Web Semantics: Styling Ontology

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Abstract:

After years of research, web recommendation systems have undoubtedly become the optimal choice for the efficient operation of any e-commerce or user-friendly digital domain. Though a number of algorithms have been tested to match user expectations in order to be decision supportive, this study presents a viable framework for individual's styling suggestion. The system's goal is to increase recommendation efficiency so that it can keep up with the speed of the user's thought process and expectations while also generating only possibilities that have been validated to be closely related to the user's style hunt trend. The described method preprocesses and converts the user's past click data and searches into query words. The features are extracted from the styling ontology using query terms. This paper's ontology is largely domain specialized. External sources such as fashion reviews, e-magazines, blogs, and e-commerce fashion trends are transformed into query words and used for feature enrichment. Fashion item recommendations are made to the user based on the results of semantic similarity.

Keywords:

Semantic Web, Ontology, Styling Ontology, Protégé, OWL, Web Engineering, Web 3.O, Competency Questions, Recommender System, WebVOWL, SPARQL.

Introduction:

For most people, the World Wide Web has long been an essential source of sharing and looking for information. However, searching the web in its current form frequently yields a great number of irrelevant results while leaving some fascinating ones behind. The fundamental cause of these undesirable outcomes is that present Web resources are generally only understood by humans. As a result, we can clearly see the need to extend this network and make it into a web of data that machines can also process and analyze.

The Semantic Web, or Web 3.0, is the name given to this augmentation of the web through defined standards. By annotating online pages with information about their contents, this extended web will ensure that machines and human users have a shared communication language. Such comments will be provided in a standardized, expressive language and will make use of particular terminology. As a result, the use of ontologies is required to provide an explanation of such concepts [1]. Figure 1 shows the layers of semantic web.

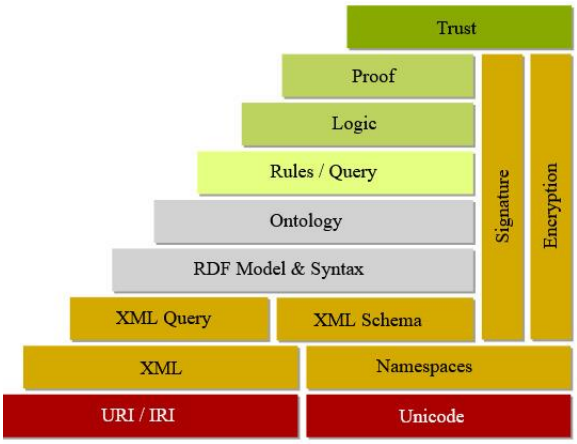

Figure 1: Semantic Web Layers

Ontologies are essential Semantic Web technologies that serve as its foundation. Ontologies explain the formal semantics of words used to explain data as well as the relationships between these concepts. They give "explicit specification of a conceptualization" (Gruber, 1993). Ontologies are becoming increasingly popular as the primary knowledge source for a variety of semantic services such as information retrieval, recommendation, question answering, and decision making.

A knowledge base is a technology that stores extensive information for use by computer systems. A machine knowledge base is equivalent to a human knowledge base. A human's decision is influenced not just by how he thinks (which is the reasoning for machines), but also by the level of knowledge he possesses (knowledge base for machines). For example, for a particular person, there is no link between the terms "Satchel" and "Wristlet." However, another person recognizes them as related because these names refer to different kinds of bags. Furthermore, a fashion enthusiast closely associates these two concepts because they are not only types of bags, but they also share the same designer. Every resultant consequence demonstrates the significance and importance of the knowledge base (degree of knowledge for humans). As a result, we may conclude that having a "good" ontology can significantly contribute to the success of various semantic services and knowledge management applications [2].

In this Paper, we are currently participating in one project that focuses on the use of Semantic Web technologies to simplify and enrich the massive management of data The key difficulty in this context is that Imperial fashion has amassed a massive dataset on all their products (mostly garments) and relevant contextual information (e.g. sale data) over the course of several years. However, for technical reasons, the many databases where the data is housed were developed without adhering to a clear, a priori, and shared model [3]. The styling ontology recommend style statement for a person according to these datasets.

Ontology Formation:

WEBPROTÉGÉ ONTOLOGY EDITOR:

We used WebProtégé, a tool for creating ontologies in the Web Ontology Language (OWL). WebProtégé is a cloud-based program that enables users to collaboratively update OWL ontologies. It may be accessed at https://webprotege.stanford.edu. WebProtégé now hosts over 68,000 OWL ontology projects and has over 50,000 registered users [4].

Styling Ontology:

We created the Styling Ontology, which provides recommendations to individuals based on their style interest. Cloths, Foot Wear, and Accessories are the three main

classes. This ontology suggests fashion for both men and women, as well as children.

In Figure 2 the classes of given ontology are mentioned.

