

Nutrition and Dietetics - Nutri-KG

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1. Project Domain and Goals

We aim to build a knowledge graph that recommends a healthy diet or modifications based on a user's current eating habits. The knowledge graph contains nutritional information about dishes and ingredients. Additionally, it contains information about flavor profiles, regional dishes, cost of ingredients etc. This will help us recommend minor modifications to a user's current diet within their preferred foods to maximize the chances of follow through. Using a knowledge graph for nutrition and dietetics will enable us to uncover the relationship between different dishes, ingredients and diets.

2. Datasets and Representation

The fidelity of nutritional information is of high importance for the goal of this project. We have chosen highly used and reputed sources for this purpose –

- 1) [Nutritional Value of Foods](#) – This source provides us with the different macronutrients, micronutrients, and ingredient information across all food categories. This will serve as the prime nutritional information source to compare the effectiveness of the user's dietary choices. The nutritional data for each table is stored in a tabular form.
- 2) [Additional Nutritional Data](#) – Additional metrics about effects on the body are provided here. Information such as glycemic load, completeness score, amino acid score, and fullness factor. This will enrich the existing information we have about all foods from (1).
- 3) [Flavor Knowledge Graph](#) – This source will provide us with information about the flavor profile and complimenting ingredients for each food. This will allow us to provide healthier but similar tasting alternatives. This aspect has not been implemented in similar services earlier.

Ontology: The ontology will be used from <https://dbpedia.org/ontology/Food> for most nutrition-related information. We will be augmenting this with our own ontology to expand the properties and attributes required for the scraped data.

3. Technical Challenges

Our project is essentially a recommendation system. Users will be able to input their current diet, their lifestyle goals and obtain a plan tailored to them. The challenges we anticipate are in terms of resolving conflicts in data. Apart from verifying the authenticity of sources, they may have inconsistent information which is country specific. Additionally, we will be querying large external knowledge graphs. In order to efficiently process all this data, we will have to employ caching methods. Since there is a feedback component to our recommendation system, it will require multiple users, multiple cycles of feedback to mature. The quality of recommendations can be evaluated by using multiple recommender metrics such as coverage and personalization. The metric will be finalized through the course of the project.