

Phaze

User Manual

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1. Introduction

This is a detailed user manual on the Phaze mobile application. This manual will inform the users on the problems the Phaze application plans to tackle, technical and non-technical details on how our software works, and maintenance and safety considerations for users. Only section 11, technical specifications, of this user manual, will require basic knowledge of mobile hardware and software.

By the end of this report you will be able to:

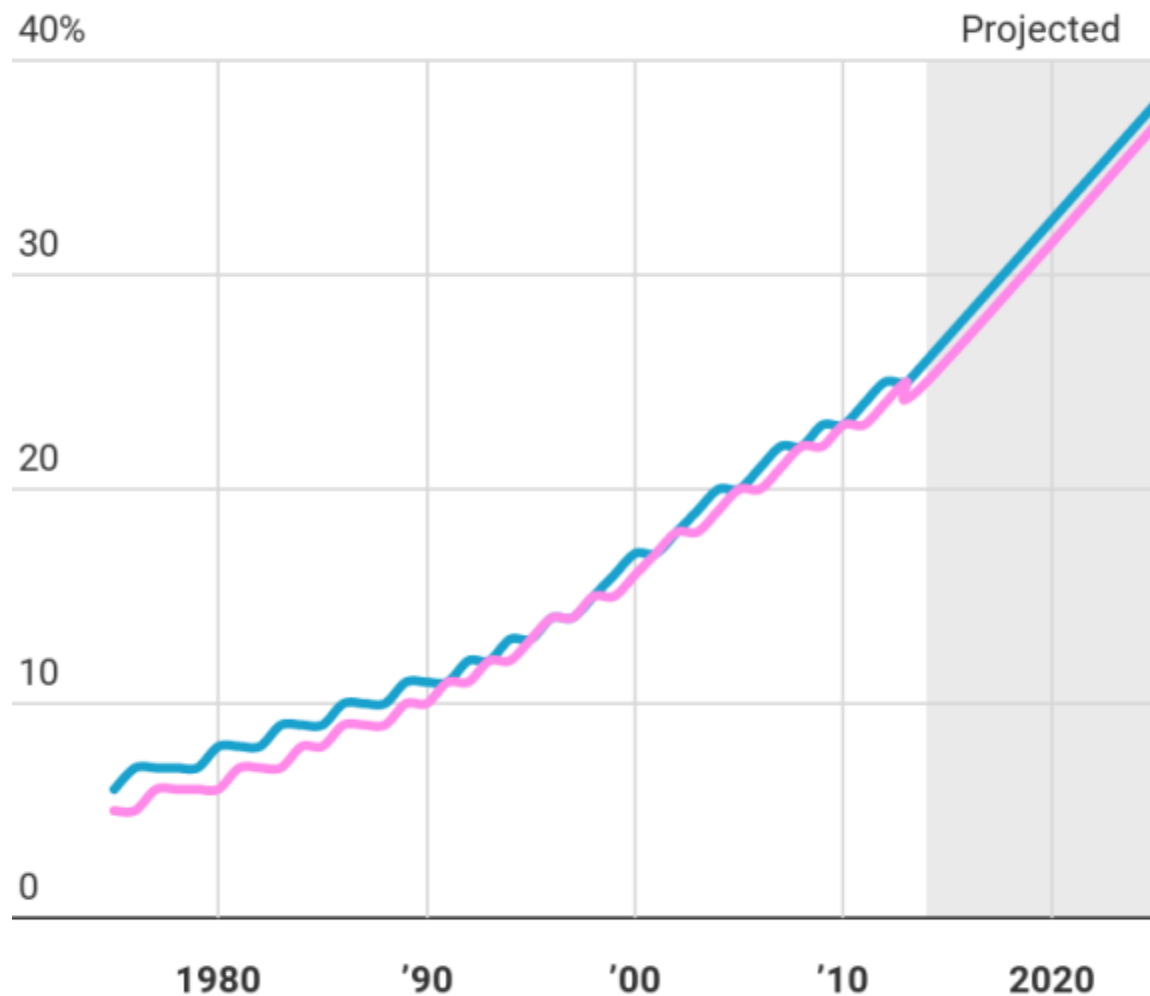
- Understanding the problem Phaze is tackling.
- Understand the purpose of all the features Phase application.
- Understand the layout of the Phaze mobile application.
- Understand how to install the application.
- Understand how to use each feature.
- Understand how to deal with problems when they arise on the application.
- Understand how to maintain the application to keep your phone and application healthy.
- Safety consideration for the user when using the application.

2. Intended use

The Phaze application is intended for the general public that wants to improve their fitness and well-being by tracking their micronutrient food intake and calories burnt. We want to tackle the growing problem of obesity in Ireland which is more evident than ever with COVID-19 restricting people's movement to exercise. Over the last forty years in Ireland obesity has been growing consistently from 5% of the Irish population in 1980 to around 30% in 2020 as seen in the graph below.

