



Health Finder

Persuading People to Eat Healthy

Interaction Design | Project 2 | Report

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M.Des 2015-2017

Guide

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Declaration

I declare that this written document represents my ideas in my own words and where others ideas or words have been included, I have adequately cited and referenced the original sources.

I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/ source in my submission.

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21st Dec, 2016

Approval Sheet

The project titled 'Persuading people to eat healthy' by Shreya Mukta, is approved for partial fulfillment of the requirement for the degree of 'Master of Design' in Interaction Design.

Guide

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Date 4/1/17

Acknowledgement

My sincerest gratitude to my guide Prof Ravi Poovaiah who guided me throughout the length of this project.

I would also like to thank Prof Alka and Prof Venkat for listening and giving space to whatever creative blocks I encountered.

I would also like to thank my seniors, Prasad, Jayati and Kore, for helping me when I was stuck.

Mighty thanks to my dear friends Udbhav, Salik, Neha and Saloni for all the help and emotional support.

Words would be less to acknowledge the tremendous support and help of my dear friends Harshit Sinha without whom I would not have completed the project. I'm so grateful to have you around.

Lastly, a huge share of gratitude to my parents and siblings who love me to no extent and are always there to support me.

Abstract

Non-communicable diseases would become the leading cause of death in the world by 2030. Most of these diseases are caused due to poor dietary habits, addictions to tobacco and alcohol, and a sedentary lifestyle. The aim of the project is to focus on the dietary habits of people. What people eat in their 20s determines the likelihood of them contracting lifestyle diseases in the subsequent decades.

The idea is to persuade people to eat healthy. The target group is IIT students who are young adults in their 20s. They have an opportunity of getting into a healthier lifestyle before they enter the working phase. The design solution focussed on making healthy food more visible.

While most students believe that the mess food is healthy, a lot of them confess to having unhealthy lifestyles owing to erratic routines, skipping meals, etc. Some believe that there is a dearth of healthy food in the campus. As a matter of fact, the mess councils in all the messes have to abide by certain nutritional standards while designing their menus. This implies that the mess food is predominantly healthy and balanced.

So what could be done in order to push forth a healthy diet? The design solution focused on charting a merit list of food items during each meal as

per the user's BMI. This means that for an underweight user the menu would look different from that for an overweight user. The healthiest food suggestions occupied the green spot while the unhealthiest one occupied the red spot. The healthiness of the food items is defined by calculating the protein, carb and fat content of each.

While researches show that people modify their food consumption if they are exposed to the caloric or nutritional content right before they make purchase decisions, it is ambiguous as to where in lies an appropriate trigger in case of food which is not directly purchased, such as in a hostel mess. The project attempts to solve the problem of visibility of healthy food as well as the viability of the health prompts so that the user can be persuaded into making healthy food choices.

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1. Introduction

India has surpassed the US in the number of patients with Non Communicable Diseases(NCD).

1 in 4 Indians risks dying from an NCD before they reach the age of 70. In fact, an Indian today has over twice the odds of dying of a non-communicable disease than a communicable disease.

Most of these diseases do not have immunisation. The most common ones are diabetes, obesity, hypertension, cardiovascular diseases, etc. NCDs are caused, in part, by underlying, modifiable risk factors.

- Tobacco and alcohol consumption.
- No physical activity i.e sedentary lifestyle
- Poor dietary habits

All these factors lead to obesity and abnormal blood pressure and blood sugar. In 2010, top five reasons for death in India were diet related.

Unhealthy dietary habits have made a good amount of urban and rural population vulnerable to lifestyle diseases. It is a myth that only the rich are susceptible to obesity, diabetes and CVDs owing to cholesterol and fat rich diets. The poor are equally vulnerable.

Healthy dietary behaviour is an essential component of a healthy lifestyle. The sooner people get into one, the better. While most people change their dietary behavior after they have contracted a lifestyle disease, it becomes reasonable that people take timely action; or better still, eat healthy right from the start.

Defining the Target User:

Young adults in their 20s who have an opportunity of getting into a healthier lifestyle before they enter the working phase. The students living within the IIT campus have been targeted.

The IIT campus has well designed mess menus that are accessible through hostel websites. The menus across various canteens are also consistent. Thus, it is not difficult to track what students, collectively, are eating, unless they order food from outside.

Role of Technology in Persuading People for a Healthy Lifestyle:

There is a plethora of health based applications in the market. They cater to counting calories, maintaining diet records, keeping track of activity pattern, and some even help in fighting addiction. There are over 25 apps with more than a million downloads just to calculate calories.

Even though the number of downloads are not a dependable testimony for the usefulness of these apps, they do indicate the need for them. People are ready to accept the help of technology in getting into healthier lifestyles.

In reference to a campus like IIT Bombay, here almost all students own smartphones and are tech savvy, or at least are “tech literate”, an aid like an application hold some promise.

Why people eat what they eat?

Eating behavior is a complex interplay of various factors. They greatly influence meal timing, quantity of food intake, and food preference

- Physiology and metabolism
- Psychology in terms of perceptions regarding food
- Social factors such as peers, environment and culture
- Genetic factors as in how tastes are perceived

2. Literature Review

What directs or inspires people to eat healthy?

There are numerous ways in which a health conscious individual takes decisions in order to eat healthier foods.

- Calorie information often influences purchase behaviour of people. [1]
It is observed that among college students, women tend to consume less when aware of calorie information whereas, men tend to consume more.[2]
- Nutritional information on menus influence purchase behaviour of consumer of fast food items.[3]
- Eating partners influence one's eating habit for good as well as for bad.[4]
- People start eating healthy when they contract a disease.

What is the underlying principle while making such modifications in choice?

The theory of reasoned action assumes that people choose to take up a behavior or a habit after weighing the consequences of the same. Thus, the intention behind eating healthy food has a great role to play in modifying behaviours of the target group. The cons of eating junk food are known to all. But few people bother to act in the right direction.

What are these triggers that coax people to eat healthy?

- Apparent susceptibility towards certain diseases were found to be a reason for taking up healthier diets.

- The desire to be in a good shape often influence people to eat healthy.
- Peer groups often encourage people to go for workouts or take up healthier diets.
- People investing time and money on workouts often make healthy food choices.

What directs people to eat unhealthy?

The Present-biased preferences imply that people tend to make choices based on their present conditions, instead of weighing the pros and cons of the future.[5] As a result, an unhealthy food item is very likely to be chosen if it is tasty. Instant gratification plays a pivotal role in determining food choices and taste is the quickest to gratify. It is also called "time discounting."

Apart from that, there can be numerous other factors that can make people eat unhealthy food. Lack of time often results in people consuming unhealthy items like vada pav. The vada pav is tasty, high in energy content, portable, and easily available. It becomes a challenge to combat the idea of vada pav while tackling the problem of unhealthy food.

Besides, time constraints, availability of healthy food and price of healthy food are major determinants of healthy food choices. People often choose cheaper options at the cost of health. A few want to go out of the way to get a healthy snack, when an unhealthy one is readily available.