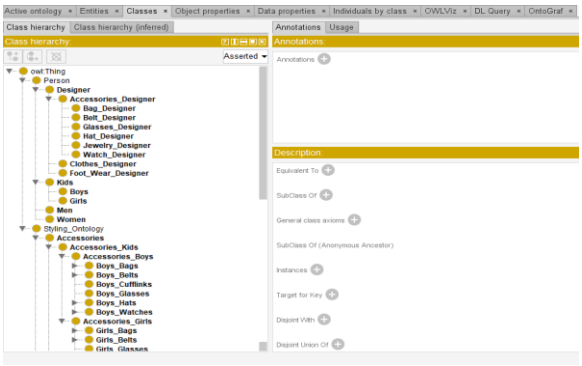

Figure 2: Classes of Styling Ontology

In Figure 3 the object properties of given ontology are mentioned.

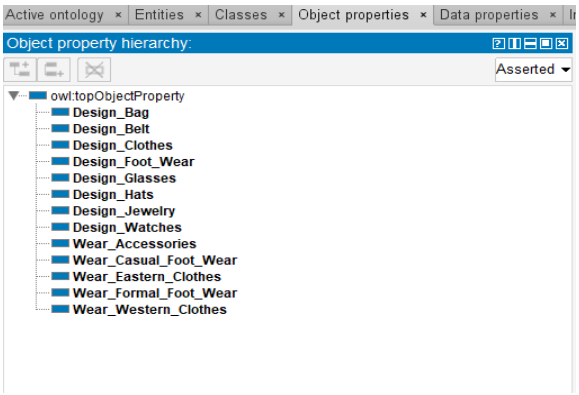

Figure 3: Object Properties of Styling Ontology

In Figure 4 the data properties of given ontology are mentioned.

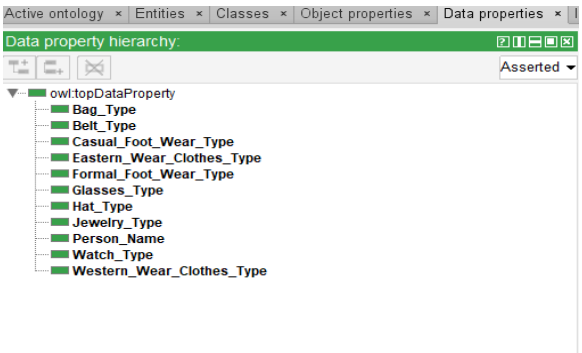

Figure 4: Data Properties of Styling Ontology

The visual representation of the ontology is given below in the Figure 5. The figure shows WebVOWL visual representation of different subclasses of three main classes.

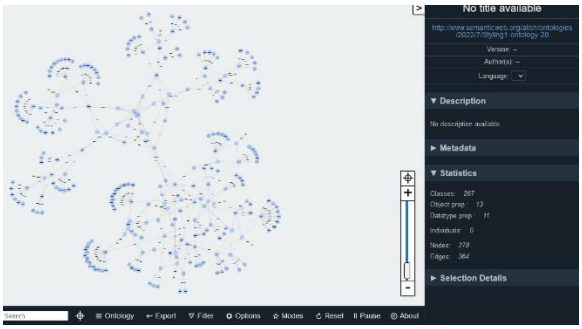

Figure 5: Styling Ontology WebVOWL visualization

Styling ORSD:

Ontology Requirements Specification refers to the activity of collecting the requirements that the ontology should fulfill (e.g., reasons to build the ontology, target group, intended uses) and possibly reach through a consensus process. The table 1 represents the Ontology Requirements Specification Document.

Styling ORSD	
1	**Purpose**
	The main goal of Styling Ontology, which provides recommendations to individuals based on their style interest.
2	**Scope**
	The ontology has to focus just on fashion domain. The level of granularity is directly related to the competency questions and term identified.
3	**Implemented Language**
	The ontology has to be implemented in OWL/XML.
4	**Intended End Users**
	Individuals of all ages.

<table>
<tr><td>5</td><td>Intended Uses</td></tr>
<tr><td></td><td>Style recommendation.</td></tr>
<tr><td>6</td><td>Ontology Requirements</td></tr>
<tr><td>a</td><td>Non-Functional Requirements</td></tr>
<tr><td></td><td>NFR1: The ontology must support an English language.
NFR2: The ontology must be based on eastern and western style.</td></tr>
<tr><td>b</td><td>Functional Requirements</td></tr>
<tr><td></td><td>
<table>
<tr><th colspan="2">Competency Questions:</th></tr>
<tr><td>Q1: Which types of bag women can have?</td><td>Q1: Which types of bag are designed by a bag designer?</td></tr>
<tr><td>Q2: Which types of watches men can have?</td><td>Q2: Which types of watches are designed by a watch designer?</td></tr>
<tr><td>Q3: Which types of formal foot wear girls can have?</td><td>Q3: Which types of formal foot wear are designed by a foot wear designer?</td></tr>
<tr><td>Q4: Which types of eastern wear boys can have?</td><td>Q4: Which types of eastern wear clothes are designed by a cloth designer?</td></tr>
<tr><td>Q5: Which types of belts women can have?</td><td>Q5: Which types of belts are designed by a belt designer?</td></tr>
</table>
</td></tr>
</table>

Table I: Styling ORSD

Conclusion:

In order to ease the problem of information overload, which has become a possible problem for many Internet users, there is a need to filter, priorities, and efficiently transmit important information on the Internet, where the quantity of choices is overwhelming. This problem is solved by recommender systems, which search through a massive amount of dynamically created information to present users with personalized content and services.

References:

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