

ABSTRACT

Household food waste is a serious problem that impacts the family economy and the environment, because many leftover food ingredients are not optimally utilized and eventually become waste. This study proposes the development of a Content-Based Filtering-based recipe recommendation system reinforced with Word2Vec embedding techniques to provide recipe suggestions based on leftover food ingredients, with the aim of increasing the relevance of recommendations through the utilization of semantic representations between food ingredients. The method used includes preprocessing recipe data from public datasets, training a Word2Vec model using the Skip-Gram architecture, and fine-tuning important parameters such as vector_size, window, min_count, and epochs. Evaluation was carried out using the HitRate@k metric on 20 test scenarios each featuring the top-15 recipes with the highest similarity scores, where the test results showed that the best model (CBF + Skip-Gram) produced an average HitRate@15 of 0.276, higher than the comparison method with 0.254, resulting in an increase of 0.022 points. Relevance analysis revealed that user preferences varied; some users wanted all input ingredients to appear in the recommended recipes, while others considered only partial matches relevant. There were also cases where ingredients were not found exactly in the database and were replaced by similar ingredients, such as codfish being replaced with corn cob, sweet soy sauce being replaced with soy sauce, and local ingredients like Padang sauce not appearing at all. The developed system is able to suggest recipes that match the ingredients users have on hand, while also offering contextually relevant recipe variations, thus potentially being implemented at the household and MSME level to reduce food waste and maximize the use of available ingredients.

Keywords: Recipe Recommendations, Leftover Food Ingredients, Content-Based Filtering, Word2Vec, Leftover Ingredients