Are there ways to counter such behaviours?

It is observed that when people are asked to plan a diet for their future, they tend to make far healthier choices.[5] Also, if people are planning a diet when they are less hungry, they tend to make healthier choices. The very same Present-biased preferences, here, can be used strategically to push forth better choices.

Another way is to apply the model of Asymmetrically dominated choices.

[5] This is to say that if a healthy food item is placed next to an unhealthy one, and the contrast is stark, it would coax people to choose the healthier option.

To apply such a scheme, one could play with attractive pictures of healthy food, or color code the menu in such ways that starkly reflect the unhealthiness of poor options.

When does a Push become a Nudge?

In the book “Nudge”, behavioural economist Richard Thaler and law scholar Cass R. Sunstein talk about how giving people a sense of choice and making the better options more visible, one can manipulate choices.

“Putting the fruit at eye level counts as a nudge. Banning junk food does not.” While studies in Western contexts suggest that people do change their decisions while purchasing food if the nutritional and calorific content is mentioned at the time of purchase, researches are not very clear in the Indian context. The project focuses on making use of “nudges” to coax people into healthier diets.

3. Secondary Research

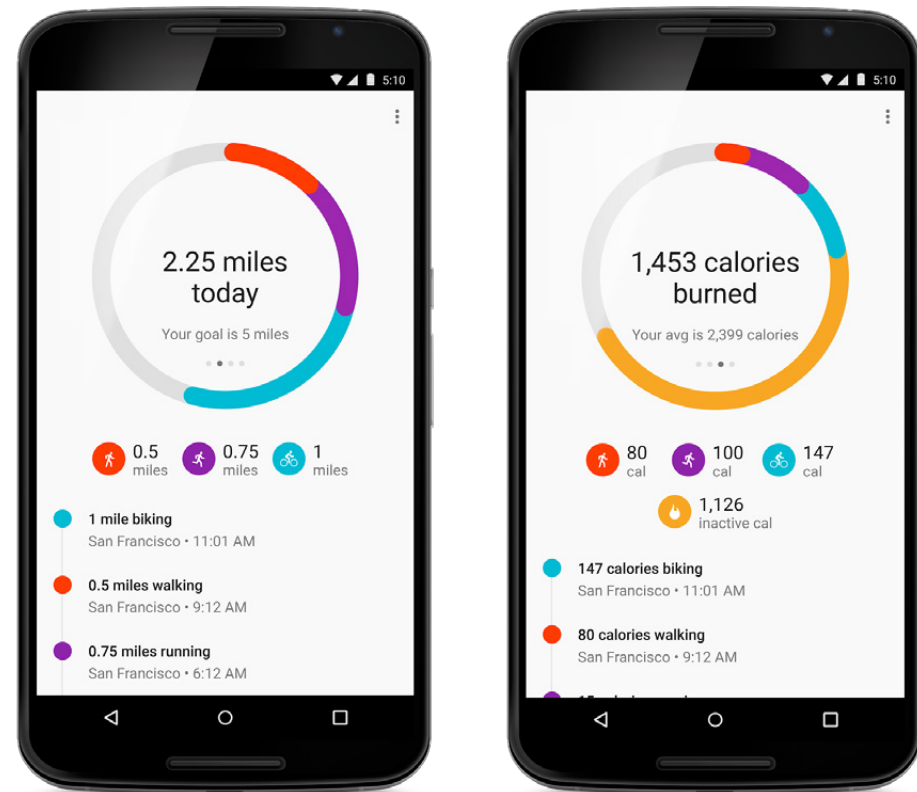
There are a wide variety of apps that govern the health sector. These apps range from connecting people to doctors and dieticians (the likes of practo) to activity trackers like Google Fit and Move. There are food tracking apps like MyFitnessPal and MyPlate that have an immense database of food items from throughout the world. They help in tracking calories as well as the nutritional breakup of the food one consumes.

Google Fit

The Google Fit app helps in tracking physical activities like running, cycling, jogging and walking. It can be integrated with calorie counter apps that keep diet logs so that the net calorie gain can be achieved.

The setbacks with the app are as follows:

- It counts the number of steps but does not inform what that number means, as in, is the pattern active or sedentary, etc.
- It takes autorickshaw rides as cycle rides.
- The plus points of the app are as follows:
- It gives a holistic evaluation of the recorded activity, in terms of calories burnt, time spent being active, etc.
- The web app lets you know your relative activity pattern with respect to the rest of the users in the city.
- It can be easily integrated with food log apps so that the net calorie count for the day can be achieved.



MyFitnessPal

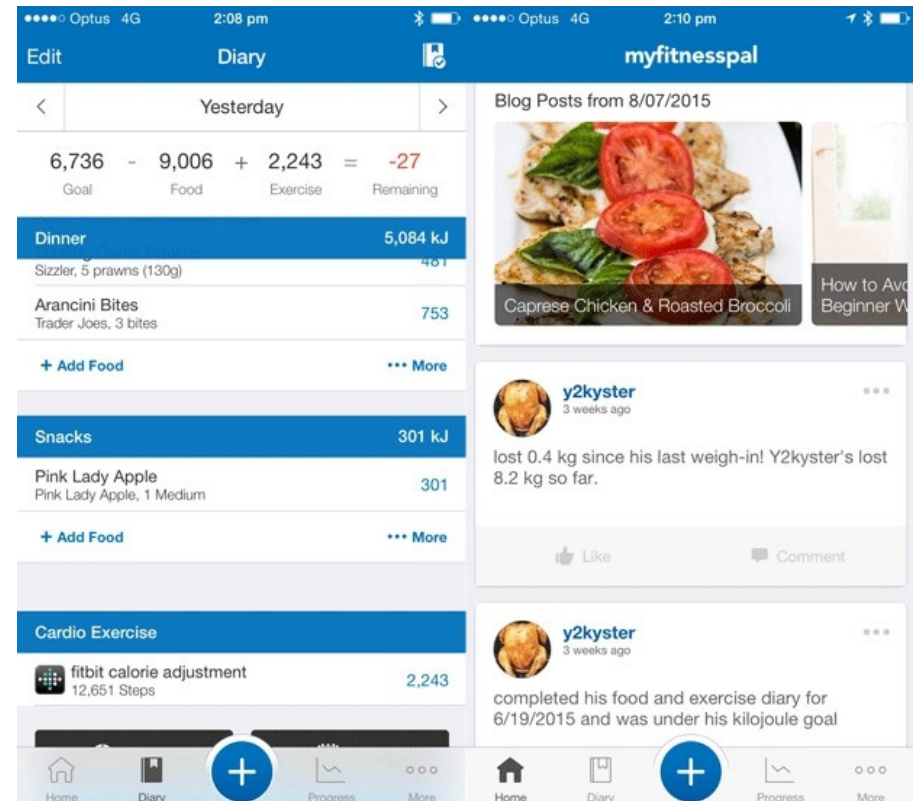
MyFitnessPal is a food tracking app that helps you log your food through its enormous database of food items from throughout the world. It also gives the nutritional breakdown of your consumption and helps set goals and targets. It also helps you share your progress with friends.

