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Bilgi Üniversitesi

NutroPlan(Nutritionist Management System)

by

Alp Yildirim, 119200046
Hasan Huseyin Kalay, 120200077
Murat Can Onder, 119200089

Supervised by

Murat Orhun

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Abstract

This paper introduces Nutroplan, a Windows-based management system representing a breakthrough in the field of nutrition management. Primarily designed to support the professional practices of dietitians, the application includes fundamental modules such as user management, appointment scheduling, customer profiles, diet programs, and reporting and analysis. User management allows dietitians to efficiently handle client information and organize appointment schedules. The customer profile module enables the creation of comprehensive profiles, incorporating individuals' health histories, goals, and preferences. The diet programs module empowers dietitians to tailor nutrition strategies specific to each client. With reporting and analysis features, Nutroplan provides detailed reports on dietary habits, offering guidance for achieving healthy lifestyle objectives. This report provides a detailed examination of Nutroplan's development process, key features, and potential future enhancements. Nutroplan has the potential to set a new standard in nutrition management by significantly contributing to the professional practices of dietitians.

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List of Abbreviations

i.e.	Id est (Latin: this means)
e.g.	Exempli gratia (Latin: for example)
SQL	Structured Query Language
ERP	Enterprise Resource Planning
AI	Artificial Intelligence
MIT	Massachusetts Institute of Technology
TDA	Turkish Dietitians Association

1 Introduction

Healthy nutrition stands as one of the most crucial aspects for preserving both health and maintaining an optimal body composition. From the initial stages beginning with breastfeeding or formula feeding for infants, throughout adulthood, and into old age, meeting the requirements for healthy and balanced nutrition across all age groups is of paramount importance. This ensures protection against diseases and striving for an ideal body mass. Fulfilling all essential nutrients adequately is imperative for the seamless execution of daily bodily functions.[1]Hence, maintaining a healthy and balanced diet is indispensable for achieving this goal. Nutritionists play a vital role in guiding individuals on how to develop a nutritious lifestyle and achieve their desired health goals, whether it is losing excess weight or managing high blood pressure. Nutritionists' responsibilities go beyond creating personalized meal plans. They must carefully evaluate their patients' health information and goals and schedule appointments that require dedication and meticulousness. However, fulfilling the specified duties and establishing good communication with patients requires more effort than expected from nutritionists. [2] In this context, the importance of using a management system becomes evident. Turkish Dietitians Association (TDA)There are approximately 40,000 dietitians, half of whom are independent practitioners. This translates to approximately 12,500 dietitian offices nationwide. Currently, only 20% of these offices use management systems, but predictions show that this proportion will increase to 25% by 2024.[3] These data highlight a significant gap in the adoption of efficient management systems within the dietitian community. The clear need for a comprehensive Nutrition Management System is highlighted by the expected growth in the percentage of dietitian offices using such systems in the coming years.

In this project, we aimed to develop the Nutroplan nutrition management system. Nutroplan is a Windows-based ERP system designed specifically to support the professional practices of dietitians. Our goal is to assist healthcare professionals in optimizing their nutrition counseling processes by providing essential features such as customer management, appointment scheduling, customer profile creation, designing diet programs, and generating reports and analyses. Nutroplan is crafted to enable dietitians, to systematically track their patients' health data, and create personalized nutrition plans. The project's objective is to streamline the work of nutrition consultants and contribute to supporting individuals in adopting healthy eating habits.

2 Related Works

In the expansive landscape of nutrition management platforms, a diverse array of commercial solutions and research projects have made significant strides. Examining both commercial platforms and cutting-edge research initiatives provides valuable insights for the development and enhancement of Nutroplan. Commercial platforms such as MyFitnessPal[4], Lose It![5], and Crono-meter[6] offer comprehensive tools for calorie tracking and nutrition analysis. However, their limitations become apparent when considering the specific needs of dietitians and the creation of personalized nutrition plans. MyFitnessPal and Lose It! concentrate on individual users' calorie counting and weight management, lacking advanced features tailored for professional use. While Cronometer provides detailed nutrient analysis and recipe support, its interface may not be the most conducive for dietitians seeking a professional-grade tool. In contrast, Nutrium, a platform explicitly designed for dietitians, introduces features like meal planning, progress tracking, and appointment scheduling. Despite its focus on general nutrition guidance, Nutrium could benefit from further customization to address specific medical conditions and enhance its professional utility.

Research projects like DietBuddy[7], developed by the University of California, San Diego, harness AI for personalized recommendations and coaching support Nutroplan may explore similar AI-powered features to increase user engagement. MIT's FoodLens project[8], utilizing image recognition for real-time food intake analysis, represents an innovative approach. mDietPlan, a web-based system from the University of Pittsburgh, focuses on managing diabetes through personalized diet plans and educational resources. Adapting elements from mDietPlan could empower Nutroplan to cater more effectively to specific dietary needs and medical conditions, reinforcing its position as a comprehensive and tailored solution for both dietitians and users alike.