Percentage of population who are obese

■ Men ■ Women



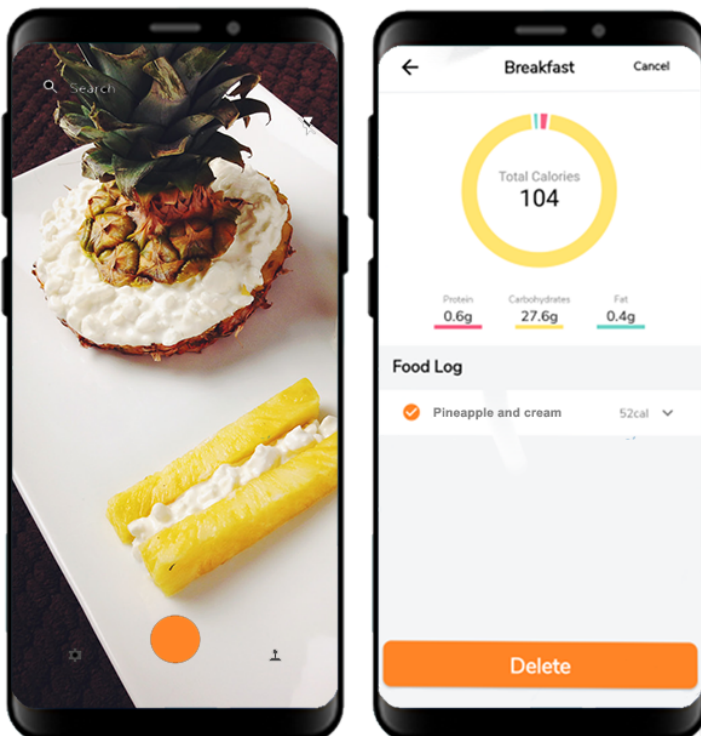
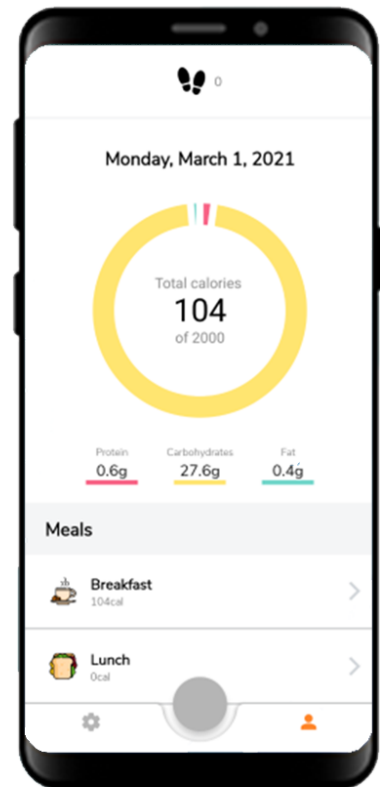
Inspired by this research the Phaze team decided to use education as the solution to this problem. Our application provides users with all the micronutrient information that they need to reach their fitness goals to lose, maintain, or gain weight. Allowing users to make more informed decisions on their dietary choices.

3. Features

Mobile App

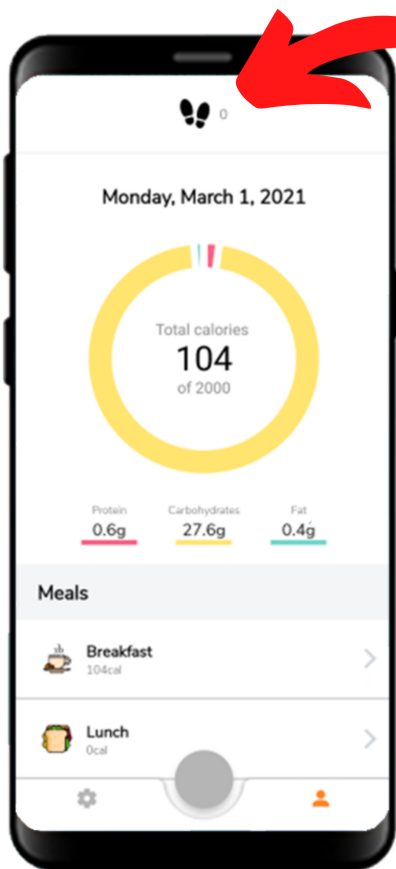
Micronutrient Breakdown

This feature provides users with micronutrient information, such as fats, sugars and proteins, based on the searched food. This feature will quickly inform users on the food's nutrition allowing the users to make healthier choices in their eating habits.



Food identification

This feature allows users to identify the caloric and micronutrient information of food by simply taking a picture of the food. Our software will identify the food and display the macronutrient breakdown to the users making it quicker and easier to get information on unlabelled food items.

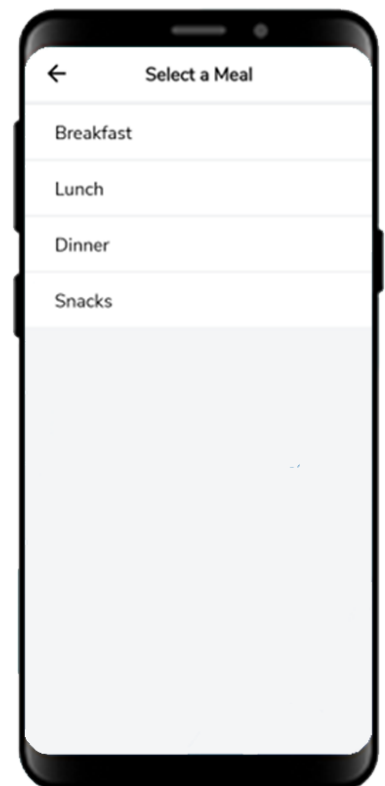
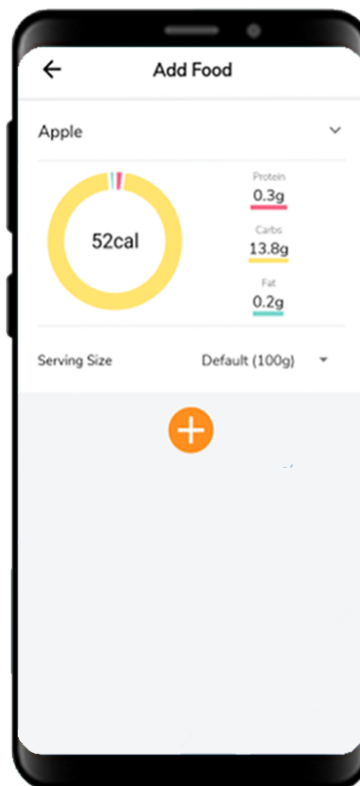