The setbacks of the app are as follows:

- It gives the nutritional breakdown but does not give the idea of what to make of that information.
- It is difficult sometimes to track the amount of food one consumed from the given set of options from the database.
- The detailed version needs to be paid for.

The plus points of the app are as follows:

- It gives a holistic evaluation of what one eats, in terms of calories, nutritional data, etc.
- It lets the user connect with friends so that competition or inspiration could work as incentives to eat better.
- It can scan barcodes to give nutrition facts.



Key Insights

- In most cases people do not want to enter data unless they are deeply invested in the idea of keeping a diet log. Hence, it becomes vital to avoid data entry as much as possible.
- The information which most apps provide is not consumable. What does 75% carb intake mean? What does 7500 steps a day mean? Unless this information is not cracked it is difficult for the user to become aware of and act on their behaviour.

4. Primary Research

A survey on 101 students of IIT Bombay was conducted over a weekend. Questions based on their perception of healthy food, their inclination towards apps, their idea of healthy food, the opinion on the availability of healthy food, etc were asked. There were 79 males and 22 females. most over Over 90% students were from IDC, IIT Bombay.

The major reasons behind the questionnaire was to understand if there is a perceived need of healthy food within the campus. Also, the survey helped in understanding how people consume food in terms of timings, skipping meals, etc.

Key Questions Asked

How often do you eat in canteens? - This was asked to know the relevance of canteens in the food intake of students considering the fact that most of the canteen food is unhealthy.

How often do you make conscious decisions to purchase healthier foods?

- This question was asked to know if people are health conscious at all and also to know how people perceive their health consciousness.

How often do you eat outside or purchase food from outside the campus?

- This questions was asked to know how dependant people are on the food available within the campus. A design solution meant for options within the campus would obviously be more effective if most of the consumption is from here.

Do you think your mess provides enough healthy food?

- This question was asked to understand the people's perception towards their mess and also if they are satisfied with the food they are supposed to eat by default.

Do you depend upon your friends while deciding where and what you eat?

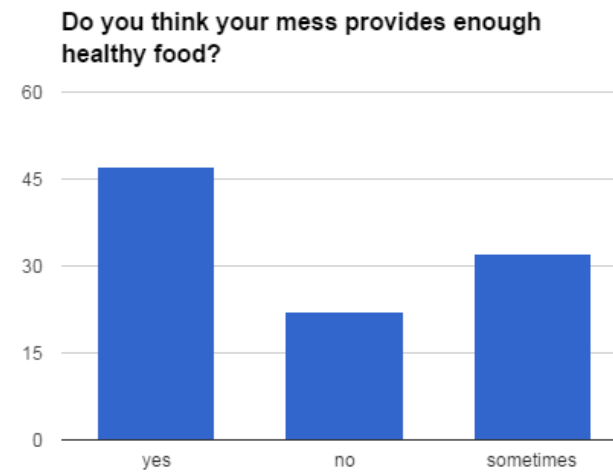
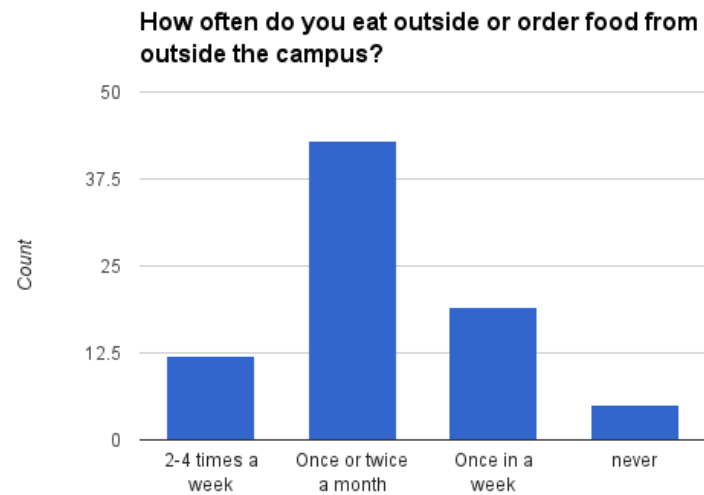
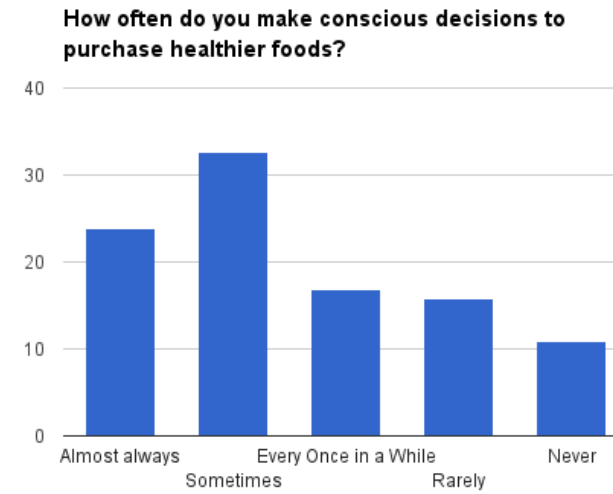
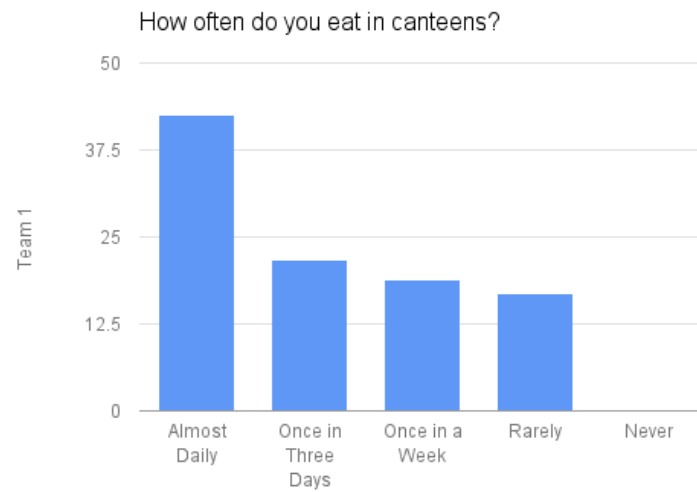
- This question was asked to know if there is a scope of design solutions based on social interactions, or if students can be coaxed into healthier lifestyles through competitions or inspiration.

Findings:

- 46.5% of the people think that the mess provides enough healthy food. While only 22% think otherwise.
- Over 60% people feel that there is a scarcity of healthy food options in and around the campus.
- Most people eat regularly in canteens, with more than 60% eating at least twice a week there.
- More than 56% people are fairly conscious of healthiness of an eatable while making purchase decisions. Whether their understanding of what is healthy is consistent with facts is another matter; but even aspiring to purchase healthy is a good start.
- More than 80% manage to have their lunch and dinner almost daily, whereas only 45% people manage to have their breakfast as regularly.
- About 15% people have used fitness related apps in the past but have then, uninstalled them. 12% people do use fitness related apps that either track their activity pattern or count calories.
- More than 40% agreed to depend upon their friends regarding what or where they ate.

