DESIGN AND IMPLEMENTATION OF A CULINARY RECOMMENDATION SYSTEM WITH PERSONALIZATION MECHANISMS

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The rapid development of information technologies and the spread of personalized services has stimulated interest in systems capable of adapting to individual user needs.

In the culinary field, recommendation systems can simplify decision-making when choosing meals by considering factors such as available ingredients, dietary restrictions, and personal taste preferences [1].

This work focuses on the development of a software system named GastroNomicon, which serves as a platform for implementing intelligent culinary recommendation mechanisms.

Within this system, various personalization methods are planned, including filtering based on dietary constraints, matching with available ingredients, and learning user preferences through feedback.

The system is designed to allow users to create personal profiles, specify dietary limitations (e.g., allergies, medical conditions, ethical considerations), and manage a virtual list of ingredients. Based on this information, the recommendation logic suggests appropriate recipes [2].

Users can also rate recipes, which enables collaborative filtering techniques to further tailor suggestions according to behavioral patterns and taste similarity with others.

The architecture of the system is being developed using a modular microservice approach, where each component is containerized with Docker for maintainability and scalability.

The backend utilizes the FastAPI framework in Python, the data is stored and managed using PostgreSQL, and the static frontend is served through the Nginx reverse proxy.

A flexible and extensible data model is being constructed to support complex relationships between users, ingredients, and dietary constraints.

This technical foundation will support future integration of AI-powered modules, such as machine learning-based recommenders or natural language interfaces.

References:
1. Trattner, C., & Elsweiler, D. (2017). Food recommender systems: Important contributions, challenges and future research directions. arXiv preprint arXiv:1711.02760.
2. Freyne, J., & Berkovsky, S. (2010). Intelligent food planning: Personalized recipe recommendation. In Proceedings of the 15th International Conference on Intelligent User Interfaces (pp. 321–324). ACM.