

FitCulture

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Problem Statement:

1. The problem we are trying to address is to help fitness enthusiasts/ athletes to track both their physical activities and their food consumption accurately.
2. Staying fit just doesn't mean exercising regularly, following proper diet is equally important.
3. It is essential for people who are strict about to stay fit having the right diet. With proper monitoring about the calorie intake and burnt one can achieve the results desired.
4. Without these monitoring capability one would only have to go about making guesses about the calorie burnt or food intake, which can be off by a very high margin.
5. As per the data collected from Survey-Monkey, there are approximately 14 million people just in US that are using fitness app and devices take care of their fitness. This shows the significance of people worried about their fitness. [\[1\]](#)

Related Works:

Currently there are many health and weight monitoring apps which helps us to monitor our daily activities and food consumption.

Here we would like to discuss two variants of these, wearable and non-wearable.

Non-wearable :

Example: Noom

1. With help of pedometer in mobiles, it calculates number of footsteps to check calorie burnt.
2. Some apps also provide option to add the exercise/ physical activities performed.
3. These apps allows the user to track calorie consumption. This feature requires the user to manually enter the food he/she has consumed.

Wearables:

Example: Fitbit, Garmin

1. Uses several sensors to monitor our physical activities.
2. It can be used to measure our heart rate, calories burnt and also our sleep quality.
3. Some devices also provide means to specify exact activity being performed, such as swimming, jogging etc.
4. It also helps us log in details of the calories consumed. This is done manually by the user.

The current solution helps us to monitor physical activities as well as food consumption, but it lacks in accuracy.

Category	Physical activities	Food Consumption
Non-wearable	Poor accuracy	Poor accuracy
Wearable	Accurate	Poor accuracy

As shown in the above table, none of the current solution help us monitor diet/calorie intake accurately. This is due to the fact that it relies completely on user to enter multiple information about the food consumption.

User to update their dietary information, they need to choose the food which is available in the apps database, which most of the times could be a limitations.

This might be misleading as user might forget to enter all the details. In a long run, users tend to get frustrated to fill in all the details about their food consumption.

Proposed Solution:

The game changer in this fitness monitoring domain could be a new technology which can help user track his/her calorie consumption more easily and accurately, which was lacking in the previous/existing solution.

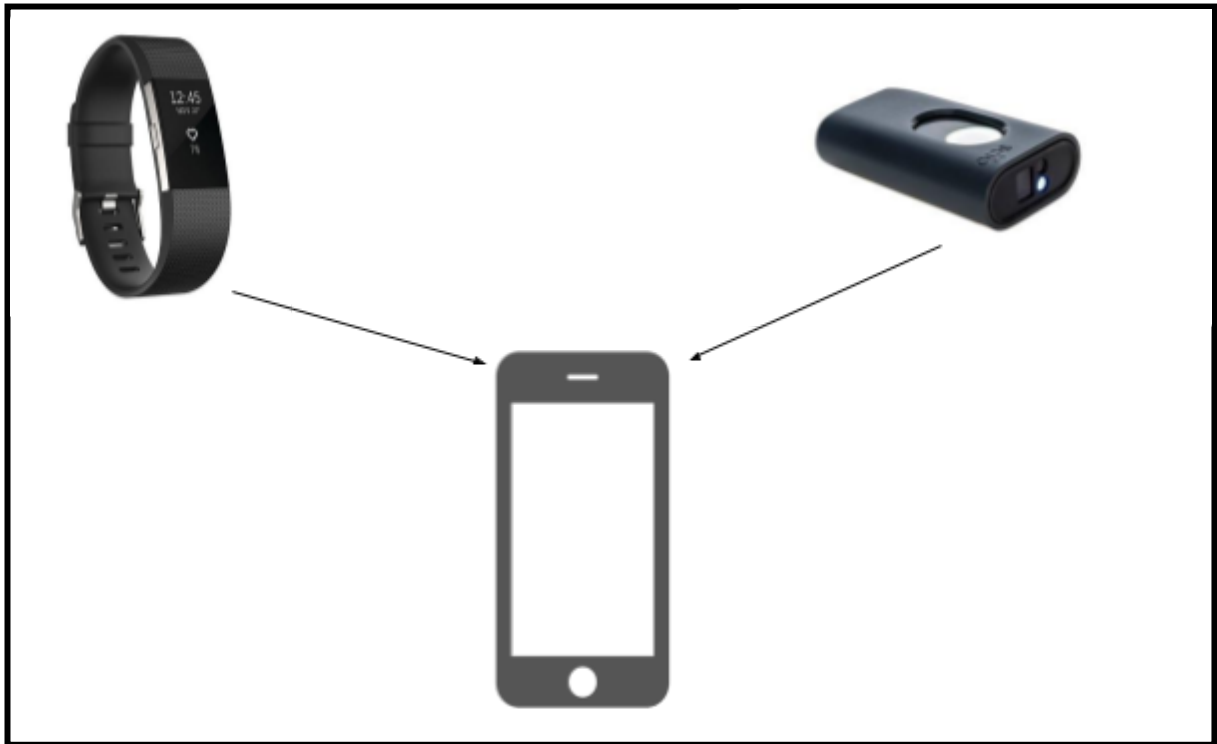
Due to the tremendous developments recently in sensor technology, making it possible to track the dietary consumption of the user.