The key insights include:

- Mess food is found to be healthy by a good number of people, and, as a matter of fact, it is healthy. Thus, working on the visibility of healthy portions of the mess menu has a scope.
- Most people eat in the canteen very regularly, and thus, it becomes vital to bring into the picture the healthiness of the canteen food. Since most people agree to be conscious of spending their money in healthy food items, there is the scope for working on this section of students regarding their eating in the canteens.
- Where and what their friends are eating gives scope for community oriented design ideas where people can take inspiration or compete with their friends regarding healthier dietary habits.
- The pilot could be tested during lunch and dinners since these are the meals people are least likely to skip. Also, a major portion of people's calorie intake is through these two meals, thus, monitoring them might result in visible changes.



5. Defining the Healthiness

To define the healthiness of various food items and to define the limits of nutritional values for various age groups and genders, the book called “Preventive and Social Medicine” by K Parks was used. It covers an entire chapter on Nutrition and Health which states ranges and limits for protein, carbs, and fat intake and all the other vital nutrients.

Reference Body Weights

Age, gender and body weight are major factors in determining the nutritional requirements of an individual.

Reference Man is aged between 18-29 years and weighs 60kg with a height of 1.73m and a BMI of 20.3; is free from diseases and is physically fit for active work. He spends 8 hours in occupation doing moderately active work, 8 hours in bed, 2 hours in physical activity and recreation and 4-6 hours sitting and moving about.

Reference Woman is aged between 18-29 years and weighs 55 kg with a height of 1.61m and a BMI of 21.2; is non-pregnant-non lactating; is free from diseases and is physically fit for active work. She spends 8 hours in occupation doing moderately active work, 8 hours in bed, 2 hours in physical activity and recreation and 4-6 hours sitting and moving about.

Energy Requirements across Gender and Lifestyle

The main source of energy in Indian food which is predominantly plant based are protein, carbs, fats and fibre. They provide energy at the following rates:

Protein: 4 kcal/g

Carbohydrates: 4 kcal/g

Fats: 9 kcal/g

Fibre: 2 kcal/g

Protein Requirements:

It depends on the physiology, age, sex, stress levels, infections, etc.

Thus, it would vary from individual to individual.

Roughly it should comprise of at least 18% of total energy intake.

TABLE 24
Energy requirements of Indians at different ages (2010)

Age group	Category	Body weights	Requirement	
			(kcal/d) ^a	(kcal/kg/day)
Man	Sedentary work	60	2,320	39
	Moderate work	60	2,730	46
	Heavy work	60	3,490	58
Woman	Sedentary work	55	1,900	35
	Moderate work	55	2,230	41
	Heavy work	55	2,850	52
	Pregnant woman	55 + GWG ^b	+ 350	
	Lactation	55 + WG ^c	+ 600	
Infants	0-6 months	5.4	500	92
	6-12 months	8.4	670	80
Children	1-3 years	12.9	1,060	82
	4-6 years	18.1	1,350	75
	7-9 years	25.1	1,690	67
Boys	10-12 years	34.3	2,190	64

TABLE 1
Protein contents of some foods

Food	Protein (g. per 100 g. of food)
<i>Antimal foods :</i>	
Milk	3.2-4.3
Meat	18.0-26.0
Egg	13.0
Fish	15.0-23.0
<i>Plant foods :</i>	
Cereals	6.0-13.0
Pulses	21.0-28.0
Vegetables	1-4
Fruits	1-3
Nuts	4.5-29.0
Soyabean	43.2
<i>Others :</i>	
Oils and fats	nil
Sugar and jaggery	nil

Fat Requirements:

The daily requirement of fat is not known with certainty. An adult requires 20% of its energy from fats.

Carbohydrates Requirements:

The recommended amounts of carbs in a balanced diet is such that it contributes to 50-80% of energy requirements. However, most indian diets take the level to 90%, making the diet unhealthy.

TABLE 28

Recommendations for dietary fat intake for Indians (2010)

Age/Gender/ Physiological groups	Physical activity	Minimum level of Total fat (% E)	Fat from foods other than visible fats, % E	Visible fat %E	g/p/d
Adult Man	Sedentary	20	10	10	25
	Moderate				30
	Heavy				40
	Sedentary	20	10	10	20
	Moderate				25
	Heavy				30
Adult Woman	Pregnant women	20	10	10	30
	Lactating women				30
Infants	0 - 6 months	40-60	10	Human milk	
	7-24 months	35		25	25
Children	3-6 years	25	10	15	25
	7-9 years				30
Boys	10-12 years				35
	13-15 years				45
	16-17 years				50
Girls	10-12 years				35

Classification	GI range	Examples
Low GI	55 or less	most fruit and vegetables (except potatoes, watermelon and sweet corn), whole grains, pasta foods, beans, lentils
Medium GI	56-69	sucrose, basmati rice, brown rice
High GI	70 or more	corn flakes, baked potato, some white rice varieties (e.g. jasmine), white bread, candy bar and syrupy foods.

GI - Glycaemic index

Dietary Fibre Requirements:

Dietary fibre is the remnant of the edible part of the plant after digestion. They are known to reduce blood cholesterol and glucose levels.

TABLE 4

Different dietary fibre fractions in selected Indian foods

Food Group	Food Item	Fibre content g/100 g edible portion			Soluble TDF *)
		Crude fibre	TDF *	Soluble	
Cereals	Rice	0.2	4.11	0.92	22.4
	Wheat	0.3	12.48	2.84	22.7
	Bajra	1.2	11.33	2.19	19.3
	Maize	2.7	11.54	1.65	14.2
	Jowar	1.6	9.67	1.64	17.0
	Ragi	3.6	11.85	0.89	7.50
Pulses, dhals	Lentil	0.7	10.31	2.04	19.8
	Chick pea	1.2	15.30	2.56	16.7
	Pigeon pea	0.9	9.14	2.33	25.4
	Green gram	0.8	8.23	1.69	20.5
Vegetables	Cluster beans	3.2	5.7	1.6	28.0
	Brinjal	1.3	6.3	1.7	27.0
	Cabbage	-	2.8	0.8	28.6
	Cauliflower	1.2	3.7	1.1	30.3
	Bhendi	1.2	3.6	1.0	26.9
Roots and Tubers	Potato	0.4	1.7	0.6	33.5
	Carrot	1.2	4.4	1.4	30.6
	Onion	0.6	2.5	0.8	32.0

Apart from Protein, fats and carbs, there are a wide variety of other vitamins and minerals essential for a healthy and balanced diet. The following table illustrates the figures.

