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The Union of Scientists – Ruse (US – Ruse) organizes publishing of scientific and popular informative literature, and since 1998 – the "Proceedings of the Union of Scientists- Ruse".

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SEMANTIC WEB IN E-COMMERCE

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Abstract: *Semantic web technology is more and more often applied to a large spectrum of applications where domain knowledge is conceptualized and formalized (Ontology) as a support for diversified processing operated by machines.This article describes some semantic web applications in e-commerce, viewing actual trends and visionary concepts of its development.*

Keywords*: semantic web, ontology, e-commerce*

INTRODUCTION

Semantic web gives the possibility computers could understand the kinds of data it handles and how to interlink them in an intelligent manner. The conventional search engines are able to look for keywords on websites, but only humans can read and interpret product and service information on the Web. The technology used by the Semantic Web enables in innovative way intelligent applications and search engines to grasp the meaning of the information, process this data and display it so that it is comprehensible to humans.

There have to be standardized structures - ontologies, which should be easy to implement in various applications. To achieve this objective, many technology institutes are developing the collaborative wiki-based ontology development platforms. Free and easy-to-use tools must be made usable to everyone occur. An example is the event platform OpenEvent (http://www.openeventsoftware.com/index.html), it publishes events on the Semantic Web. The last step is to interlink all the data. The result of this is intelligent cross-linking among data, many diverse use cases occur. [3]

The basic pattern of the Semantic Web is the OWL (Web Ontology Language) files provided by the specific research platform, gives the possibility to create RDF (Resource Description Framework) files that contain information about a service. OWL is a family of knowledge-representing languages for ontologies. In the beginning RDF was designed as a metadata model. It is developed into a general method for the conceptual description or modelling of information, which is implemented in Web resources. Both RDF and OWL are families of the World Wide Web Consortium (W3C) specifications. [1]

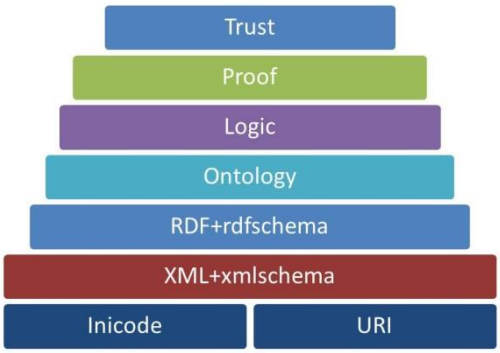

Fig. 1 – Semantic web architecture adapted with changes from Berners-Lee (http://www.w3.org/2000/Talks/1206-xml2k-tbl/slide10-0.html)

The practice has seen many Semantic Web and structured data activity. A lot of it has been driven by Linked Data, a W3C project which has gained momentum this year. According to Sir Tim Berners-Lee, Linked Data is a sea change akin to the invention of the WWW itself. We've gone from a Web of documents to a Web of data.

SEMANTIC WEB TECHNOLOGIES IN MARKETING ACTIVITIES

The use of semantic web technologies in marketing activities, especially for e-commerce, represented the greatest interest for the present analysis.

Over the past several years, the Internet provides a fast and easy way for customers to buy things without visiting an actual store. Online commerce is quickly evolving to face times of economic hardship by offering steeper discounts, flat-rate, loyalty programs, and other perks. Every online store could reach people anywhere in the world. In fact, online shopping has become so popular that many vendors sell only online with no physical location. E-commerce also facilitates the purchase of digital media such as downloadable music and movies: with no physical product, vendors can boast truly instant delivery. Many e-commerce site builders make it easy run promotions and keep the customers happy.