Hardware requirements:

1. Smart Phone
2. FitBit : \$100
3. SCIO molecular sensor [\[2\]](#): \$300

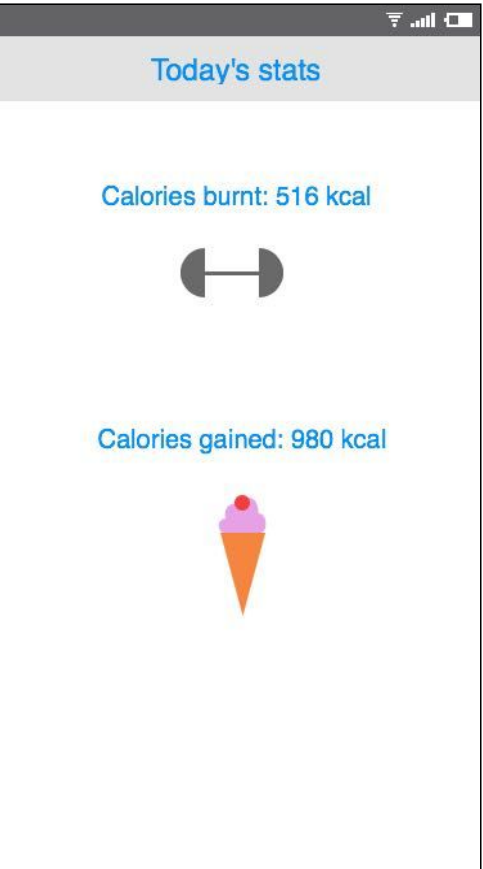
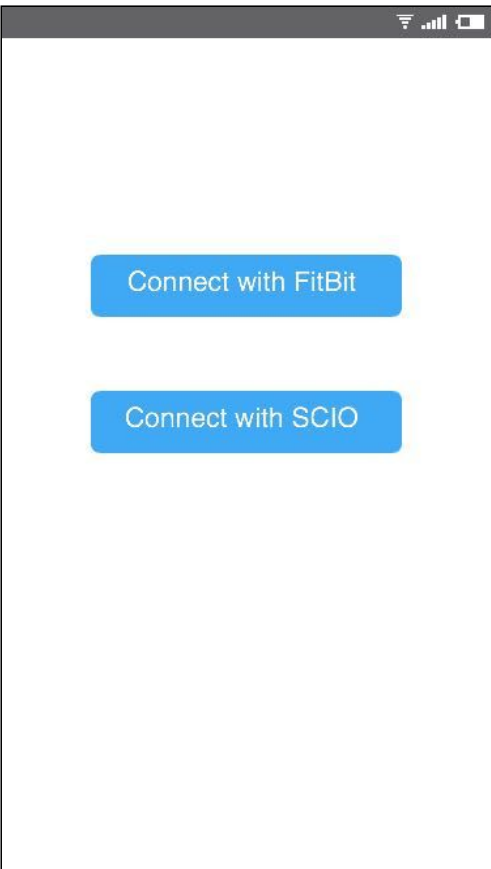
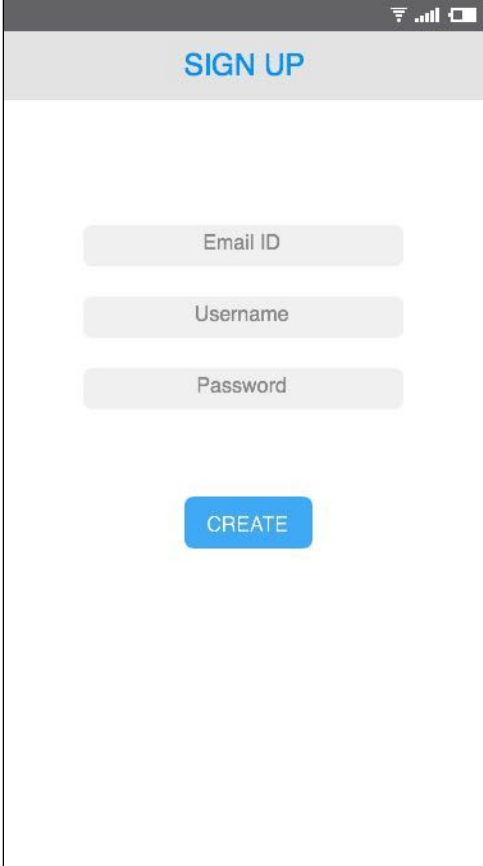
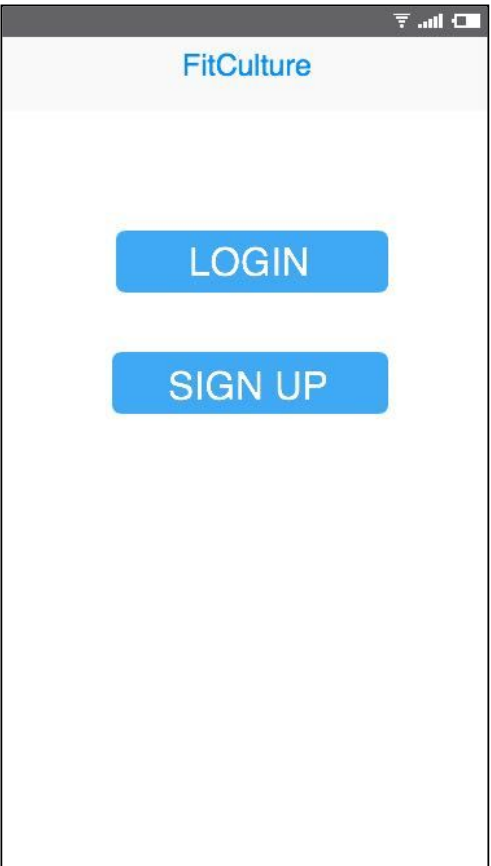
In our solution, we are introducing the new hardware i.e SCIO molecular sensor. This device sets apart our solution from existing ones. It makes it possible to track our calorie intake both easily and accurately. A simple scan of the food item by our device allows us to gather information on the number of calories present in the dish the user is consuming. This method does not require much effort from the user as well as it is easy to use. The way the SCIO sensor works is that it uses near-infrared spectroscopy to identify the food's molecular content by capturing the items spectral fingerprint. Each type of food item has a unique spectral fingerprint. Once you scan a food item in your dish, SCIO's signal processing algorithms will compare the spectral fingerprint against the SCIO database. Once it finds a match it returns the calorie content. This requires the SCIO database to be updated on a regular basis. The SCIO is still growing and there's also an SDK for third-party developers to develop apps that leverage the sensor's capabilities.

The link that is provided above is off the stand alone device which can be used with the smartphone, it has also been incorporated with a smartphone which makes it far more easier to use our product as the user will not be required any extra device. The other device that is incorporated in our solution is a wearable Fitness Tracker such as the Fitbit. Our solution focuses mainly on the fitbit as 57% of the wearable fitness device market is captured by Fitbit. Another reason for us choosing Fitbit is that it has several services that helps us to use the data it collects on the user. Using these two devices, we can accurately log the user's physical and dietary data.