ANNEXURE-2
BALANCED DIETS
(The quantities are given in grams)

Food Item	Adult man			Adult woman			Children		Boys	Girls
	Seden- tary	Moderate work	Heavy work	Seden- tary	Moderate work	Heavy work	1-3 years	4-6 years	10-12 years	10-12 years
Cereals	460	520	670	410	440	575	175	270	420	380
Pulses	40	50	60	40	45	50	35	35	45	45
Leafy vegetables	40	40	40	100	100	50	40	50	50	50
Other vegetables	60	70	80	40	40	100	20	30	50	50
Roots and tubers	50	60	80	50	50	60	10	20	30	30
Milk	150	200	250	100	150	200	300	250	250	250
Oil and Fat	40	45	65	20	25	40	15	25	40	35
Sugar or Jaggery	30	35	55	20	20	40	30	40	45	45

Source : (140)

The overall picture of a balanced diet look like the following table:

The hotel messes in IIT Bombay have each got a mess council that deigns the mess menus. The mess menus are very balanced in terms of nutritional level and cultural diversity. This ensures that each student has access to healthy and comfortable diets.

TABLE 29

Summary of Recommended Dietary Allowances (RDA) for energy, protein, fat and minerals for Indians – 2010

Group	Category/Age	Body weight (kg)	Net energy (kcal/d)	Protein (g/d)	Visible fat (g/d)	Calcium (mg/d)	Iron (mg/d)	Zinc (mg/d)	Magnesium (mg/d)
Man	Sedentary work	60	2,320	60.0	25	600	17	12	340
	Moderate work		2,730		30				
	Heavy work		3,490		40				
Woman	Sedentary work	55	1,900	55.0	20	600	21	10	310
	Moderate work		2,230		25				
	Heavy work		2,850		30				
	Pregnant woman		+350		30				
	Lactation 0-6 m		+600		30				
Infants	6-12 months	5.4	+520	1.16 g/kg/d	30	1200	21	12	30
	0-6 months		92 kcal/kg/d		-				

6. Design Considerations

Understanding the User

Stating that the target user is a 20-something student residing in IIT Bombay campus is not enough. There are various kinds of subdivisions even within this group:

- Students who are health conscious and actively seek aids to keep healthy.
- Students who want to be health conscious but are unable to do so because of some constraints.
- Students who are not bothered about their health at all.

The primary research shows that most students claim to be health conscious and feel a need of healthy food options in the campus. Many believe that mess provides enough healthy food.

Food Options within the Campus

The eating options in the campus are many. However it is not difficult to track the menu of most of these places.

- There are a total of 12 hostel messes in the campus. The messes have their mess councils which make sure that the menu meets certain nutritional standards.
- Almost all the hostels have their own canteens which have more or less the same menu and same prices. They run up to 3 am in the night.

These are where most of the midnight snacking(read unhealthy eating) takes places.

- There are restaurants and cafes like Gulmohar, Brew & Bites, Campus hub, etc.
- There are department canteens which essentially serve tea and snacks.

What is already there?

- Most students in the institute own smartphones. Almost everyone is tech savvy. A solution oriented in a smartphone is not an unreasonable idea.
- Students have the option of going to any mess they want if they are willing to pay for the meal. It is noteworthy that they have already paid for the food in their own messes.
- Students often feel a need to know their mess menu before leaving for lunch and dinner. This is especially common among PhD and masters students who have heavy work routines. Often distance from their hostels or lack of time deters them from going to their own hostel mess. In such a case, they often eat in cafeterias, or messes that are closer to their departments.

Design Idea 1

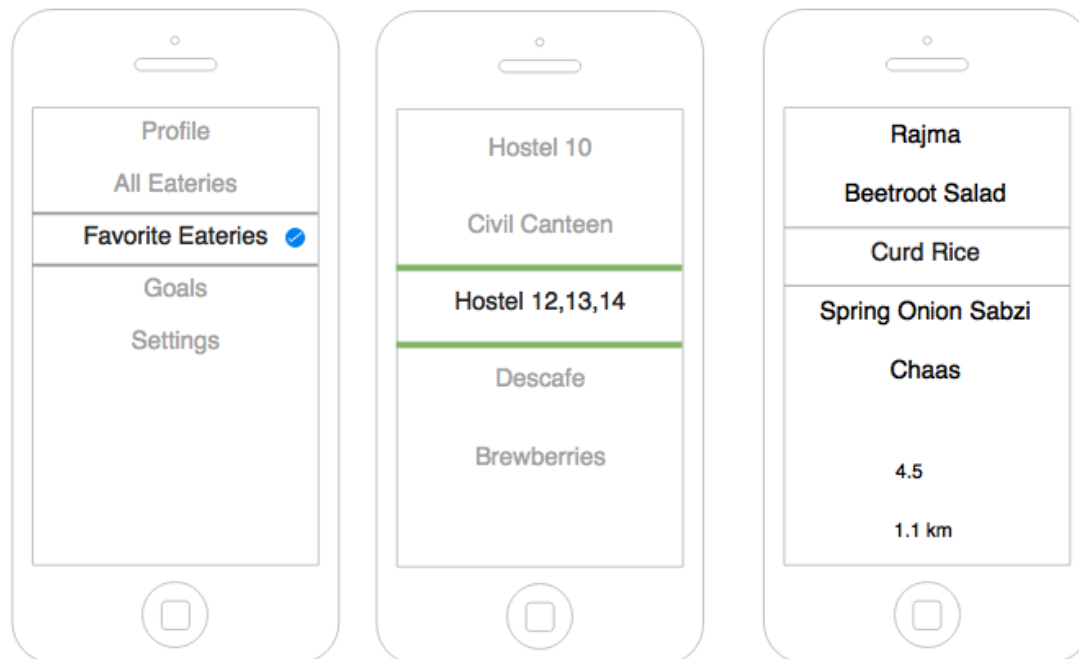
An Application that suggests healthy food options in your proximity

The app takes up your most preferred eating joints: the mess, canteens, etc.

It asks for your favorite food and comfort food.

It takes your BMI into consideration.

Based on the above it suggests you the healthiest possible option for your meals.



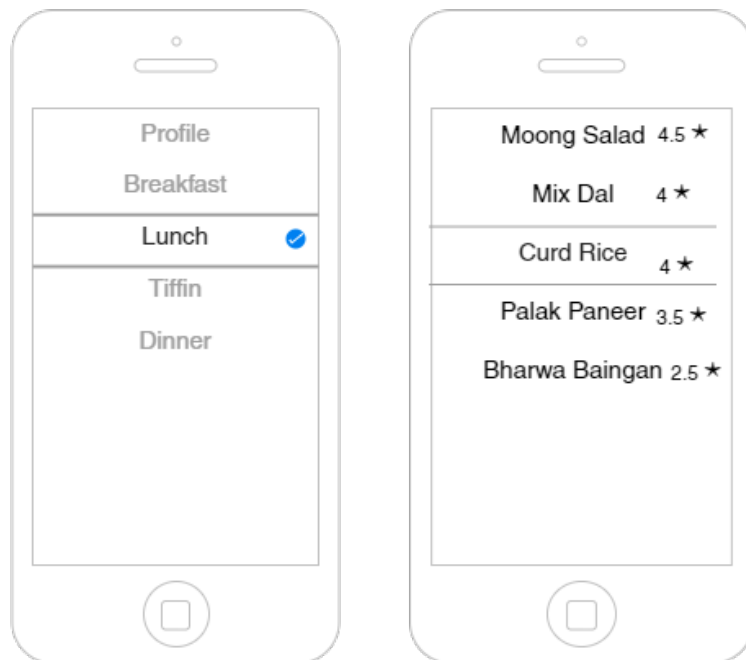
Design Idea 2

An Application that lists down your mess menu according to a “healthy merit list”

The app takes your BMI and health goals into consideration.