M. Hepp shows his view of electronic commerce examples that provide a measurable economic benefit beyond purely visionary concepts for future developments:

- Electronic commerce: profit-oriented integration and automation;
- Built-trade processes and higher flexibility through electronic market places;
- Development of integrated marketing structures with online stores;
- Rent is more friendly customer relationships through automated analysis and personalization;
- Electronic procurement: efficient purchase through integrated processes;
- XML specifications and standards for the exchange of data classification;
- Electronic public procurement;
- Supply Chain management to avoid friction losses;
- Dynamic integration with web services.[4]

Often, companies lose more money for the organization of the data's exchange between different programs than they put into implementation. Semantic-web technologies completely change their approach to integration, making it easier and more reliable than we used to. The inconsistency between different databases creates a number of inconveniences to customers. They are forced to struggle with inconsistency of data in CRM, ERP and other information systems.

The GoodRelations ontology (http://www.heppnetz.de/projects/goodrelations/) provides rich manner for describing many aspects of e-commerce, such as products and services, business, offerings, opening hours and prices. GoodRelations have seen a significant uptake from retailers such as Overstock.com, seeking to increase their visibility in search engines like as Google and Yahoo!, recognizes data, published in RDF, using certain vocabularies and use this data to enhance search results. The acceptance of the GoodRelations ontology has even extended to the publication of price lists for courses provided by The Open University. Yahoo! already works to intelligently represent GoodRelations data in search results. The conventional search engines consume structured data from the Web sites of various online stores, and use this to enhance the search listings of items from these stores.GoodRelations-encoded product descriptions perform better in the mainstream search engines than their less structured competitors.

ProductDB website demonstrates the potential of Linked Data for the area of product data integration. It links resources about products for a range of different sources and demonstrates the potential of Linked Data for the area of product data integration.

Amazon, as online retailer, also makes their product data available to third parties via a Web API. Doing these, they have created a highly successful ecosystem of affiliates who builds micro businesses, based on managing transactions to Amazon sites.

US retailer Best Buy already embeds GoodRelations RDF in product pages for consumer electronics, and reports improvements in find ability and use. UK supermarket giant Tesco already has begun to experiment with embedding RDF in pages. GoodRelations terms aren't used, but it is interesting to see how quickly that changes, and the applications that third parties might begin to build that leverage all this rich structure. Sindice is an example of a semantic Web index that crawls the Web consuming pages with structured semantic markup. E-tailers could get greater exposure in e-commerce Web portals. GoodRelations (RDF) and other product markup might also be submitted to e-commerce portals like LinkedOpenCommerce, which leverages the Web of data for e-commerce, and can be accessed by many novel apps and recommendation systems.

The Federal Economic Chamber of Austria, the **Austrian National Tourist Office**, the e-business standardization initiative AUSTRIAPRO and Smart Information Systems are working together to create the prerequisites for taking advantage of e-commerce based on the Semantic Web. The Semantic Web should be easily accessible by small and medium-sized businesses with few resources.

Future activities will include dissemination work such as attending fairs and congresses. Support and information will be provided to small and medium-sized businesses, leading to approval of and demand for the Semantic Web and improving the chances of technology uptake. [3]

STRUCTURED DATA DASHBOARD

Structured data is becoming more and more significant element of the web ecosystem. Google makes use of structured data in a number of ways, including rich snippets which allow websites to highlight specific types of content in search results. Websites participate by marking up their content using industry-standard formats and schemas.

To provide greater visibility into the structured data in the websites, there is Webmaster Tools - Structured Data Dashboard. It allows trace the use of structured elements to the site, if any. For example, the site shown on Figure 1 has about 2 000 annotations for products-catalogues (www.uchilishtezajeni.com)

