, D-85579 Neubiberg, Germany, Phone +49-89-6004-4217, E-mail: validator@ebusiness-unibw.org, <http://www.unibw.de/ebusiness/>.

This work has been funded by the Österreichische Forschungsförderungsgesellschaft GmbH (FFG) and the Austrian Bundesministerium für Verkehr, Innovation und Technologie (BMVIT) under the [myOntology project](#) in the FIT-IT "Semantic Systems" program (contract number 812515).



29.04.2009

RDF2dataRSS Tool



GoodRelations RDF2dataRSS Converter

Convert by URI

Convert by File Upload

Convert by Direct Input

Convert RDF to dataRSS by URI

Convert an online rdf-document:

Address:

Convert

Developers: Thomas Irmischer, Andreas Wechselberger, and Martin Hepp

Disclaimer: This service is provided by the E-Business and Web Science Research Group at Bundeswehr University Munich as it is with no explicit or implicit guarantees.

Contact: Prof. Dr. Martin Hepp, Professur für ABWL, insbesondere E-Business, Universität der Bundeswehr München, Werner-Heisenberg-Weg 39, D-85579 Neubiberg, Germany,

Phone +49-89-6004-4217, E-mail: annotator@ebusiness-unibw.org, <http://www.unibw.de/ebusiness/>.

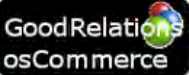
Joomla/VirtueMart Extension

The screenshot displays the Joomla! website interface, which has been extended with the VirtueMart e-commerce module. The layout includes a top navigation bar with the Joomla! logo and a search bar. The main content area is divided into several sections:

- Home:** A welcome message stating, "We have the best tools for do-it-yourselfers. Check us out!" and a paragraph about the store's history, established in 1969, dedicated to bringing the experience of authentic tools to collectors and master mechanics.
- MAIN MENU:** A list of links including Home, Joomla! Overview, Joomla! License, More about Joomla!, FAQ, The News, Web Links, and News Feeds.
- RESOURCES:** A list of links including Joomla! Home, Joomla! Forums, Joomla! Documentation, Joomla! Community, Joomla! Magazine, OSM Home, and Administrator.
- CATEGORIES:** Three categories are displayed with icons: Hand Tools (3), Power Tools (2), and Garden Tools (3).
- Featured Products:** Two products are featured: a Hand Shovel for \$5.40 and a Circular Saw for \$239.12.
- POLLS:** A poll titled "Joomla! is used for?" with options: Community Sites, Public Brand Sites, eCommerce, Blogs, Intranets, Photo and Media Sites, and All of the Above!.
- WHO'S ONLINE:** A section indicating "We have 1 guest online".
- Advertisement:** A section titled "Featured Links:" with links to Joomla! (described as the most popular and widely used Open Source CMS Project) and JoomlaCode (described as development and distribution made easy).

osCommerce Extension

mhepp@computer.org | [What's new?](#) | [Profile](#) | [My projects](#) | [Settings](#) | [Help](#) | [Sign out](#)

**goodrelations-for-oscommerce**
A GoodRelations ontology extension for the OS e-commerce solution osCommerce

[Project Home](#) | [Downloads](#) | [Issues](#) | [Source](#)

[Summary](#) | [Updates](#)

This project aims at improving OS Web shop and CMS software (in this particular case osCommerce) by extending them with capabilities for the Semantic Web.

The ontology GoodRelations, a standard vocabulary for e-commerce and complementing eClassOWL, is used to describe products and services offerings and their relationships to other resources in a machine-readable format.

By issuing e-commerce applications with the GoodRelations ontology, powerful tools to annotate products and services offerings on the Web can emerge. To help avoiding duplicate output of data in Web pages, the systems support besides RDF/XML dump output also RDFa, which enables to embed interchangeable formats as metadata in a set of XHTML attributes.

[Star this project](#)


Code license: [GNU General Public License v2](#)

Content license: [Creative Commons 3.0 BY](#)

Labels: [goodrelations](#), [oscommerce](#), [semanticweb](#), [e-commerce](#), [ontology](#), [RDFa](#)

Feeds: [Project feeds](#)

Project owners: [How to join?](#)
[i...@stalsoft.com](#)

©2009 Google - [Code Home](#) - [Terms of Service](#) - [Privacy Policy](#) - [Site Directory](#)
Hosted by 

Yahoo: Registering a Feed


YAHOO! Site Explorer http:// Explore URL

Site Explorer

- My Sites
- <http://www.heppnetz.de>
 - Statistics
 - Crawl Errors
 - Feeds**
 - Authentication
 - Actions
- Preferences
- Blog
- Badge
- Web Service API
- Feedback

Feeds - <http://www.heppnetz.de>

<http://www.heppnetz.de/> Web Site Feed Add Feed ?