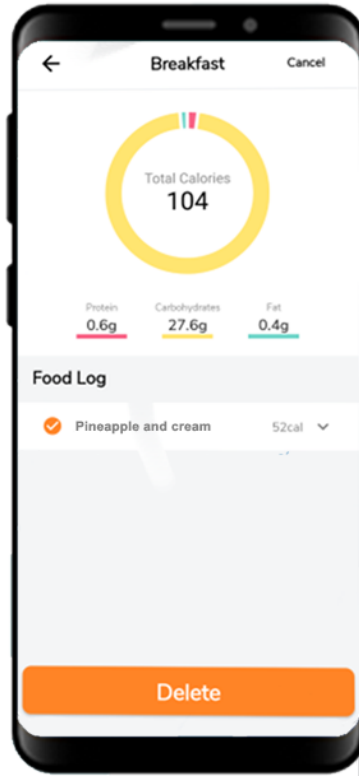
Foot-step counter

This tracks the activity of the user by counting the number of footsteps of the user. The footsteps are then converted into calories and displayed to the user so they can eat more or less depending on their fitness goals.

Food Diary

This feature allows the user to track the foods they have eaten for breakfast, dinner, and lunch every day, week, or month. In the food diary, we provide a breakdown of caloric information to the users for each section. Helping users to keep track of their dietary habits.