Existing nutrition management platforms and software support clinicians in their professional practices by providing crucial functionality such as managing patients' health information and goals, creating personalized nutrition plans, monitoring and evaluating diet progress, responding to diet-related questions, and enhancing diet motivation. Nutroplan differentiates itself from these platforms and software by offering uniquely tailored features for dietitians. For instance, it provides a specialized tool allowing dietitians to manage patients' health information and goals in one centralized location. Additionally, it aims to utilize an artificial intelligence-supported tool to create personalized nutrition plans for patients and provides charts and graphs to track and assess diet progress. Furthermore, it includes a knowledge base for quick and accurate responses to diet-related questions. Nutroplan places a

strong emphasis on data security and privacy, introducing an additional layer to ensure a secure environment for both dietitians and patients. With these features, Nutroplan aims to deliver a more effective, efficient, and secure nutrition management experience for dietitians.

3 Design

The design of Nutroplan, our nutrition management system, is meticulously crafted to offer an intuitive and efficient experience for dietitians in their professional practices. The user interface is thoughtfully designed to be user-friendly, ensuring easy navigation through the platform's diverse features.

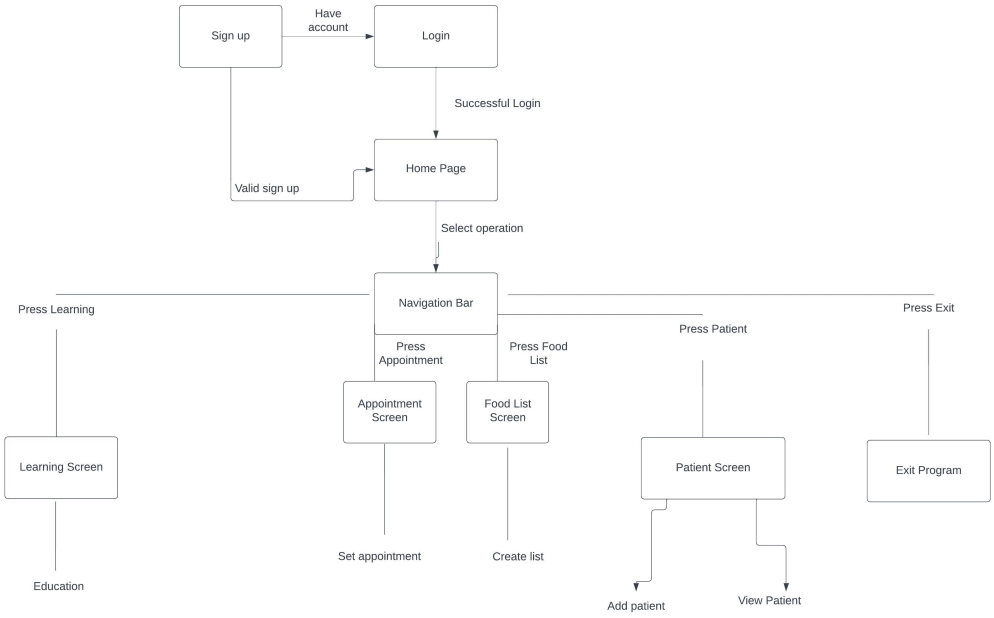

Figure 1: App Overview Diagram

App opens up with a login screen.User can login or sign up.The design also incorporates informative error messages to guide users effectively.After user login, they will greeted with home page.When user select operation which they want to use they decide on navigation bar.Navigation bar has buttons for their respective screen.Learning button,Appointment button,Food List button, Patient button,Exit button.Learning Screen has several videos or hints about nutrition dietetics.Appointment Screen create appointment and check if that time is available or not.Food List generate list for diet and view them.Patient Screen user can write their specific informations about their client and save them not only this but also they can see them. Nutroplan's Exit Program feature is designed with user security in mind. Clear prompts ensure users save any unsaved data, and log-out processes are streamlined. The design prioritizes user awareness and data integrity during the exit process.In summary,

Nutroplan's user interface design focuses on creating a seamless and intuitive experience for dietitians. The thoughtful design elements across these key screens aim to enhance usability, efficiency, and overall user satisfaction within the nutrition management platform.

