Smart Shop Assistant – Using Semantic Technologies to Improve Online Shopping

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Abstract. Internet commerce experiences a rising complexity: Not only more and more products become available online but also the amount of information available on a single product has been constantly increasing. Thanks to the Web 2.0 development it is, in the meantime, quite common to involve customers in the creation of product description and extraction of additional product information by offering customers feedback forms and product review sites, users' weblogs and other social web services. To face this situation, one of the main tasks in a future internet will be to aggregate, sort and evaluate this huge amount of information to aid the customers in choosing the "perfect" product for their needs.

Semantic and Web 2.0 technologies support and facilitate the integration of heterogeneous data sources, exploitation of customer feedback, and utilization of available ontologies and vocabularies, which, in turn, allow vendors to enrich existing product information, improve the user's navigation in online catalogues and enhance customers' satisfaction. In this paper we elaborate some results of *Aletheia* – a German leading innovation project for semantic federation of product information focusing on the usefulness of semantic technologies for B2C online commerce.

Keywords: smart shop assistant, semantics, customer feedback.

1 Introduction

In the future internet, which is definitely connected with the further advancement of Web 2.0 and semantic technologies, the customers' influence not only on product description but also on the entire product lifecycle is constantly increasing. Recommender systems and independent product information sites like blogs and wikis are aggregating copious amount of data which simply cannot be disregarded when offering products in an online shop. Customers will increasingly claim to have all relevant product information at their fingertips without going through long search procedures and comparing hundreds of differently product web sites.

T. Zseby, R. Savola, and M. Pistore (Eds.): FIS 2009, LNCS 6152, pp. 106–115, 2010.

In the light of such a development even big traditional and old-fashioned vendors will be forced (some of them have already been forced) to set up online shops based on modern web technologies in order to keep their competitive ability. Unfortunately, in current internet product information is still scattered across the world wide web, on manufacturer pages, in product reviews, common product web sites and in various online shops. Furthermore, current systems for managing product information and/or product lifecycle focus on the development, production, and distribution phases neglecting the preceding customer demand analysis [Baraglia and Silvestri 2007] and product portfolio management phases, as well as the subsequent operations, and maintenance phases. Since the available information having different reliability, varied trustability and various level of structure is more and more distributed across data sources all over the web and comprehensive product-related data and information accumulate in all areas of the product lifecycle, the requirements for the management of product information are undergoing a radical change [Walther et al. 2009].

To face these issues and contribute to the future internet development the German Federal Ministry of Education and Research founds a research projet *Aletheia*[1] that aims at getting obtaining comprehensive access to product information by through the use of semantic technologies. In this paper we present results of a *Aletheia*-subproject in which we utilize semantic and Web 2.0 technologies to offer a "modern" online shop connected with a new shopping experience by gathering and aggregating available information including user activities and providing intelligent assistance for the customer.

The rest of the paper is organized as follows: Section 2 gives a brief overview of the *Aletheia* project together with the introduction of the prominent project consortium. Section 3 concentrates on the particular subproject within *Aletheia* – the Smart Shop Assistant – and describes the market position of our industrial partner, the main scenario together with the main system requirements, gaols and use cases. In Section 4 we concentrate on our prototypical implementation of a semantically enhanced online shopping site going through the main user interfaces: semantic search and assistant and further technical aspects like semantic tagging. We summarize the results achieved in our subproject with a brief conclusion and aspects for the future work in Section 5.

2 The *Aletheia* Project Settings

The *Aletheia* project is a leading innovation project in the context of the ICT-Leading Innovation 2020 high tech research programm[2] of the Federal Ministry of Education and Research (BMBF), which, in turn, belongs to the High Tech Strategy and Programm "iD2010 - German information society 2010"[3]. The main goal of the project is to collect and aggregate all product-related information through the product lifecycle and the supply chain to create a meaningful knowledge base, which can be used by customers, vendors and service providers. To be able to address the above mentioned, very complex issues there was a need for a heterogenous prominent project consortium that represents

[1] `http://www.aletheia-projekt.de`
[2] `http://www.bmbf.de/de/7706.php` - German only
[3] German: "iD2010 - Informationsgesellschaft Deutschland 2010".