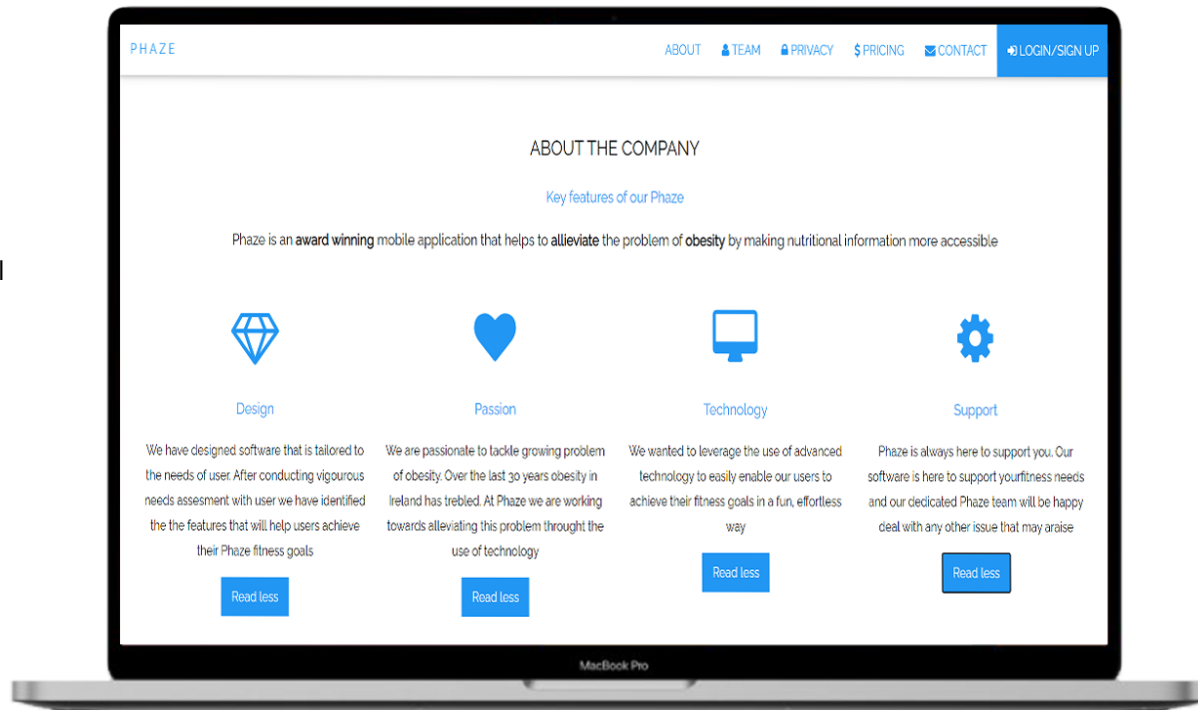
Barcode Scanner

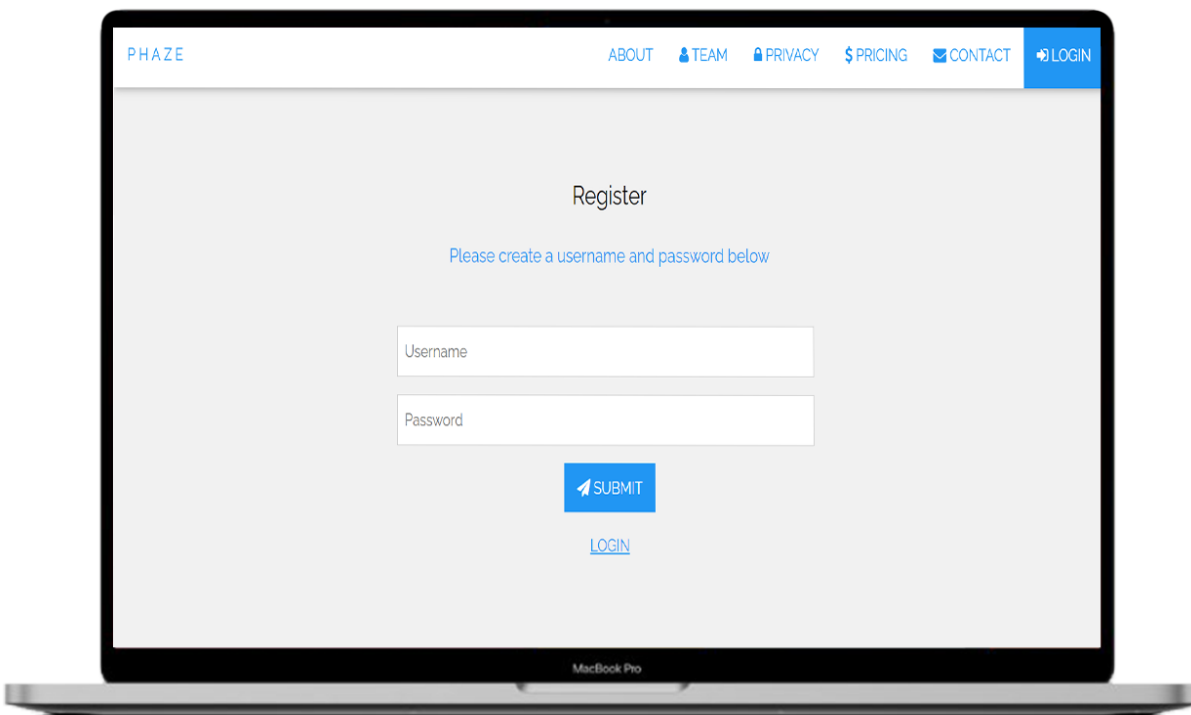
This feature enables users to easily access micronutrient information on packaged food. The user has to simply take a photo of the barcode and the Phaze app will retrieve the information on that product. Place the dietary information at the user's fingertips.

Website

Find Out More About Phaze

The Phaze website is the focal point for our user to find out more about Phaze, the founder, our privacy policy, and how to contact the team.



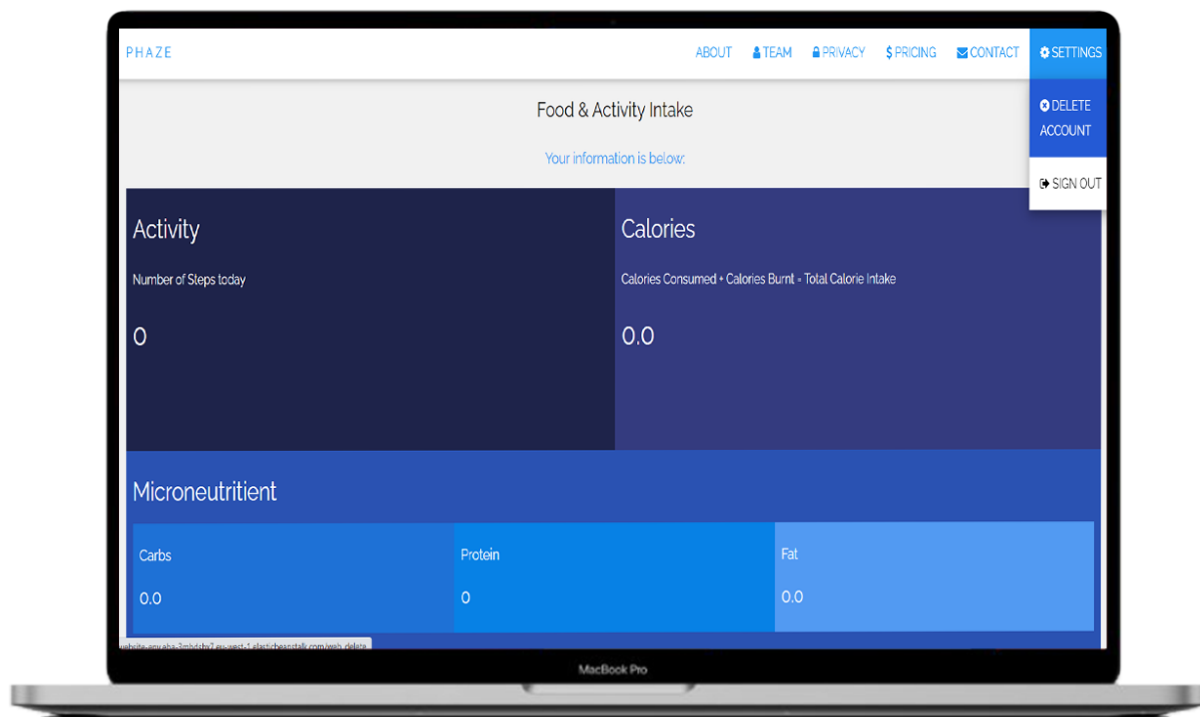


Manage Your Account Anywhere

We want to give you complete control over your account so we have developed a login, register and delete feature that lets you manage your account anywhere and anytime.

