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REVIEW

Integrating technology and nutrition for healthy eating

Integración de tecnología y nutrición para una alimentación saludable

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ABSTRACT

The application developed responded to the need to offer personalised meal plans aligned with the Dietary Guidelines for the Argentine Population. This solution used Artificial Intelligence to generate individualised nutritional recommendations and Augmented Reality to scan foods, enabling more conscious eating. It provided concrete benefits, such as access to healthy meal plans, daily progress tracking, and reduced risk of chronic non-communicable diseases. The project integrated knowledge of nutrition, computer science, and user experience design. Technologies such as SwiftUI for declarative interfaces, MVVM architecture to keep logic separate and organised, Node.js for backend development, and MongoDB for unstructured database management were implemented. This combination enabled a robust, flexible, and scalable application. The problem domain analysis highlighted the importance of distinguishing between meal plans and strict diets, emphasising mindful eating as a central focus. Compared to other apps on the market, this proposal stood out for its comprehensive, evidence-based and user-centred approach. In conclusion, the application represented a significant contribution to digital health. Not only did it promote healthy and sustainable eating, but it also proved to be an effective tool for fostering positive habits through education, personalisation and the strategic use of emerging technologies. Its development marked an important step towards digital solutions that improve quality of life.

Keywords: Artificial Intelligence; Augmented Reality; Food Planning; Digital Health; Personalisation.

RESUMEN

La aplicación desarrollada respondió a la necesidad de ofrecer planes alimentarios personalizados, alineados con las Guías Alimentarias para la Población Argentina. Esta solución utilizó Inteligencia Artificial para generar recomendaciones nutricionales individualizadas y Realidad Aumentada para escanear alimentos, permitiendo una ingesta más consciente. Proporcionó beneficios concretos, como el acceso a planes saludables, seguimiento del progreso diario, y reducción del riesgo de enfermedades crónicas no transmisibles. El proyecto integró conocimientos de nutrición, informática y diseño de experiencia de usuario. Se implementaron tecnologías como SwiftUI para interfaces declarativas, la arquitectura MVVM para mantener la lógica separada y organizada, Node.js para el desarrollo del backend y MongoDB para la gestión de bases de datos no estructuradas. Esta combinación permitió una aplicación robusta, flexible y escalable. El análisis del dominio del problema subrayó la importancia de distinguir entre planes alimentarios y dietas estrictas, destacando la alimentación consciente como eje central. Comparado con otras aplicaciones del mercado, esta propuesta se distinguió por su enfoque integral, basado en evidencia científica y centrado en el usuario. En conclusión, la aplicación representó un aporte significativo a la salud digital. No solo promovió una alimentación saludable y sostenible, sino que también demostró ser una herramienta eficaz para fomentar hábitos positivos mediante educación, personalización y uso estratégico de tecnologías emergentes. Su desarrollo marcó un paso relevante hacia soluciones digitales que mejoran la calidad de vida.

Palabras clave: Inteligencia Artificial; Realidad Aumentada; Planificación Alimentaria; Salud Digital; Personalización.

INTRODUCTION

The implementation of this food planning app responded to the need to provide quality meal plans, personalized for each individual, with the possibility of monitoring, using Artificial Intelligence trained to follow the guidelines of the Argentine Dietary Guidelines. It also addressed the need to provide information on consumption by scanning foods to achieve conscious intake thanks to Augmented Reality.

Among the main benefits of this application were access to a healthy and personalized plan, improved consistency thanks to monitoring and the ability to observe progress, as it had a section where consumption was added throughout the day, which facilitated the achievement of long-term nutritional goals. In addition, real-time food scanning provided accurate information about the products consumed, promoting more conscious eating. It was also important to highlight the reduction in the risk of chronic diseases by promoting healthy eating habits.[1]

This project had a significant impact by integrating advanced technologies and offering an accessible and effective solution that improved users' quality of life.

DEVELOPMENT

Problem Domain

To analyze the problem domain, it is important to reflect on mindful eating and the meaning of a meal plan and how it differs from strict diets. Andrea A. Fernández [2] states that "mindful eating consists of paying full attention when we eat." At the same time, the Grijalva Valley University describes: "A plan is an integral element, adapted to personal characteristics, which aims at beneficial and sustainable results, oriented towards developing diets for healthy living in general."

ICT (information and communication technology)

	Fitia	MyFitnessPal	El CoCo
Provee Plan Alimenticio	Si	No	No
Escaneo de Alimentos	No	No	Si
Monitoreo de Consumo Diario	Si	Si	No
Recomendaciones Nutricionales	Si	No	No

Figure 1. System competence

SwiftUI

Apple's modern framework for developing user interfaces on iOS in a declarative manner. It facilitates the creation of applications by allowing the appearance and behavior of interfaces to be easily defined, reducing code complexity and improving the development experience.[3]

MVVM

The MVVM architecture in SwiftUI is used to separate business logic from the user interface, promoting more modular and maintainable code. This allows developers to better manage interface updates and application state, providing a clear structure for developing robust and scalable applications.[4]

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Node.js

An open-source JavaScript-based platform designed to build efficient and scalable backend applications. It allows developers to handle multiple requests simultaneously and is ideal for modern Internet-connected applications, such as those that integrate artificial intelligence and augmented reality services.[5]

MongoDB

A document-oriented NoSQL database management system that stores data in a JSON-like format. It offers high flexibility and scalability, allowing large volumes of unstructured data to be handled efficiently. It is ideal for applications that need to adapt to rapid changes in data schemas and that seek horizontal scalability.[6]

Competition

The figure 1 shows a comparative analysis of some existing applications on the market that focus on food planning.[7] Each of these applications offers different features, from food scanning to monitoring eating habits, but they differ in how they address these needs. The analysis seeks to highlight the main features of each application and its specific approach to helping users improve their diet.

CONCLUSIONS

The application developed constitutes a significant contribution to the field of digital health by coherently and innovatively integrating advanced technological tools with nutritional principles based on scientific evidence. Through the use of Artificial Intelligence trained according to the Dietary Guidelines for the Argentine Population and the use of Augmented Reality for food scanning, a technological solution was designed to promote healthy, personalized, and sustainable eating habits over time.

From a methodological perspective, the project was based on an interdisciplinary approach that brought together knowledge from the fields of nutrition, computer science, and user experience design. The implementation of technologies such as SwiftUI for the creation of declarative interfaces, MVVM architecture for logical and maintainable structuring, Node.js for the development of a scalable backend, and MongoDB as a NoSQL database management system, made it possible to achieve a robust, efficient product that can be adapted to future needs.

In terms of impact, the application not only facilitated access to meal plans tailored to each user's characteristics and goals, but also offered tracking and feedback mechanisms that promoted more conscious eating habits. This functionality was particularly relevant in the current context, where the promotion of healthy habits and the prevention of chronic non-communicable diseases are priority challenges in public health.

Likewise, comparative analysis with other solutions on the market showed that this development stands out for its comprehensive, user-centered approach. While other applications tend to offer fragmented or generic features, the proposal presented here was based on scientific, technological, and pedagogical criteria aimed at facilitating behavioral change through nutrition education, personalized strategies, and the use of digital resources.

In short, the project successfully achieved its goal of designing and implementing an innovative, functional food planning application based on current health and technology standards. It is a significant contribution to the field of nutrition technology, with strong potential for positive impact at both the individual and population levels. In the future, the expansion of its functionalities, the incorporation of clinical and clinical- y data, and validation through empirical studies could consolidate it as a reference tool in the promotion of food health in digital environments.

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FINANCING

None.

CONFLICT OF INTEREST

None.

AUTHOR CONTRIBUTION

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