Profile-based System for Nutritional Information Management

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Introduction

- Lifestyle in modern societies
  - Stressful work life
  - Lack of time to exercise
  - Inadequate diet

Introduction

- Profileration of medical conditions requiring strict dietary restrictions
  - Diabetes, hypertension, allergies...

WHO alerts for the increase of high blood pressure, diabetes and obesity.

Newspaper headline

Objectives

- Make use of information technologies to improve the general population lifestyle
- Propose a solution allowing people to obtain informed food choices falling in their profile
  - Dietary restrictions
  - Dietary options

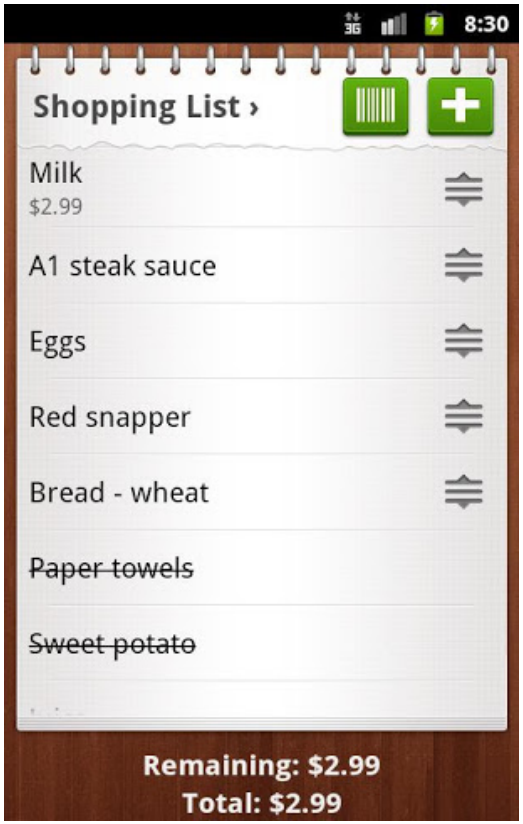
State of the Art: Nutritional control

- Works that address the nutritional control topic by recording the food consumed by people

- Profile-based System for Nutritional Information Management

State of the Art: Shopping assistants

- Intelligent/automated shopping assistants



- Profile-based System for Nutritional Information Management

State of the Art

- Nutricional
  - Records of meals - food diary, definition of a goal to achieve
  - The main concern is the amount of calories ingested
- Shopping assistants
  - Mainly focused in comercial purposes: Price comparison, Locate products inside the store, Shopping lists management
  - Just manage user's shopping lists
- The area of nutritional recommendation and food counseling is not properly explored yet

