



Virtual Dietician

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Abstract: In the world we live in today, we make use of mobile application for most of our tasks to save time and money. Using the modern available technological knowledge, almost every simple task can be done by a mobile application. So, in this project, a Virtual Dietician application is developed which also make use of Artificial Intelligence. It takes user data and then calculates the cost function considering various factors like availability, popularity, protein content, fat content, carbohydrate content and son on of the food items and gives the appropriate diet to the user.

Keywords: natural language processing, speech recognition, artificial intelligence

I. INTRODUCTION

We live in a world today where everything is fast paced. People are so busy with their work schedule that they hardly get time to take care of themselves, maintain their diets, etc. Many a times, they are so busy that they forget about their dietary consumption, which then results in them having various health issues. Amongst all this, they may

not have time to go to a dietician and consult about their dietary problems. And thus many of them just avoid going. To solve this problem, we came up with this android application project called "Virtual Dietician".

Nowadays, people all around the world use smartphones. Smartphones aim at making things easier for us, by allowing us to do most of our tasks on it. We use apps for performing mostly all our tasks on our smartphone. So, our idea was to build an android application which will fill the place of a real world dietician, which people can use on the go. So now, with the help of this app, they won't need to make time for a dietician's appointment. They can directly download this app, fill in their details, answer a few questions and they would be provided with various diet options. Then they have to choose one of the diet and they are ready to go. After a fixed interval of time again data would be asked from the user and depending on whether the diet was effective or not, the user can change his/her diet. At last, if after the duration of diet if the user achieved lconsidered. Nine of the apps collected dietary intake, all using the same assessment method (i.e., food diary record).

EXISTING TOOLS AND SOFTWARES

A total of 13 apps that had at least 1 million installs are

Food selection was accomplished via text search and barcode scanning. Portion size selection was conducted by selecting text, and not by images or icons. Image recognition, natural language processing, and artificial intelligence did not feature in the apps. There is significant opportunity for improvement in terms of personalized nutrition, which could include individualized feedback, diet plans, or nutrition education.

II. FACTORS AFFECTING SPEECH RECOGNITION

These are those factors:

1. Proportion of speech-The proportion of the speech/talk also plays a major role.
2. Interruption rate-The in between disturbance or interruption between the chat.
3. Duration-The duration of the chat i.e. the time for which the user chats or the speed with which he/she talks.
4. Effect of linguistic factors-Hence people can interact in different languages or even if in same language the accent can vary. Hence this affects the speech recognition.
5. Effect of talker gender-The gender (male/female) who interacts with the system affects speech as the quality, pitch, etc., varies significantly.
6. Effect of presentation level-There are various levels but the presentation level depicts how the sound will be accepted by the system and how it would respond.

III. METHODS ATTEMPTED

Virtual assistant (buddy system):

Our virtual assistant is created using API.ai

You can talk to it as and it replies with an appropriate reply. It also keeps track of the conversation and gives smart reply which match the context of the conversation

Api.ai:

API.AI is a natural language understanding platform that makes it easy for developers (and non-developers) to design and integrate intelligent and sophisticated conversational user interfaces into mobile apps, web applications, devices, and bots. Their goal is to make the process of creating and integrating sophisticated conversational user interfaces as simple as possible. API.AI is a platform for building conversational interfaces for bots, applications, and devices.

Cost function:

We use a logic called as cost function to rank the food items based on their scores. We calculate the cost by using the factors stored in local Databases. We assign the scores to all function and based on the experience we keep

updating the scores and the rank. So, while the buddy selects a food item for recommending diets, it checks their ranks and selects accordingly.

IV. METHODOLOGY

The actual working of this application is pretty simple. The user will download the application on their smartphone and they are ready to go. They have to first make an id on the application. Here, the user needs to fill in data like their height, weight age, BMI, their food choices, their location (for knowing their cuisine), etc. This information then gets associated with that id and the will be considered for further evaluation. With this the user is done with his initialization. Now, after this is done, the AI checks the details filled and performs calculations of the nutrition intake, calories, etc., with respect to the age and prepares a dietary report for the user to see, and accordingly comes up with various diet options for the user. These can be weekly, fortnightly or monthly. The user can select any of the plans provided. Now the application allots that plan to the user, and keeps a daily check. The user has to enter his consumption details daily, so that the application can monitor likewise. After the set duration of the plan, the user has to give information about any changes, observed. And based on that, the application decides the further diet plans for the user. These plans are pretty customizable. The user can opt for the any changes in the menu items said in the plan, according to his conveniences. The application also takes into account his allergies, intolerances and things like that. The application gives you constant reminder, if you skip your plans, or have something in access etc. It will alert you for any problems beforehand, by giving warnings, so that you know what to continue and what to stop.

All of these might be boring with typed texts, so our application has speech recognition and text-to-speech features, which users can use if they want according to their convenience. This makes the experience more interactive and enjoyable. So, with this application, users can monitor diet and lead a happy and healthy life. All in all, using this application is like having a good friend, who is conscious about your diet. It's like having all the services you get visiting a dietician, without actually visiting one and being able to carry them around in your smartphone

Two input options: Voice & Typed text

The user can give either a typed text or a voice input based on his/her convenience.

Keyword Processing: Delimiter, Array of words

Keywords will be processed using any of these techniques.

Pattern Matching/Recognition:

Pattern matching will make use of previous experiences, internet, and the pattern recorded is added to the DB.

Neural Networks:

Most probable, efficient and suitable meaning of the input is deciphered; best decision is taken, based on the meaning deciphered and it is also recorded in the DB.