It lists down the menu according to the most relevant food items for the user; ie according to her health requirements.

It gives a notification around the mess timings.



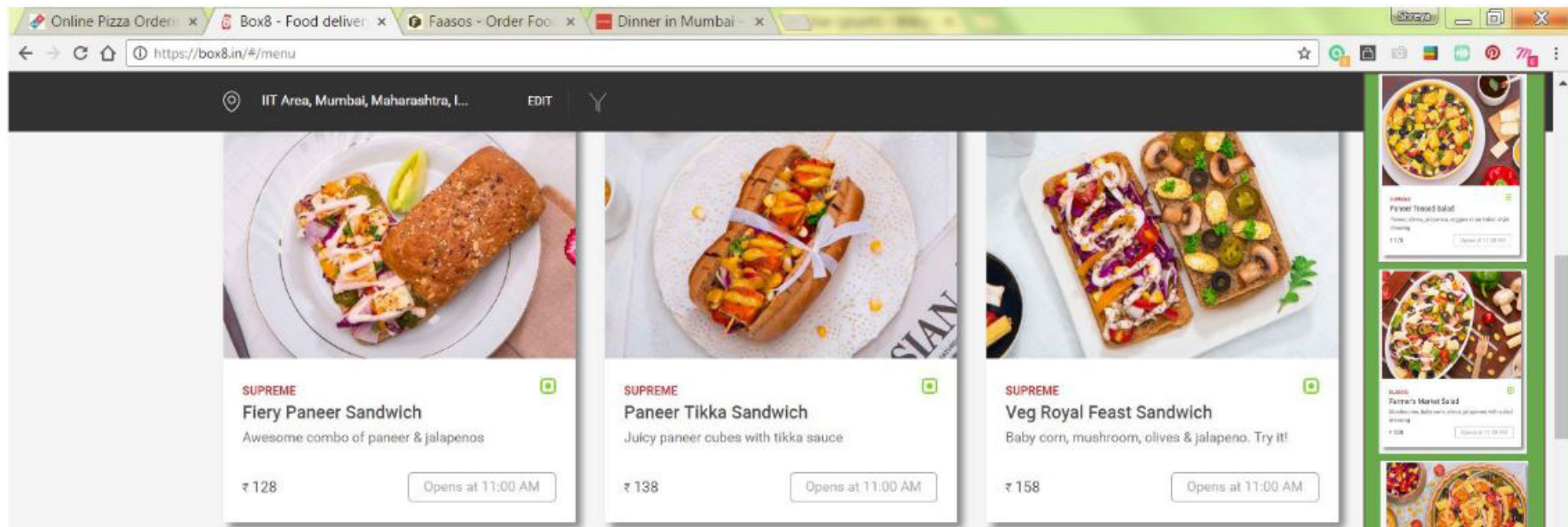
Design Idea 3

A Web Extension that can filter the healthiest food choice when you order food online

The Web Extension runs in the background.

If you are browsing through, say 3 different tabs, the extension would read your choices and suggest you the healthiest choice.

It works much like your e-shopping web extensions that suggest you the cheapest deals.



7. Final Design Idea

The final design idea comprised of a combination of Design Ideas 1 and 2. It is a mobile application that helps you find healthiest food options in your vicinity. It takes into account your BMI, specific nutritional requirements if specified, comfort food.

The idea is chosen due to the following considerations:

- Many students want to look at their menus while deciding where to have their major meal of the day i.e lunch and dinner.
- The point where they are scouting for food is where the intervention can be made to modify their decision making.
- Most people eat canteen food on a regular basis, which are also their most unhealthy meals. Choosing better options from the given list of canteens can prove to be beneficial.

The Database Formation

In order to suggest healthy options it is vital to collect the the data of all the food item available in the campus.

The menu menus of all the messes and canteens were collected from hostel websites and canteens.

The nutritional breakdown of all the food items in terms of proteins, fats and carbohydrates was made.

If a particular food item is rich in something specific, then that was also added to the food attributes.

Since the canteens have almost consistent menus and messes too have similar menus, the database would not be as large as was anticipated.

Suggestion of Healthy Option

As mentioned earlier, the suggestions are being made primarily on the basis of the BMI of the user. The height and weight ratio would suggest if the user is overweight, underweight or is of normal weight.

The amount of carbs and fats have a major say in healthiness of a body type. While an overweight body would require a low carb and low fat diet, an underweight body would require a high carb and high fat diet. The fat intake, however, needs to have a safe upper limit for ALL body types.

There are other variables that would determine if a food item is healthy or not. For an underweight user with higher blood sugar level, a high carb diet would not be recommended. In such a case it become vital for the user to record their blood sugar levels with the app.

Similarly, if someone is allergic or is deficient of some nutritional requirement, it needs to be recorded for accurate suggestions.

Defining the Parameters

The parameter were divided into three categories:

Definitely needed for a sign up-

Body Mass Index (BMI)