The crux of our product is our app:

1. We can build our app using SDKs provided by Fitbit and SCIO to procure the data collected from the respective devices.
2. The data on physical activities is taken from the Fitbit and contains information on how active the user is, the amount of calories they have burnt, their sleep patterns as well as their heart rate.
3. Based on the BMI index provided the app sets a target weight or allows the user to choose if they want to gain or lose weight and customize their own target weight.
4. The data from the SCIO gives the exact amount of calorie they have consumed all day.
5. Using this information we can plan a diet based on the User's workout schedule.
6. The app creates a diet plan by setting targets for the user in term of number of calories, amount of carbs and amount of proteins. The information from the SCIO device helps us track the food the user consumes.
7. Using the SCIO we can check the amount of protein or carbohydrates the user is consuming. This data is utilized by our app to check if the user is meeting the diet plan set by the app or not. It could alert the user if its exceeding the target or if the user is achieving the targets as required for his physical activity.
8. We also plan on using a suggestion feature in the app to inform the user which food he can consume to help him meet the dietary goals set by the app.



Evaluation methodology:

To evaluate the product/design, we choose 30 participants aged between 18 to 35, fitness enthusiastic such as athletes or people who regularly visit the gym.

We would like to conduct the evaluation for period of 30 days, evaluation broken into three phases. Each phase is conducted for the time period and of 10 days.

For phase-1 we ask participants use Noom app. We choose Noom app as it popular among non-wearable fitness tracking, with more than 10 million downloads in android app store alone.

For phase-2 we will provide the participants with a the Fitbit device to track fitness schedule as well as their diet. As mentioned earlier that among Fitness wearable devices the fitbit is the most popular.

For phase-3 the participants will be used to our product.

The reason for us splitting the experiment into three phases is so we can valuate our product against the existing ones. The first two phases helps us evaluate the existing solutions that are most popular in their respective categories.

We would conduct our survey after we have completed all the three phases. The reason we are conducting our survey at the end is because we will list ask the participants to rate their experience against certain metrics. If we were to survey them after each phase, it would make them more alert to the metrics we are focussing on and this might make the results of the remaining two surveys biased.

Before the start of each phase we will train the participants on the usage of the respective device/app required for the phase.

We are conducting this experiment to evaluate our solution against three metrics. They are accuracy, ease of use and on how the conviennent the product is. We have designed the questions into three parts to help us achieve our goal.Each question was was supposed to be rated from 1-5. One being very poor and five being Excellent .

Following question were asked to the participants:

1. Please rate the three phases on how easy were they to use to track their physical activity and
2. Please rate the three phases on the accuracy of the results shown by them in terms of tracking your Physical activity.
3. Please rate the three phases on the accuracy of the results shown by them in terms of tracking your calorie intake.
4. Please rate the three phases on how easy it was to use the product to measure their calorie intake.
5. Please rate the three phases on how convenient the product was i.e. in terms of how easy it was to carry the device around.

The surveys will help us gauge on how the overall experience of the participants using the various products. Once they complete all three phases they will be in a better position to compare the products against each other. We felt the last question was very important for our evaluation as our solution had an extra device i.e. the SCIO sensor to scan the food

items. The success of our device depends on this as our product although accurate and easy to use, it requires user to carry an extra sensor device.

After the survey we will also put forward objective question to the participants to get feedback on how they felt using our product. The goal of our objective questions is how likely the participant is willing to pay \$400.

Price doesn't seem outrageous as there many smart wearable devices which are more expensive.

The price can be less if the user already possess a Fitbit device, now they only have to spend money just to buy the SCIO device.

Currently there is a smart phone which already has the SCIO device inbuilt which makes our product more convenient to use. I have provided the link to the product. [3]

We hope in the near future more smartphones will come incorporated with the SCIO or such molecular sensor, this will be really beneficial for our product.

References:

[1]https://medium.com/@sm_app_intel/these-fitness-app-statistics-show-whats-going-right-and-wrong-for-fitbit-da2c4c3be142

[2]<https://www.consumerphysics.com/myscio/scio/>

[3]<https://www.phone.consumerphysics.com/>