Text-to-Speech:

Since the output is in text format, it gets converted into speech and given back to the user as voice output, depending on the user's choice,

Chatbot feature:

In chatbot, decisions taken are implemented and user is made known of those decisions (situational).

Monitoring Diet:

Daily dietary input is taken from user and based on the input; health statistics is calculated and presented to the user.

Results

This is the online food database structure-

Server: localhost Database: a2524625_food Table: Food

Field	Type	Collation	Attributes	Null	Default	Extra	Action
<input type="checkbox"/> id	int(50)			No		auto_increment	
<input type="checkbox"/> Name	varchar(100)	latin1_general_ci		No			
<input type="checkbox"/> Amount	varchar(100)	latin1_general_ci		No			
<input type="checkbox"/> Calories	int(10)			No			
<input type="checkbox"/> Fats	int(50)			No			
<input type="checkbox"/> Cholesterol	int(50)			No			
<input type="checkbox"/> Carbohydrates	int(50)			No			
<input type="checkbox"/> Fibre	int(50)			No			
<input type="checkbox"/> Proteins	int(50)			No			
<input type="checkbox"/> Sugar	int(100)			No			

Check All / Uncheck All With selected:

Server: localhost Database: a2524625_food Table: Diet

Field	Type	Collation	Attributes	Null	Default	Extra	Action
<input type="checkbox"/> ID	float			No			
<input type="checkbox"/> BreakfastItem	varchar(100)	latin1_general_ci		No			
<input type="checkbox"/> BreakfastItemQuant	varchar(100)	latin1_general_ci		No			
<input type="checkbox"/> MidMorningSnack	varchar(100)	latin1_general_ci		No			
<input type="checkbox"/> MidMorningSnackQuant	varchar(100)	latin1_general_ci		No			
<input type="checkbox"/> Lunch	varchar(100)	latin1_general_ci		No			
<input type="checkbox"/> LunchQuant	varchar(100)	latin1_general_ci		No			
<input type="checkbox"/> EveningSnack	varchar(100)	latin1_general_ci		No			
<input type="checkbox"/> EveningSnackQuant	varchar(100)	latin1_general_ci		No			
<input type="checkbox"/> Dinner	varchar(100)	latin1_general_ci		No			
<input type="checkbox"/> DinnerQuant	varchar(100)	latin1_general_ci		No			
<input type="checkbox"/> TotalCalories	int(10)			No			
<input type="checkbox"/> Gender	varchar(100)	latin1_general_ci		No			

Check All / Uncheck All With selected:

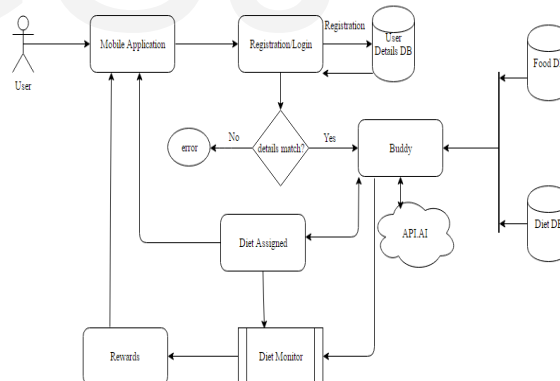
Online user database structure-

Server: localhost Database: a2524625_food Table: UserDetails

Field	Type	Collation	Attributes	Null	Default	Extra	Action
<input type="checkbox"/> Username	varchar(100)	latin1_general_ci		No			
<input type="checkbox"/> Password	varchar(500)	latin1_general_ci		No			
<input type="checkbox"/> Name	varchar(100)	latin1_general_ci		No			
<input type="checkbox"/> email	varchar(100)	latin1_general_ci		No			
<input type="checkbox"/> Gender	varchar(100)	latin1_general_ci		No			
<input type="checkbox"/> DateofBirth	date			No			
<input type="checkbox"/> Age	int(10)			No			
<input type="checkbox"/> Location	varchar(100)	latin1_general_ci		No			
<input type="checkbox"/> Weight	int(100)			No			
<input type="checkbox"/> Height	int(100)			No			
<input type="checkbox"/> BMI	int(100)			No			
<input type="checkbox"/> Allergies	varchar(100)	latin1_general_ci		No			
<input type="checkbox"/> Disease	varchar(100)	latin1_general_ci		No			
<input type="checkbox"/> Smoke	varchar(20)	latin1_general_ci		No			
<input type="checkbox"/> DrinkAlcohol	varchar(20)	latin1_general_ci		No			

Check All / Uncheck All With selected:

Working of the app-



Online diet database structure-

FUTURE ENHANCEMENTS

Regular input must be taken from the user(weight) in order to check for effectiveness of the app. Work out and other sessions of the user which could affect his/her weight should be taken into account.

The buddy should be such that it should work offline too.

CONCLUSION

This app is helpful for people of all age groups and lifestyle but especially for those who lead a sedentary life and do not get time for physical activity. They can maintain their health by using this virtual dietician app. The high number of registered users in the presently available diet apps in the market indicates that there is a clear interest and opportunity for diet monitoring and recommendation using mobile apps. All the apps collecting dietary intake used the same nutrition assessment method (i.e., food diary record) and technologies for data input (i.e., text search and barcode scanner). Emerging technologies, such as image recognition, natural language processing, and artificial intelligence, were not identified. In this project the user can give input as text as well as voice messages. Also the app will give notifications to the user at their provided meal timings in order to remind them of their diet so that they do not forget to follow their diet. The app provides the user mainly with the food items which is available in his/her locality based on the popularity of the food item at that location. Hence it won't be much difficult for the user to follow the diet.

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