	Feed URL (relative to site path)	Publication	Last Submitted
<input type="checkbox"/>	 /semanticweb.rss	pending	04/27/2009 12:27:08 UTC

Delete Feeds Resubmit Feeds

Part III: Trends

Data Sets & Industry Pick-up

Others Do Care: Pick-up in Industry

- Smart Information Systems
- ebSemantics
- Yahoo! SearchMonkey
- Virtuoso Sponger Catridges for Amazon, eBay, and others expected
- Major German mail order companies
- etc.

smart *information* systems



YAHOO!



SearchMonkey

Yahoo SearchMonkey and BOSS

Higuma Japanese Restaurant - Redwood City, CA 94063

Higuma Japanese Restaurant Redwood City, CA - tpt T. says Not a sushi ... Higuma makes better udon and ramen than some other Japanese restaurants I know. ...
www.yelp.com/biz/higuma-japanese-restaurant-redwood-city • 202k • [Cached](#)

BEFORE

Higuma Japanese Restaurant - Redwood City, CA 94063



[Reviews](#)

[Photos](#)

[Send to a friend](#)

[Send to Phone](#)

Ratings: ★★★★★ (9)

Address: 540 El Camino Real, Redwood City, CA

Phone: (650) 369-3240

Price Range: \$\$

❖ www.yelp.com/biz/higuma-japanese-restaurant-redwood-city - 202k - [Cached](#)

AFTER

Yahoo: Infobar Formatting

[Dr. Seuss' Horton Hears a Who - Acme Movies](#)

Collection of critics' reviews for the 2008 movie Horton Hears a Who! that have been compiled to formulate a "fresh" or "acme" rating.

 movies.acme.com/movies/horton_hears_a_who - 85k - [Cached](#)



