Abstract

Diabetes is a growing chronic health issue driven by lifestyle changes, urbanization, and poor dietary habits. Managing diabetes requires not only medical intervention but also significant lifestyle adjustments, particularly through a healthy and balanced diet. However, existing menu recom-mender systems often fail to consider the importance of a low glycemic index (GI) in meal planning, and they typically lack detailed information such as ingredients, recipes, and nutritional facts. This study seeks to address these short- comings by developing an ontology-based menu recommender system using the Ontology Web Language (OWL) to improve dietary adherence and reduce complications associated with diabetes through personalized low glycemic index menu recommendations. By modeling food data with OWL, the system organizes information about food items, glycemic index values, and nutritional properties to generate personalized recommendations. Evaluation metrics showed a precision of 0.767, recall of 1.0, accuracy of 0.767, and an F1-score of 0.869, demonstrating the system's effectiveness in recommending low-GI foods. These results indicate the system's potential in supporting diabetes management by improving dietary adherence and reducing complications.

Index Terms glycemic index, ontology, Ontology Web Language, food recommender system, recommender system