Check Your Activity and Food Intake Anywhere

Forgot your phone? No need to worry as you can now access your micronutrient and activity intake through our website. Giving you access to your food intake anywhere.



4. Description of the user interface

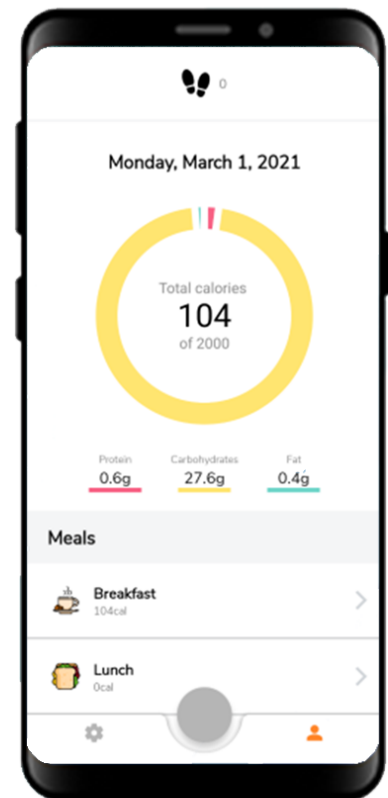


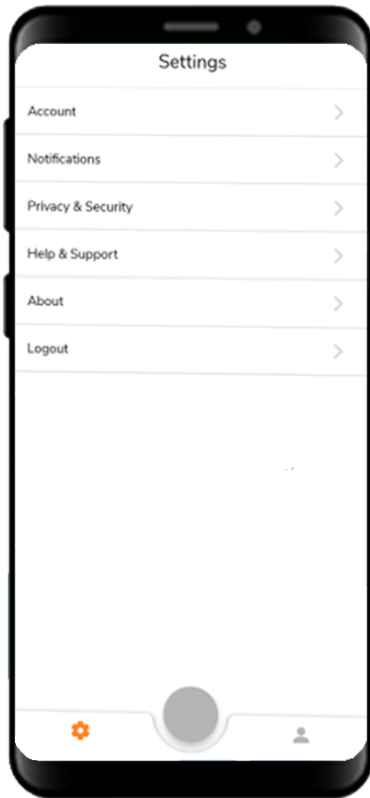
Mobile App

The user interface was designed to make the user experience as simple and straightforward as possible. We wanted to have all of the functionality of the application available to the user from the start, with a small learning curve. Upon opening the application, the user is prompted with a Camera View page, as seen on the image on the left, which controls the capturing of photos and searching for food in the search bar above.

The bottom navigation bar is used to display the other pages that the user can access, the gear symbol on the left is the settings page and the person icon on the left is the Food Diary page.

The user page is the main area where user information is stored, such as nutrition information, meals eaten, and step counter. The food nutritional information is displayed using a pie chart and is colour coded with its respective micronutrient value. This is visually appealing and simple for the user making it easier for users to make more informed decisions on their eating habits.



