Food Product Ontology

Initial Implementation of a Vocabulary for Describing Food Products

Maxim Kolchin and Dmitry Zamula
University ITMO (National Research University), Russia

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What’s an Ontology

A model of the world

- Introduces vocabulary relevant to domain
  - includes names of classes and relationships
- Consists of two parts
  - set of axioms describing structure of the model
  - set of facts describing some particular concrete situation
Axioms

Class: Person
Data property: fullName
Data property: age
Class: Adult
equivalent to: Person with age >= 18
Class: Child
equivalent to: Person with age < 18
Facts

Individual: Homer
  type: Adult
  age: 40
  fullName: “Homer Simpson”

Individual: Bart
  type: Child
  age: 10
  fullName: “Bart Simpson”
Use of Ontologies:
Structured data on the Web

~5.64% websites have structured data
~21% - RDFa
~6.1% - Microdata
~14.18% - Microformats

RDFa and Microformats rely on ontologies
Why do we need one more?

There are GoodRelations and several ontologies for wine, pizza and etc.

We can describe products, but we can’t add information about ingredients, energy value and etc.
Use cases

The Food Product Ontology can be used on...

A. a retailer’s web site
   • concrete instances, a brief description
B. a manufacturer’s web site
   • product specs, a detail description
C. an institution's web site
   • ingredients (E-additives etc.)
Food Product Ontology

- is an extension of GoodRelations,
- 5 main classes,
- more than 7 properties,
- more than 300 classes describing food categories (defined by the CODEX Alimentarius)
GoodRelations...

- is an ontology defining data structures for e-commerce,
- is industry-neutral, suitable for tickets, services, electronics, cars and other types of goods,
- has main classes: Business Entity, Offering, Product or Service, Location
- ...
Food categories

- Edible ices, including sherb...
- Meat and meat products, includ...
- Ready-to-eat savouries
- Cereals and cereal products...
- Dairy products and analogues,...
- Salts, spices, soups, sauces,...
- Prepared foods
- Fish and fish products, includ...
- Fruits and vegetables
- Beverages, excluding dairy...
- Foodstuffs intended for pa...
Example of a food product

<4607046575613> a food:Food ;
gr:name "Sunnyside Farms Plain Nonfat Yogurt" ;
gr:hasEAN_UCC-13 "4607046575613" ;
food:fatPer100g "0"^^xsd:double ;
food:proteinsPer100g "21"^^xsd:double ;
food:containsIngredient food:E432 .
Who sells dried fruits and on which Web pages can I get more information on respective offerings?

```
SELECT ?business ?uri WHERE {
  ?offering gr:includesObject ?TypeAndQuantityNode .
  ?TypeAndQuantityNode gr:typeOfGood ?product .
  ?product a food:Food ;
  a food:DriedFruit ;
  rdfs:seeAlso ?uri .
}
```
Who sells bread and bakery wares without E-additives?

```sql
SELECT ?business ?uri WHERE {
  ?offering gr:includesObject ?TypeAndQuantityNode .
  ?TypeAndQuantityNode gr:typeOfGood ?product .
  ?product a food:Food ;
  a food:BreadAndOrdinaryBakeryWares ;
  rdfs:seeAlso ?uri .
  ?eadditive a food:EAdditive .
  FILTER NOT EXISTS { ?product food:containsIngredient ?eadditive } }
```
Application of Ontology (1)

It’s initially built for MneMojno mobile app for representing all information about food products in RDF.

MneMojno provides a user with additional information about food products helping to select better products.
Application of Ontology (2)

- a ten-point rating,
- explanation of labels,
- laboratory results,
- and etc.
Future Work

1. An integration with a common ontology representing food in general,
2. A localization of the ontology to different languages or even make it multilingual with use of the Universal Networking Language (UNL)
Thank you!

kolchinmax@gmail.com
@kolchinmax