proceedings

Abstract

The Insights Gained during the Development of a Personalised Nutrition Mobile App †

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† Presented at the 14th European Nutrition Conference FENS 2023, Belgrade, Serbia, 14–17 November 2023.

Abstract: Tracking food intakes using a mobile app can be an effective approach for some individuals, but it is crucial to consider their personal preferences and health status before adopting this method. Personalized nutrition apps can also serve as an efficient tool for collecting, analysing, and reporting dietary data to support dietary surveys, such as EU Menu by the European Food Safety Authority (EFSA). However, developing an easy-to-use and efficient app requires several essential components. This work presents the insights gained during the development of Eatvisor, a personalized nutrition mobile app. In Slovenia, there was a lack of such tools tailored to national food choices, dietary habits, and recommendations. The app utilizes a food composition database (FCDB) developed in Slovenia; however, the database had many missing compositional data for generic and branded foods. To address this issue, an in-house database management system (DBMS) was developed to support the compilation of different types of data from various sources, such as foreign FCDBs, GS1 Global Data Synchronisation Network (GDSN), database of waste streams, and crowdsourcing, while adhering to the food standards of CEN and respecting the FAIR (Findable, Accessible, Interoperable, Reusable) principles. It is worth emphasizing that compiling a FCDB is a complex task that requires up-to-date knowledge and technical solutions to streamline and expedite the process. Specifically, the DBMS was integrated with semantic resources for organizing knowledge about food (FNS-Harmony ontology linked with FoodOn), as well as food-related regulatory issues. Additionally, methodologies were developed to support missing data imputation in a semi-automated way, and DBMS was designed to manage missing dietary recommendations in a machine-readable format. Moreover, DBMS allows collecting and linking data and knowledge required for personalized advising, including food composition data, biomarker reference intervals, and tailored dietary advice, for both domain experts and machines. Finally, this work evaluates DBMS from the perspective of the data and knowledge required for the development of a personalized nutrition mobile app, such as Eatvisor. The results suggest that DBMS can effectively support the development of a personalized nutrition app, and the methods used can serve as a framework for developing similar apps in other regions.

Keywords: food intake; food composition; database management system; personalized nutrition app

Citation: Koroušić Seljak, B.; Ogrinc, M.; Simčič, A.; Valenčič, E.; Modic, R.; Ispirova, G.; Eftimov, T. The Insights Gained during the Development of a Personalised Nutrition Mobile App. *Proceedings* **2023**, *91*, 191. https://doi.org/10.3390/proceedings2023091191

Academic Editors: Sladjana Sobajic and Philip Calder

Published: 2 February 2024

Author Contributions: Conceptualization, B.K.S., M.O., A.S., E.V., R.M., G.I. and T.E.; methodology, B.K.S. and T.E.; software, M.O., A.S. and R.M.; testing E.V.; writing—original draft preparation, B.K.S.; writing—review and editing, B.K.S., M.O., A.S., E.V., R.M., G.I. and T.E.; supervision, B.K.S. and T.E.; funding acquisition, B.K.S. and T.E. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by the OPKP ('Upgrade of the Open platform for clinical nutrition with a mobile app') project, which has received funding from the Ministry of Health of Slovenia under Grant Agreement No. C2711-19-185021, and by the Slovenian Research Agency (research core grant number P2-0098: Computer Structures and Systems).

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.