[Reviews](#) ▼



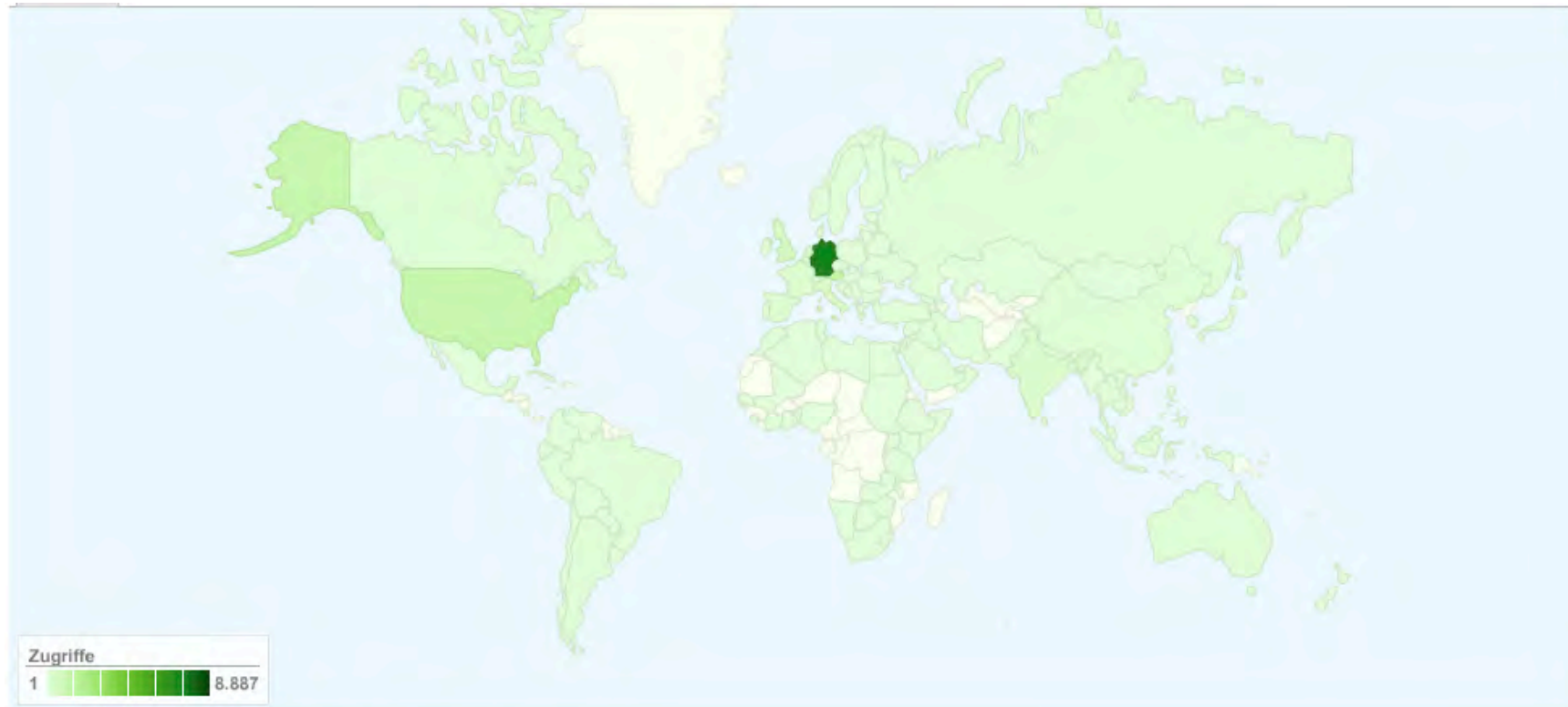
[Cast & Crew](#) ▼



[Recommendations](#) ▼



GoodRelations Page Views



18.034 Zugriffe über 131 Länder/Gebiete.

29.04.2009

Available or Upcoming Data Sets

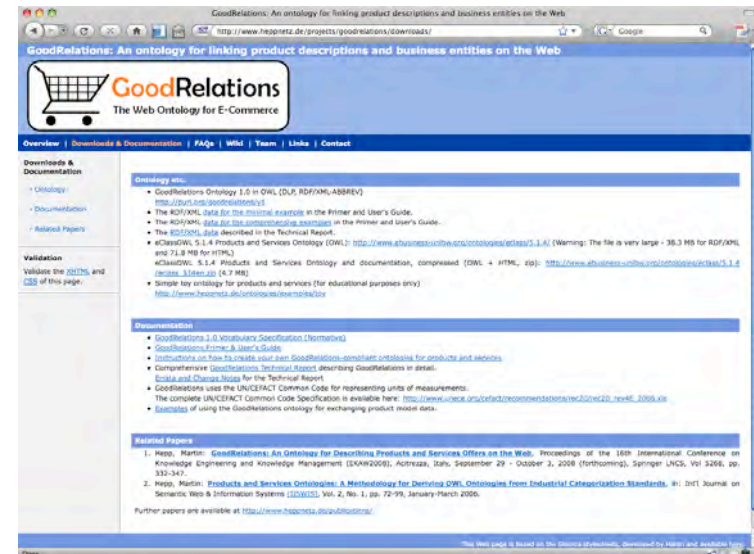
- **Product Model Data**
 - 1,572,083 products, 532,364 data-sheets, 3,389 brands
 - 1,000,000 additional commodity master data items (EAN/UPC codes, labels, suppliers)
- **Vendor and Business Location Data**
- **Large Vocabularies**
 - eClassOWL: 30 k Classes, 5 k Attributes
 - unspscOWL
 - Construction Industry (freeClass)
- **Offering Data** from Shops and Shop Software

Upcoming Software

- Intershop Enfinity Export
- BMEcat2GoodRelations Converter
- Google Shopping Converter
- RDF2dataRSS Web Service & Python Bindings

Additional Information

- Web Page
 - Ontology
 - Language Reference
 - Primer
 - Recipes
 - Wiki



<http://purl.org/goodrelations/>



Prof. Dr. Martin Hepp

Chair of General Management and E-Business
Bundeswehr University Munich

Werner-Heisenberg-Weg 39
D-85579 Neubiberg, Germany

Phone: +49 89 6004-4217

Fax: +49 89 6004-4620

<http://www.unibw.de/ebusiness/>

<http://purl.org/goodrelations/>

mhepp@computer.org

Thank you!

mhepp@computer.org

<http://www.unibw.de/ebusiness/>