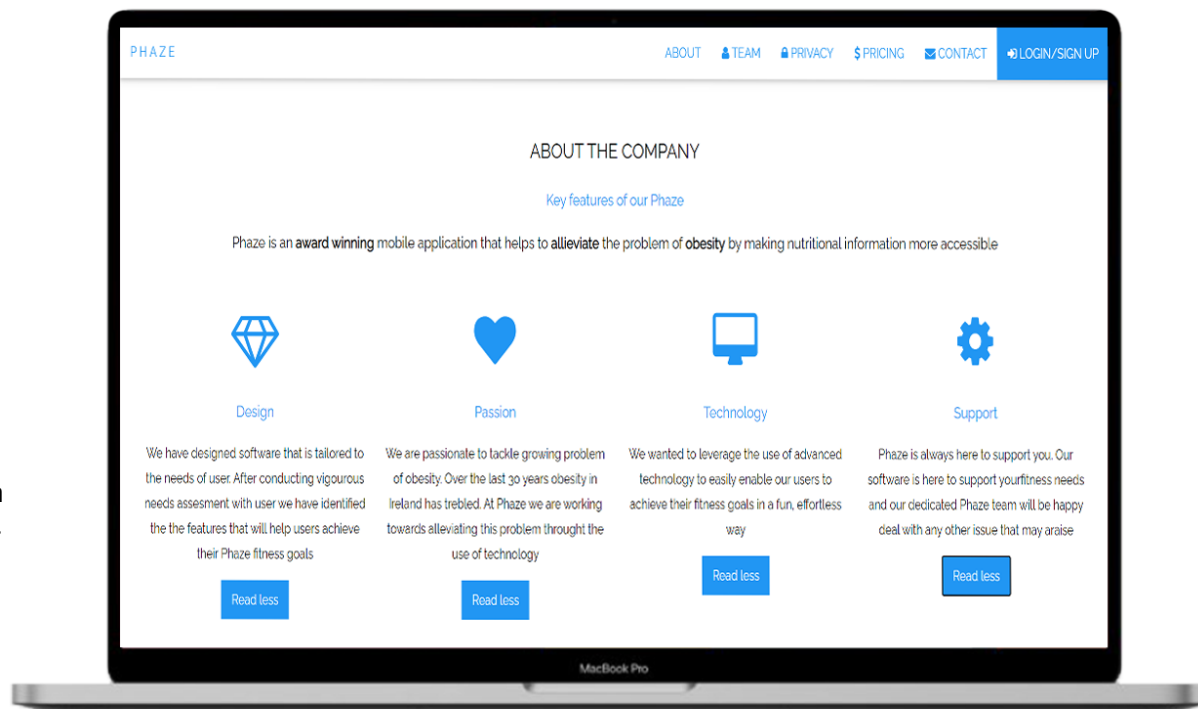


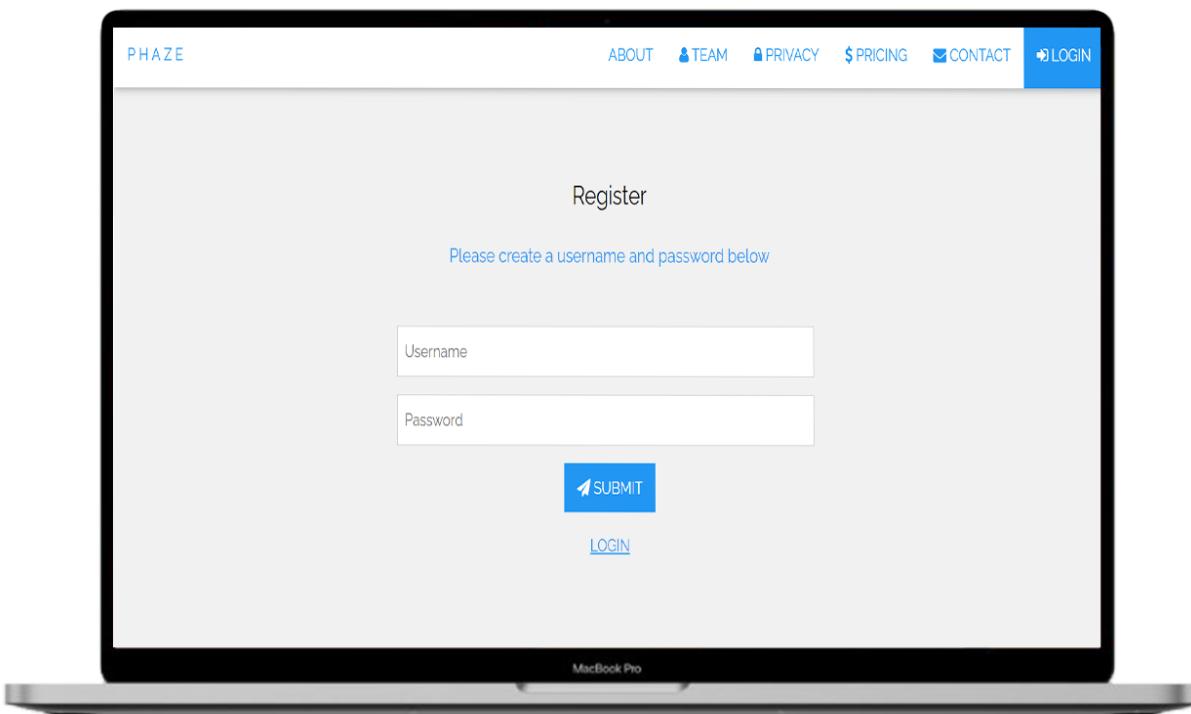
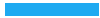
The setting page contains a variety of information as seen on the screenshot on the left.

- **Privacy & Security:** This will bring the user to our privacy policy. This page will state exactly what will happen to the information so the users can have peace of mind that our app abides by EU Data Protection Regulations.
- **Help & Support:** bring our users to our contact page where users can contact us with any queries that they may have.
- **About:** This section will provide more information on what Phaze is and the problems we are addressing.
- **Logout:** will sign the user out of their account on demand.
- **Delete Account:** this will delete the user's account and all information when the button is clicked.