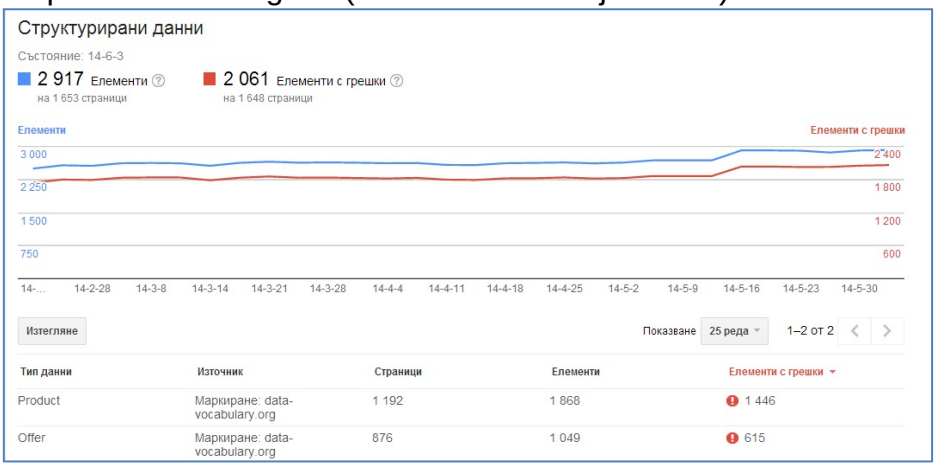

Fig. 2 - Structured Data Dashboard view - annotations

It also provides details for each item type, stores a fixed number of pages for each site and item type, and keeps their entire structured data markup. For certain item types also provide specialized preview columns. There is a details page showing all attributes of every item type on the given page.

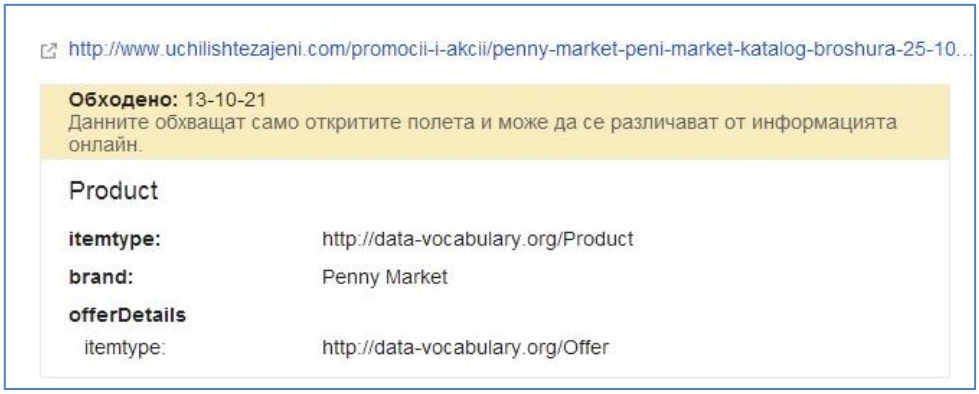

Fig. 3- Structured Data Dashboard view - attributes

CONCLUSION

The plus position of the concept of "semantic web" is obvious - it provides access to an well-structured information for any application, regardless of platform and of the programming language. The programs themselves can find the necessary resources to process information, syntheses, identify logical connections, draw conclusions, and even to make decisions based on these findings.

The main disadvantage of the concept is - the complexity of the implementation. RDF format was developed by people with an academic background and was not originally designed for use by ordinary Internet users. Many webmasters and programmers can be difficult to master RDF and OWL yet. Moreover, the very meaning of the concept has not been brought to the wider audience. Work to promote the Semantic Web is not yet at a sufficient level, not enough practical examples. There is a clear lack of utilitarian programs could facilitate the development of RDF- documents for ordinary users.

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СЕМАНТИЧНИТЕ МРЕЖИ В ЕЛЕКТРОННАТА ТЪРГОВИЯ

Десислава Баева, Свилена Маринова

Русенски университет "Ангел Кънчев"

Резюме: *Технологиите на семантичните мрежи все по-често се прилагат в широк спектър от приложения, където областите на знание са концептуализирани и формализирани (онтологии), което дава възможност за доразвиване и дообогатяване на процесите за машинна обработка на данни. Тази статия описва някои семантични уеб приложения в електронната търговия, разглежда действителните тенденции и бъдещите концепции за развитие на тези разработки.*

Ключови думи: *семантичен уеб, онтология, електронна търговия.*

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- Name of place of work - Font Size: 12, centered;
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Note: The parts in item 4 should be in Bulgarian and have to be formatted as in the beginning of the paper.

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