

# Evaluation of an Electronic Application for Nutritional Information in Food Service Outlets: A Pilot mHealth Application

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## ABSTRACT

Technological solutions provided to consumers with the aim of nutritional information, could be a major challenge of interaction among caterers and consumers. The purpose of this paper is to evaluate an Electronic Intelligent System of Personalized Dietary Advice (called “DISYS”) for tablets and smart-phones. This application provides nutritional analysis of menu items and personalized suggestions according to the nutritional demands of each customer. The DISYS application was characterized as an easy-to-use, comprehensive and useful tool. Volunteers consider that this application contributes to overall health by enabling the modulation of body weight throughout healthier choices, reduction of calorie intake and self-monitoring. Application of mHealth as such, designed to provide nutritional information, seems to be useful for customers as they recommend appropriate nutritional options. They seem also to be an effective tool for caterers and nutritionists, who can provide value-added services.

## KEYWORDS

Electronic Application, Evaluation, Food Service, Information, mHealth, Nutrition

## INTRODUCTION

Nowadays when obesity and nutrition related diseases consist a major problem of public health, there is an increasing demand for nutritional information. As well in Greece as much in whole Europe, obesity has reached epidemic dimensions. Excessive body weight gain has been partly associated with eating away-from-home. This is attributed to the food choices made which are mainly high in energy, added sugars and saturated fats while other nutrients, such as fibers, calcium and vitamins, are deprived. The attention of Health organizations is focusing around nutrition information for consumers inside and outside the home. Dietary information is primarily provided by menu labels, which had firstly been enforced in New York City in order to give information on meals content, and restaurants websites. Nowadays, customers seem to be more conscious and aware of food quality served in restaurants.

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According to the National Restaurant Association, this trend has led food service industry to offer options of healthier nutrition, by making improvements in their daily menus. Towards this goal and in the effort to cope with customers' demands, restaurateurs seek for an intersectional cooperation with food industry, suppliers, nutritionists and policymakers.

The rapid development of technological devices provides customers with great opportunities in the framework of nutritional information and guidance. In particular, applications designed for use on mobile technologies, i.e., smartphones and tablets, known as mHealth applications or mHealth "apps" can be used in large-scale interventions providing health care information. These applications offer the potential for active management and participation of consumers in the process of improving their diet and health outcomes. Technological solutions offered by mHealth can constitute a challenging field of interaction and communication among consumers and caterers for healthier choices. Since technological gadgets are part of our everyday life, development of applications provide fertile ground for real-time behavior change interventions.

According to the Association of American Medical Colleges, the number of mHealth apps exceeded 40,000 in 2012. At the same time, apps for nutrition information in restaurants, gain public acceptance. In this framework, we took part in the design and development of an Electronic Intelligent System of Personalized Dietary Advice called "DISYS" (<http://www.disys.gr>). This application by evaluating personal nutritional profile and health factors, i.e., body weight, blood sugar, arterial pressure etc., suggests healthy choices in restaurant menus. In a more technical sense, it runs sophisticated algorithms that analyze the nutritional value of each meal as well as the impact on consumers' health. This is an innovative Greek application as it permits an active interaction among consumers and restaurant owners. In contrast to the most available apps that offer just a nutritional analysis of menu items. Another app similar with mHealth service is the Tesco Health and Wellbeing app by Tesco Store which aims mostly on retail products (<http://www.tesco.com/apps/android/health-wellbeing>).

This research aims to evaluate the pilot operation of the "DISYS" application by end-users. In the assessment, factors such as technical features, taste satisfaction, information provided, as well as, the effect on nutrition and health are included.

## METHODS

A specific questionnaire, which consists of 15 questions, was developed in order to evaluate DISYS app. Potential answers were either in closed fields or in 5 grade likert scale, i.e., Not at all, A little, Moderate, Enough, Very much. The questionnaire as an electronic form is incorporated into the application and requires filling after the first use by the customer. End-users can have access to the "DISYS" features either via a web-browser or use as an application on a smartphone or tablet running on android platform.

Businesses operating in the Ho.Re.Ca. sector participated in the pilot application and trusted their recipes to our team. Menus and nutritional information were uploaded on the platform to be available for potential customers. Actual testing was performed with real customers and menus in a typical hotel in one of the most touristic areas and in a typical restaurant in an urban area. In particular the pilot application was performed at the main restaurant of the Antigoni Beach Resort hotel in Chalkidiki and at the "NINNOLO" restaurant in Athens.

The chefs were responsible for feeding information of the menus in the system, according to the guidance of dietitians. Pilot application, and collection of questionnaires, took place in July-August 2015, with 75 volunteer users. Brochures and promotional banners were used in order to promote

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