Vegetarian/Eggetarian/Non vegetarian

Comfort Food

Age & Gender

**Recommended in Case of Disease History or
Specific Nutritional requirements-**

Blood Sugar

Haemoglobin

Blood Pressure

Recommended for Higher Accuracy of Suggestions-

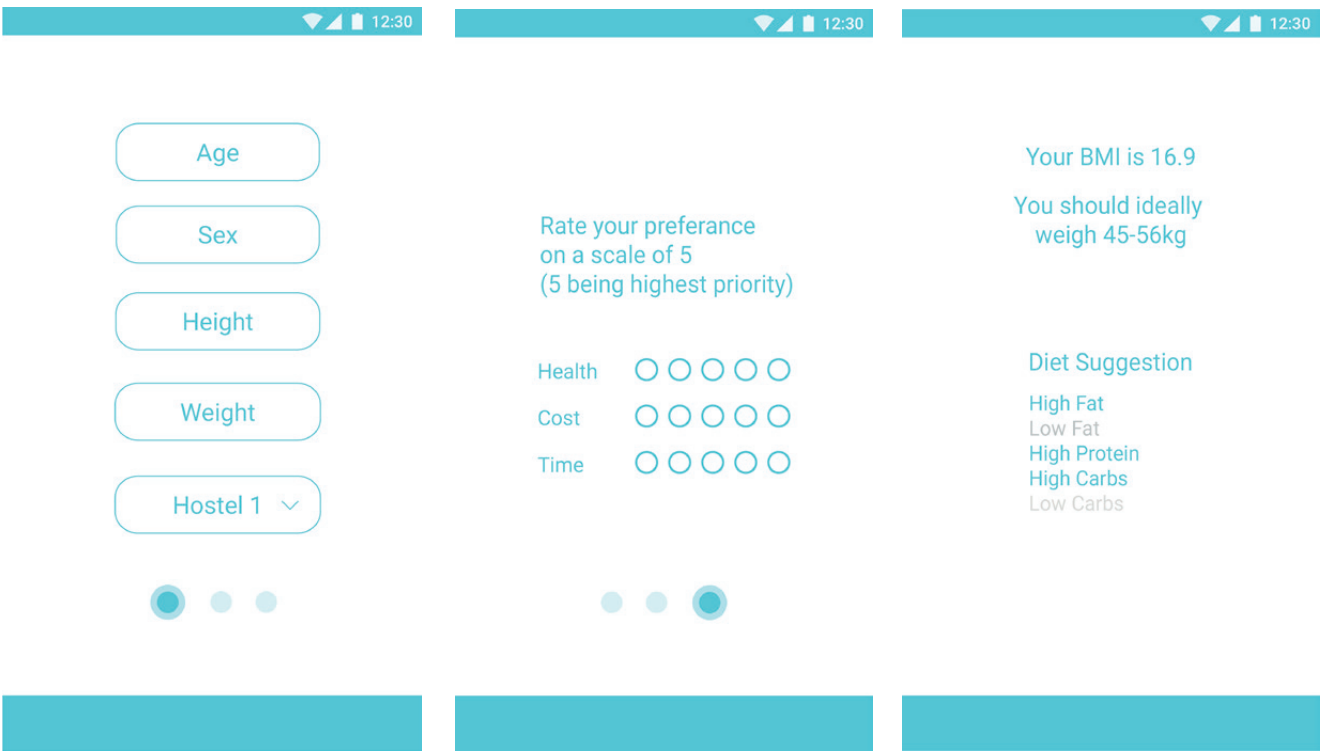
Food Intake

Activity Pattern

8. Design Walkthrough

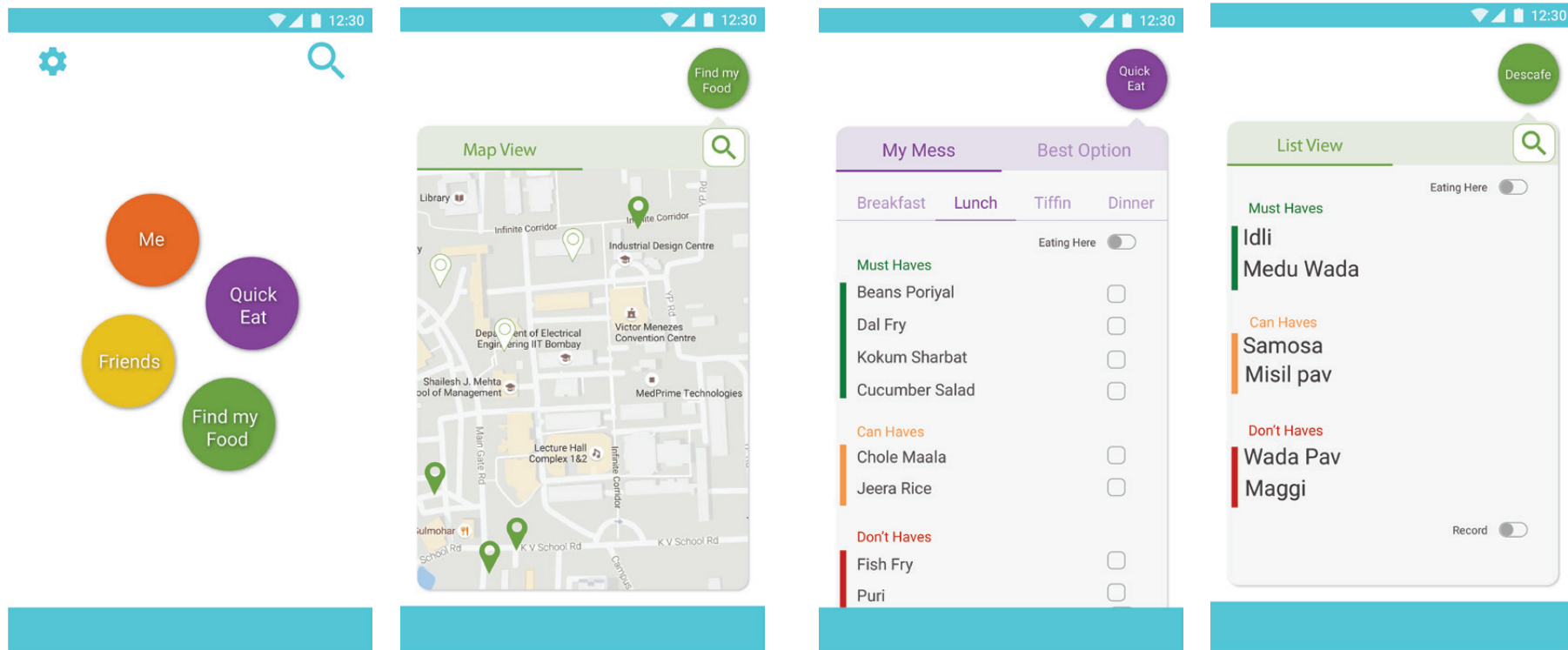
Scenario

A person with a low BMI needs to put on weight. She would seek food items that are rich in carbs and fats. She mentioned a low haemoglobin level in the sign up stage of the app.



She is seeking food option during lunch break when she is in her department. The app shows her a campus map which enlists her nearest food option with the most frequently visited place highlighted for better visibility.

The app also has a shortcut for her on mess menu in the “Quick Eat” option as she had mentioned it in the login stage. Suppose she chooses to eat in her mess and she clicks on the mess menu.



The lunch items get enlisted her in the order of healthiness that is with respect to her BMI. If she has enlisted her haemoglobin level and/or blood sugar levels as well, then the suggestions get further refined.

The menu gives ranking to the most appropriate food item which she should definitely consume (in this case, iron rich). It would also point out food options that are unhealthy and must be avoided.

