

Use Case

The Fusion of Search and Recommendation Functionalities

Almost any human action is based on matching concepts or better networks of concepts. For any given challenge we fire a “query” to our brain, which traverses an individual human graph and returns a subjective yet proper information or recommendation. We build with PoolParty Semantic Suite modules a recommender system for the knowledge domain “Wine and Cheese” that shall come closer to the human cognitive capabilities. The recommender system is not restricted to the food industry but can be applied to all possible domains of knowledge.

The challenge

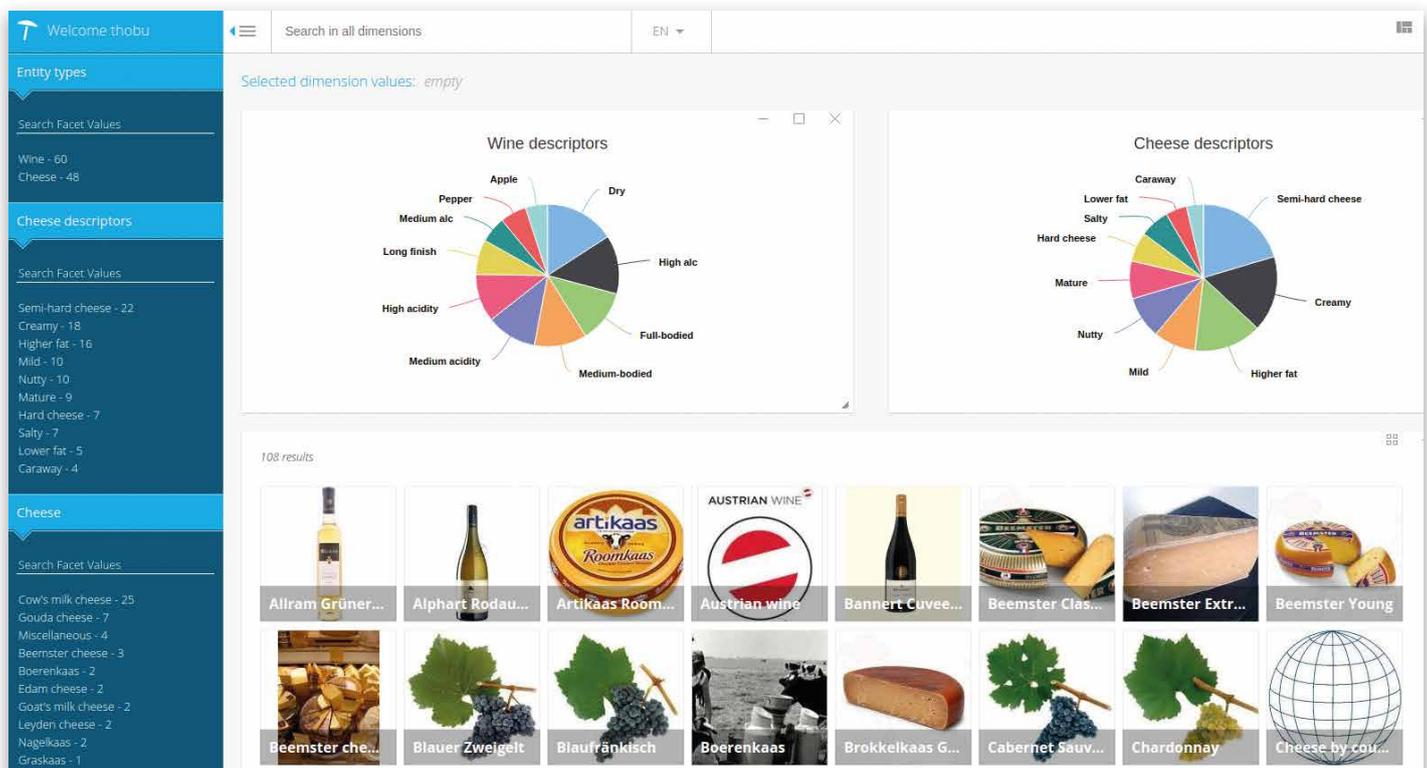
When you talk about wine qualities the most relevant question you want to answer is: “Does the wine fit my meal?” We decided to improve and extend the search and recommendation functionalities by answering the concrete question: “How does Dutch cheese and Austrian wine fit best together?” The challenge is to come up with matchings that are fuzzy enough to satisfy an array of subjective preferences.

The solution

With our experiment, we strive to deploy a knowledge graph, enriched by linked data sources that powers a neat little wine cheese pairings recommender. Elaborated SPARQL queries will be dispatched to fetch you the proper matching. A similarity algorithm finetunes the wine and cheese recommendation.