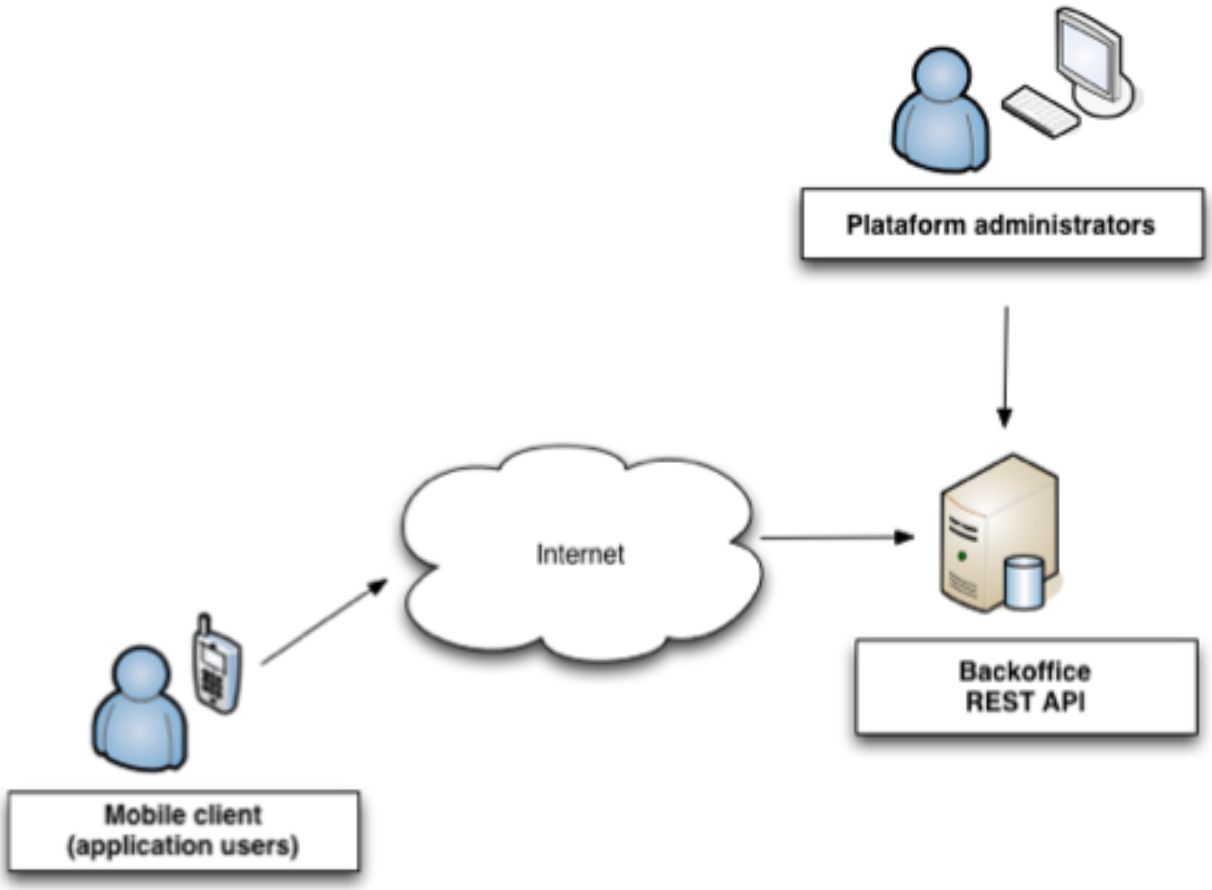
State of the Art

- There is room for the development of a solution combining both areas:
  - Nutritional control
  - Shopping assistants

- "Smart shopping list assistant"
  - Definition of users' individual nutritional profile
  - Food recommendations based on that profile

Proposed solution

- High level overview



Proposed solution: Key concepts (1/2)

- Item: product stored in the database and can be contained in one or more categories. i.e. “Cheese brand X 50 grams" or "Soya Milk brand Y 1L”
- Category: class where an item fits; can be organized in an hierarchical structure
- Property: one of the characteristics which identify an item. Each item has a set of properties, i.e. the percentage of DRI (Dietary Reference Intake) of proteins or salt, the product price, etc.

Proposed solution: Key concepts (2/2)

- Unit: a property has an associated unit. i.e. given the previous example, the unit "Euros" for the product price, and the unit "Percentage" to represent the DRI of proteins and salt

- Profile: set of properties and their respective values that characterize the profile. The values of each property can be exact values or ranges of values, and represent a rule mapped in the profile.

Proposed solution

- Mobile client functionalities
  - Nutritional profile definition/import existing templates
  - Manage shopping lists
  - Navigation through existing products database
  - Food filtering based on the rules defined in the profile
- Server
  - Communication with mobile client
  - Data management through a web backoffice