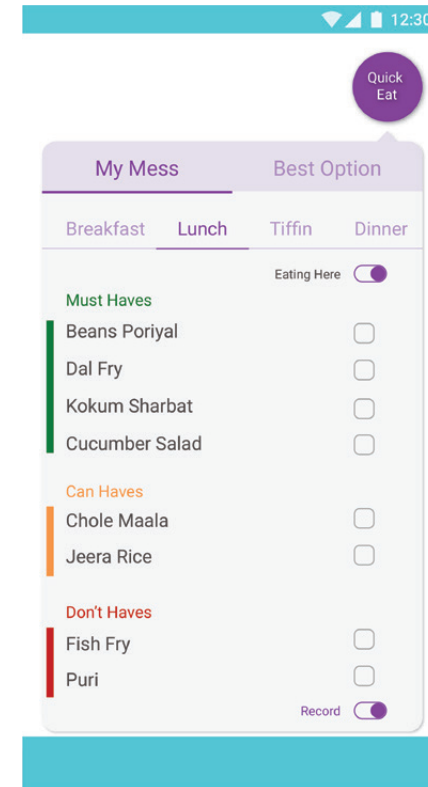
However, the best option would suggest an option that is nearest to her as she gives time more preference than cost.

At the login stage it was asked from the user to weigh health, time and cost on a scale of five.

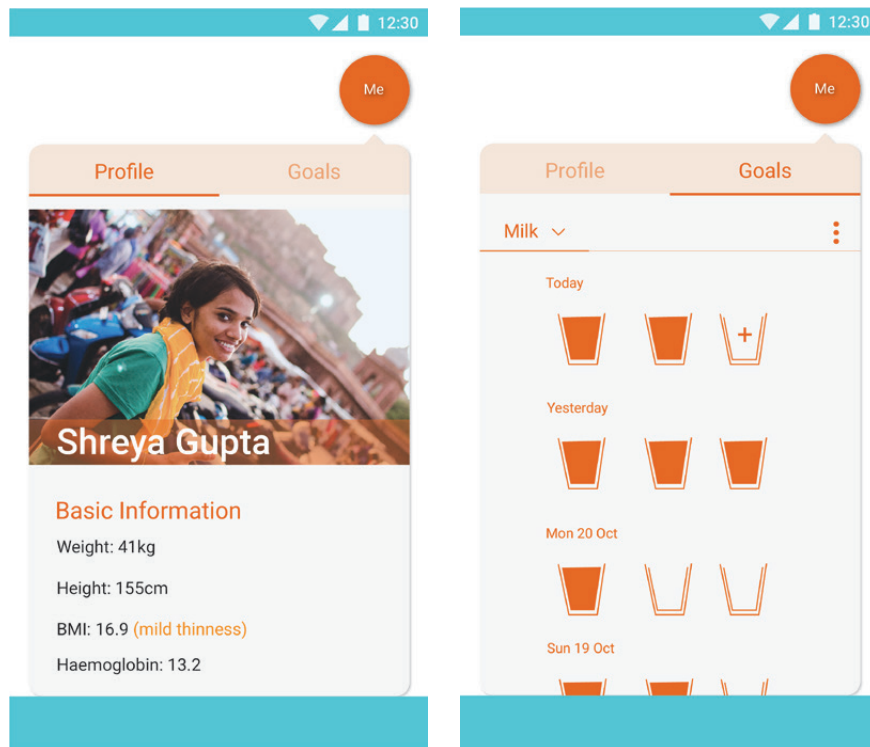
In this case the user has given health and time more weight than cost and hence the best option feature an eatery that is nearest to her. Had she given cost a high priority, the best option would also be her mess since students have already paid for the mess.

Additionally, the user can long press on a particular food item to understand its benefits. She can also turn on the “record” mode to keep a track of her meals by tapping on check boxes.

Her profile page would have the information she provided at the login stage along with her personal goals. The user can have multiple goals such as improving milk, water or fruit intake.



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9. Evaluation Method

The design was tested for its relevance of menus.

Five students were taken as the experimental group and five students as the control group.

The experiment group was sent the image of the designed menu during lunch for 3 days with each member getting a customized menu on the basis of their BMI.

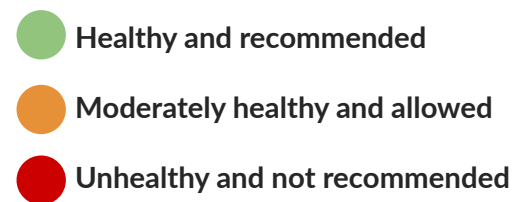
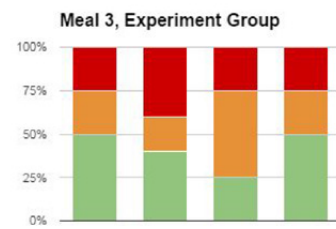
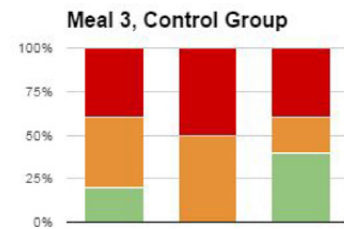
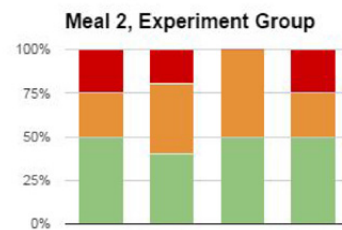
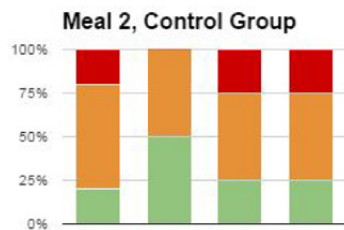
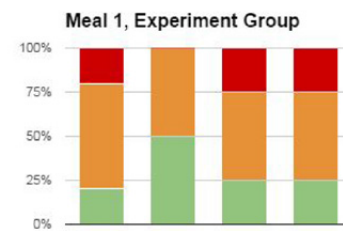
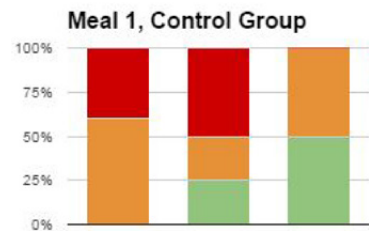
The control group a sent the regularly listed menu image.

The intention was to understand if the experimental group is making better choices now that they know what is healthy and unhealthy for them.

MEAL 1	MEAL 2	MEAL 3
Chana Dal	Arhar Dal	Dal Fry
Rasam	Methi Matar Masala	Gobhi Matar
	Sambhar	
Kadhi	Aaloo Gobhi	Curd
Bhindi Fry	Curd	Chole Masala
Buttermilk		
Kadhai Paneer	Lemon Rice	Mango Rasna
Masala Rice	Mushroom Chilly	Veg Pulav
		Puri

Mess Menus for Test According to Healthiness

Test Results



Key Findings

- On being asked if the food suggestion affected their choices even in a slight way, almost all of the participants said that it did.
- Experimentees said that they tried avoiding the food from the "red category".
- There was no pro-active effort to eat from the "green category" by almost half the attendees.
- Most of the choices were made from the "orange category".

What Worked

- The clear division between "must haves" and "don't haves" was found to be very helpful.
- The idea of having all the menus on one platform was received well.

What did not Work

- The lack of quantifying the intake is affecting the accuracy.
- The floating action button, serving as a chat head is revealing negative results in heuristic evaluation.

11. Bibliography

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