Website

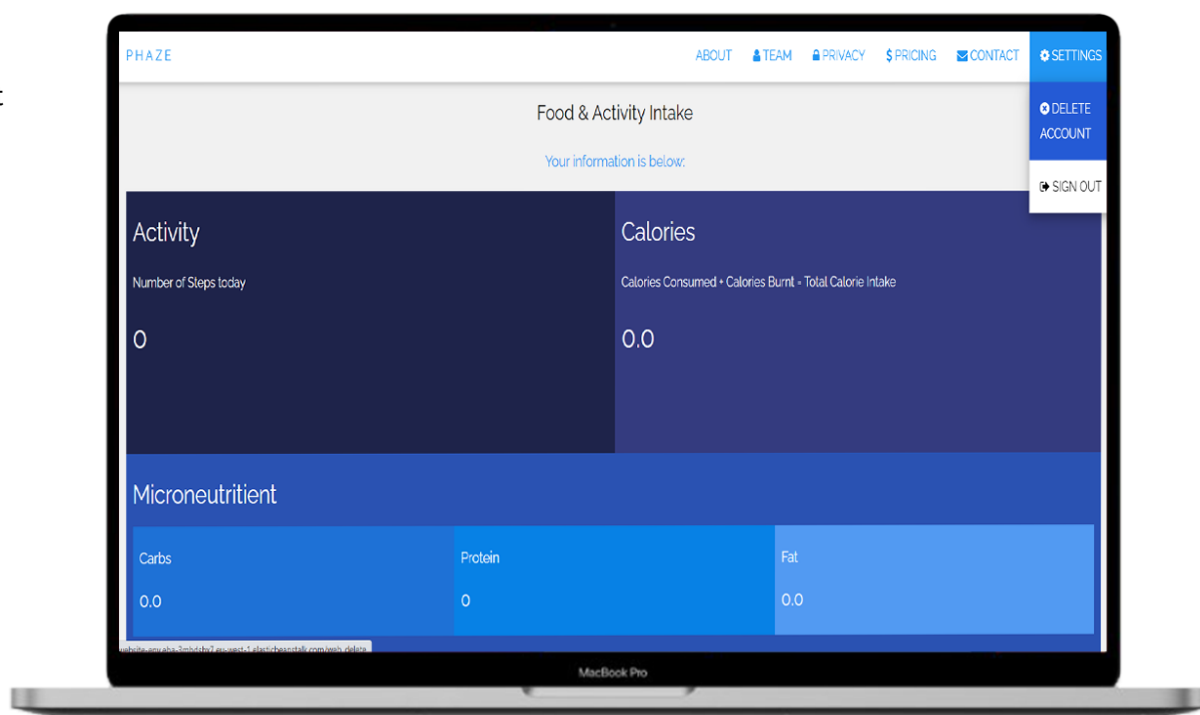
The homepage contains a variety of information that is presented in a clean and user-friendly way. The user can navigate easily from page to page via the navigation bar above. The highlighted blue button for logging/signup will take the user to a login or registration page so they can manage or view their fitness records.





The registration and Login page has the same simple format. Two input fields for the username and password followed by a submit button to authenticate the username and password. If the user already has an account they can either click the link under the submit button or the login button in blue at the top right of the webpage.

It is the user dashboard that has a simple layout providing all the food and activity intake information. The settings button on the navigation bar will drop down to provide two additional options such as delete account and sign out.



5. Installation instructions

Mobile App

To install the application, first search for it on the Google Play Store and download it if there is sufficient space on the user's device. Once it is installed, either log in to an existing account or create a new one using the sign-up option.

Website

To access the web application simply click on the link on any PC or mobile device:

<http://website-env.eba-3mhdshx7.eu-west-1.elasticbeanstalk.com/>

6. Instructions on how to use

Please identify the feature that you intend to use and follow the instructions below. These instructions assume that you have successfully logged into the application and the camera view page has been loaded.

Add a meal using the take picture method

1. Take a picture of the food that you are currently eating. The flash can be toggled on and off if needed.
2. Once the picture is taken, the AI algorithm will determine whether the picture included a barcode or if it is a type of food. This may take a couple of seconds. When this is completed, the meal nutritional information will be displayed on the screen and you can select your preferred serving size.
3. Next, when the serving size is selected, you must then add the food to a particular meal (Breakfast, Lunch, Dinner, Snacks).
4. Your food has been successfully recorded.



Add a meal using the manual search method

1. Tap on the search bar at the top of the camera view page.
2. Input the food you intend to search for and the results should appear below the search bar. Click on the preferred food.
3. Once the food is selected, the meal nutritional information will be displayed on the screen and you can select your preferred serving size.
4. Next, when the serving size is selected, you must then add the food to a particular meal (Breakfast, Lunch, Dinner, Snacks).
5. Your food has been successfully recorded.

View the recorded meal diary

1. From the camera view page, either swipe left or press on the user tab down at the bottom. This will bring you to the user information page.
2. The total calories and macronutrients eaten, along with the step counter and calories burned are displayed on this page.
3. If you want to view what foods were eaten at a specific time, E.G Breakfast, you can select the corresponding section down at the bottom. This will bring you to the user's meal information page which will show what foods were eaten at that time and all of their information such as calories, macronutrients, etc.

7. Troubleshooting to solve problems

Please find the issue you are having with the application and follow the steps below until the problem is solved:

Issue Logging into our account

1. Firstly, please check our website for any update related to major outages of our services.
2. We recommend uninstalling and reinstalling the Phaze mobile application from the Google Playstore.
 - a. Ensure that you are running an operating system greater than Android 4.0 (version Ice Cream Sandwich) and higher.




- b.** Proceed to uninstalling and reinstalling the app. Ensure that you clear your cache and data before reinstalling.
- 3.** If uninstalling and reinstalling the app did not help. Please restart your device by turning it on and off. In some cases, a hard reset needs to be done. Please check your mobile device manual to do a hard reset.
- 4.** If none of the suggestions provided above helped, please contact the Phaze support team here or send us an email at bothkevins@gmail.com.

The Barcode scanner is not working

1. Firstly, please check our website for any update related to major outages of our services.
2. The Phaze app requires permission from your android mobile device to access your camera. This allows us to scan barcodes. If the camera feature is just a black or blank screen. Please go to "Settings" on your device, then tap "Privacy" then "Camera" and allow the Phaze application to access your mobile phone's camera.
3. Once your camera is enabled, please install and uninstall the application before opening the barcode scanner again.
4. If none of the suggestions provided above helped, please contact the Phaze support team here or send us an email at bothkevins@gmail.com.