Experimental Setup: Tests

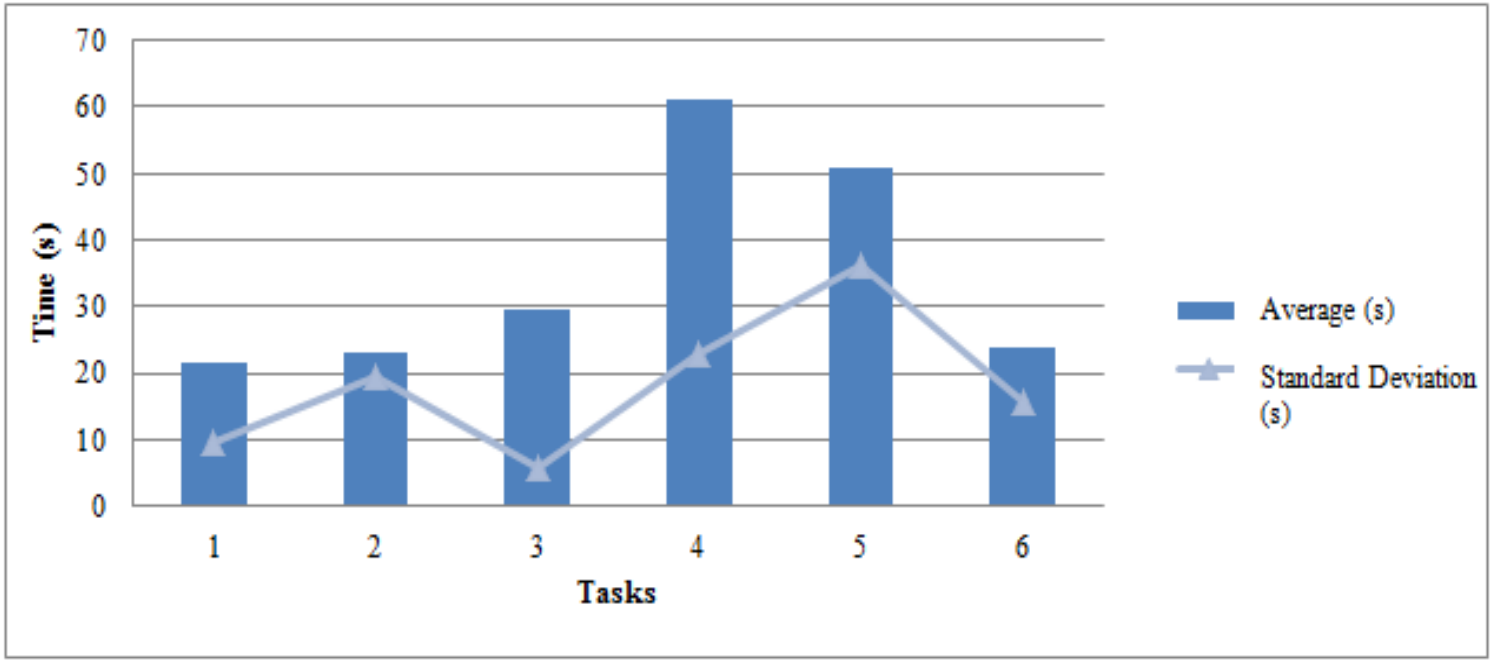
- Focused on determine if the concepts introduced by the application were clear for the users
- 8 people – all smartphone users – aged between 21 and 29 years old were invited to test the application
- An environment was setup simulating a real use of the application (containing real products, properties, units and profiles)

Experimental Setup: Tasks

1. Import and a configure a profile called "Light products" from the server;
2. Create a new shopping list based on a previous shopping list kept in the historic;
3. Add a specific product the shopping list which fits in the "Light Products" profile;
4. Add a product through barcode scanning;
5. Add a specific product not fitting in the "Light Products" profile;
6. Assuming that not all products were available in the supermarket, register that information in the shopping list and archive it in the historic.

Results

- Distribution of times (in seconds) to complete each task



Results

- In general, all testers felt comfortable and curious to explore the application interface
- In some cases, users insisted in repeating some of the tasks more than once
- Users had no problem to complete the shopping related tasks using different strategies (filtered list, barcode scanning and unfiltered product list)
- Some confusion while performing administrative tasks such as importing profiles form the server or archiving a shopping list

Conclusions

- The area of nutritional advice and counseling hasn't been properly explored
  - Room for a solution combining both areas of shopping assistants and nutritional control
- The preliminary tests suggest that applying profiles through simple filters could be improved
- Users were enthusiastic to test regular shopping features and curious about the profiling mechanism

Future work

- Integration of the existing product database with a real retail chain supplier
  - Large database of products and characteristics
  - Up to date information
- Explore more transparent profiling mechanisms
- Provide statistics adapted to the specific profile in use

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