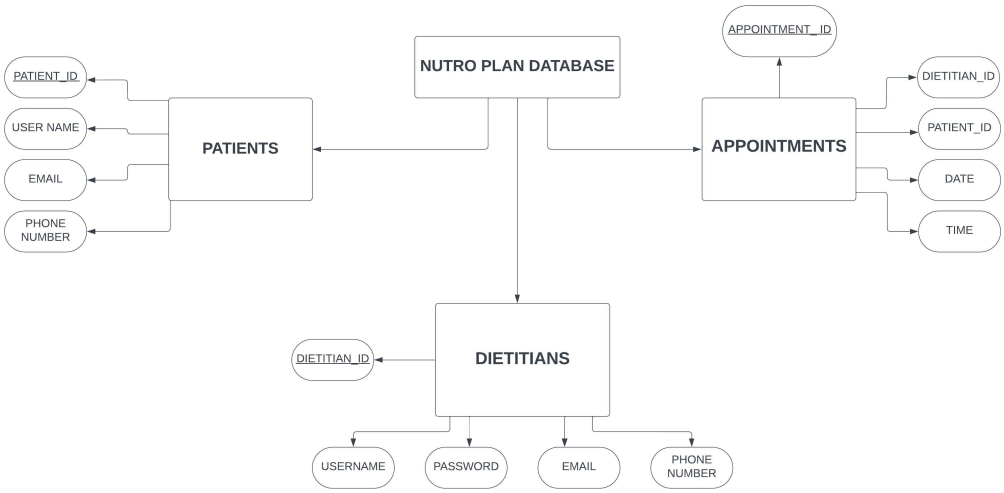

Figure 2: Database Overview Diagram

Three related entities are in the Nutro Plan database: Patient, Appointment, and Dietitian. Patient ID (unique identifier), username, email address, and phone number are among the attributes that make up the Patient entity. The Appointment entity is made up of the following: date, time, Dietitian ID (a foreign key referring Dietitian entity), Patient ID (a unique identifier), and Appointment ID (a foreign key referencing Patient entity). Every appointment is linked to a particular patient and dietician, and these associations are made possible by the corresponding foreign keys. The Dietitian entity includes the following attributes: email address, phone number, password, username, and Dietitian ID (unique identification). By facilitating the arrangement of data regarding patients, appointments, and dietitians, this structured database design preserves relational integrity and enables effective data retrieval.

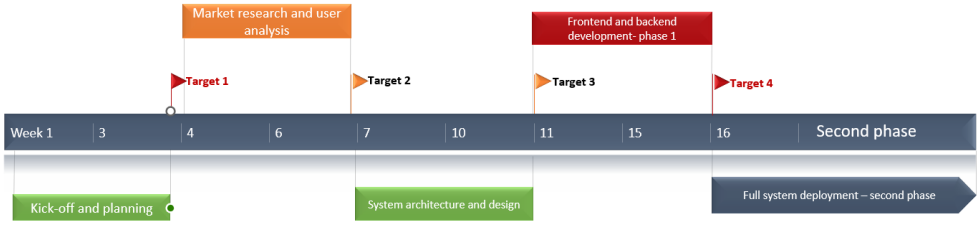

Figure 3: Timeline

The development of Nutroplan, our nutrition management system, is meticulously planned to ensure a systematic and efficient progression through key project phases. The timeplan, illustrated in Figure 1, provides a structured overview of the project milestones.

Week 1-3 - Project Planning – Week 1-3: The initial weeks focus on comprehensive project planning. This phase involves defining project scope, setting objectives, and assembling the project team. Detailed planning ensures a solid foundation for the subsequent phases of development.

Week 4-6: Market Research and User Analysis: Weeks 4-6 are dedicated to in-depth market research and user analysis. Understanding user needs and preferences is crucial for tailoring Nutroplan to meet the specific requirements of dietitians effectively. Market research informs strategic decisions for the system's features and functionalities.

4 Methodology

The development of Nutroplan, a Windows application designed for dietitians, involved a strategic methodology harnessing various technologies. Visual Studio served as our primary tool for C# coding, facilitating the creation of a user-friendly interface and functional modules. Microsoft SQL Server was pivotal in managing critical data such as appointment schedules, patient profiles, and food calorie information, ensuring secure and scalable database operations. GitHub played a key role in enabling collaborative development by allowing seamless code sharing and version control among team members.

Our approach encompassed essential modules on the dashboard, including appointment management, patient data storage, a food calorie database, patient profiles, and an education section. An iterative development process, combined with regular testing and stakeholder feedback, ensured the application's reliability, functionality, and user satisfaction. Nutroplan was crafted to provide a comprehensive solution, leveraging the synergy of advanced technologies and a systematic methodology to empower dietitians in efficiently managing their work.

5 Conclusion and Future Works

In conclusion, even though Nutroplan is still in the early planning stages, our goal is clear: to create a useful tool for dietitians. The project's roadmap and upcoming plans highlight our commitment to making Nutroplan a game-changer in nutrition management. We envision it simplifying tasks for dietitians and making a meaningful impact in the field. Looking ahead, we'll listen to user feedback, improve features, collaborate, prioritize data security, and offer user support to ensure Nutroplan meets the needs of dietitians. The journey ahead promises new ideas, teamwork, and positive changes in how nutrition management is approached.

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