The food Classification feature is not working

1. Firstly, please check our website for any update related to major outages of our services.
2. The Phaze app requires permission from your android mobile device to access your camera. This allows us to scan barcodes. If the camera feature is just a black or blank screen. Please go to "Settings" on your device, then tap "Privacy" then "Camera" and allow the Phaze application to access your mobile phone's camera.
3. Once your camera is enabled, please install and uninstall the application before opening the Food Classification feature again.
4. If the Food Classification feature is predicting wrong food, please retake the photo to ensure the quality of the photo is good and the food item can be identified.

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5. Our food classification feature can only identify one hundred and one foods. Please check this list to see if your food can be identified by our Food Classification feature.

(Apple pie, Baby back ribs, Baklava, Beef carpaccio, Beef tartare, Beet salad, Beignets, Bibimbap, Bread pudding, Breakfast burrito, Bruschetta, Caesar salad, Cannoli, Caprese salad, Carrot cake, Ceviche, Cheesecake, Cheese plate, Chicken curry, Chicken quesadilla, Chicken wings, Chocolate cake, Chocolate mousse, Churros, Clam chowder, Club sandwich, Crab cakes, Creme brulee, Croque madame, Cup cakes, Deviled eggs, Donuts, Dumplings, Edamame, Eggs benedict, Escargots, Falafel, Filet mignon, Fish and chips, Foie gras, French fries, French onion soup, French toast, Fried calamari, Fried rice, Frozen yogurt, Garlic bread, Gnocchi, Greek salad, Grilled cheese sandwich, Grilled salmon, Guacamole, Gyoza, Hamburger, Hot and sour soup, Hot dog, Huevos rancheros, Hummus, Ice cream, Lasagna, Lobster bisque, Lobster roll sandwich, Macaroni and cheese, Macarons, Miso soup, Mussels, Nachos, Omelette, Onion rings, Oysters, Pad thai, Paella, Pancakes, Panna cotta, Peking duck, Pho, Pizza, Pork chop, Poutine, Prime rib, Pulled pork sandwich, Ramen, Ravioli, Red velvet cake, Risotto, Samosa, Sashimi, Scallops, Seaweed salad, Shrimp and grits, Spaghetti bolognese, Spaghetti carbonara, Spring rolls, Steak, Strawberry shortcake, Sushi, Tacos, Takoyaki, Tiramisu, Tuna tartare, Waffles)

6. If none of the suggestions provided above helped, please contact the Phaze support team here or send us an email at bothkevins@gmail.com.

The foot-step counter is counting steps every time I shake my phone.

1. The footstep counter is based on the acceleration of the phone. So every time the phone moves quickly it will count as a step. We have calibrated the footstep counter to get the maximum accuracy. In some cases the footstep counter overstates and in other cases it understates the number of footsteps. Please use this feature as a rough estimate daily.



8. Maintenance information

Check for updates regularly

The Phaze team is constantly innovating and improving our features so installing the latest updates will ensure a smooth user experience.

Ensure that there is enough memory on your mobile device

The Phaze application uses the mobile's memory to store user information. Over time this can build up. If there is an insufficient amount of memory then the application will not be able to record your nutritional information so please ensure you have free memory on your mobile device.

Ensure that you have a secure internet connection

All our features require a secure internet connection to operate smoothly so please ensure you are connected to a secure internet connection.

Ensure you have a supported android operating system

The Phaze mobile application is only compatible with android operating systems that are greater than Android 4.0 (version Ice Cream Sandwich) and higher.

9. Safety warnings

- Please use this application as a tool to achieve your fitness goals. We recommend sticking to the recommended food intake based on your BMI.
- If you have any medical conditions that require exact measurements of micronutrients please note that our calculations are not fully accurate and can vary due to the source of the information we are using.

10. Technical specifications

Convolutional Neural Network - Image Classification

A convolutional Neural Network (CNN) was used in this application as it is known to provide accurate results for image classification. To train this CNN we used the Food101 dataset that provides 101,000 images on 101 different food classes. This provided CNN with sufficient data to train to make accurate predictions. The CNN divided this dataset into 75% of the image for training the CNN while 25% of the image was used for validating the accuracy of the CNN. Once completed, the data was processed to such as scaling, converting to matrices, and data augmentation. Finally, the model is created and then the CNN starts training the CNN. Testing was conducted on the created model via automation of 300 images where the actual image classification is compared to the predicted image

Database

The database uses a MySQL Relational Database by Amazon Web Services. This database has the ability scale according to the demand of users data being stored. The database is queried by the android application via a Flask server. The Flask server uses a python script with a python MySQL connector that allows python to query the database. This information is then passed back to the android mobile application to be displayed to the user.

Accelerometer

To use the step counter feature, the user's mobile device must include an accelerometer or motion sensor. Our application measures the user step data by collecting movements in the accelerometer and translating that into a step.

Android Operating System

The user should have the newest version of the Android operating system for optimal performance, however our application supports older versions from version 4 Android operating system and higher.



Camera

To use the take picture feature, the user's mobile device must include an HD back camera. The user must first permit the application to use the camera feature.

11. Contact details

both.kevins@gmail.com

12. References

- <https://www.irishtimes.com/life-and-style/health-family/obesity-in-irish-men-increasing-at-alarming-rate-1.3610457> (Irish times obesity in Ireland)
- <https://tagtiv8.com/education-solution-childhood-obesity/> (Obesity in Ireland)