The results

Go to our application, pick your wine or cheese and find a recommendation. Based on the semantic context you will also find additional recommendations based only on the relatedness of wines and cheeses.



The screenshot displays the PoolParty GraphSearch application interface. On the left, there are navigation panels for 'Entity types' (Wine: 60, Cheese: 48) and 'Cheese descriptors' (Semi-hard cheese: 22, Creamy: 18, Higher fat: 16, Mild: 10, Nutty: 10, Mature: 9, Hard cheese: 7, Salty: 7, Lower fat: 5, Caraway: 4). The main area shows 'Selected dimension values: empty' and two pie charts: 'Wine descriptors' (Apple, Dry, High alc, Full-bodied, Medium-bodied, Medium acidity, High acidity, Long finish, Medium alc, Pepper) and 'Cheese descriptors' (Semi-hard cheese, Creamy, Higher fat, Mild, Nutty, Mature, Hard cheese, Lower fat, Salty, Caraway). Below the charts, 108 results are displayed in a grid of 12 items, including Allram Grüner..., Alphart Rodau..., Artikaas Room..., Austrian wine, Bannert Cuvee..., Beemster Clas..., Beemster Extr..., Beemster Young, Beemster che..., Blauer Zweigelt, Blauränkisch, Boerenkaas, Brokkelkaas G..., Cabernet Sauv..., Chardonnay, and Cheese by cau...

Project insights

SETUP GRAPHSEARCH

GraphSearch is a component of PoolParty Semantic Suite that builds upon a PoolParty thesaurus and an RDF triple store. It exposes a semantic search interface, results page and visual analytics. A faceted search allows for easy drill down to find your perfect match. In the user-friendly admin interface, you leverage the thesaurus, custom schemes respectively, to configure the application. You can define the facets, the object view and the range of your search, which is all based on your thesaurus.

BUILD A KNOWLEDGE GRAPH

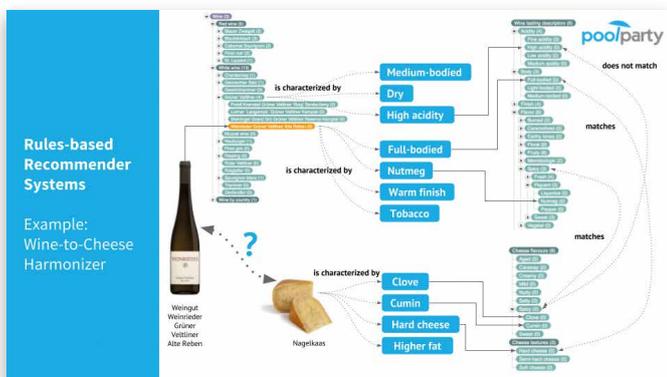
GraphSearch is based on a knowledge model that can be flexibly used for search and analytics functionalities. We built a taxonomy to model the relations between Dutch cheese and Austrian wine. The taxonomy is enriched with an ontology including custom classes, relations, and attributes. It is essential for the application to have a relation which links a cheese to a specific cheese characteristic, and a wine to a specific wine characteristic. Most relevant are custom relations between those characteristics like: does match, does not match. The matching is then modeled on this descriptor level. Since there are semantic relationships involved those are taken into account when it comes to calculating the matches.

CHOOSE A SIMILARITY ALGORITHM

With PoolParty, you can choose among a collection of similarity algorithms that fit best with your use case. Various experiments to extend the PoolParty recommender functionalities have proved that the recommendation results are strongly impacted by the actual use case and knowledge domain. A plugin in GraphSearch enables the user to configure the recommender system by choosing a suitable algorithm.

SEMANTIC DATA MANAGEMENT

In the backend of the web application, SPARQL enables the developer to translate data-related questions into queries which refer to the underlying RDF data. UnifiedViews is an integrated component of PoolParty that makes it easy to integrate or manipulate data. We created a DPU (= Data Processing Unit) that makes use of the aforementioned SPARQL queries, put them into a pipeline that does all the heavy lifting including refreshing the GraphSearch cache. You can manually trigger the pipeline or schedule it to run automatically at certain intervals. If something is changed in the knowledge graph, this is synchronized with the GraphSearch application.



Data modelling approach for wine and cheese recommendation



TAKE A LOOK

<http://vocabulary.semantic-web.at/GraphSearch/>

User: demouser

Password: poolparty

REACH OUT TO THE PROJECT TEAM

Do you want to know more? Contact us!



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Data Modelling

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