

## BINARY NINJAZ

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# Harvest

## User Manual

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## STAKEHOLDERS

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# 1 General Information

## 1.1 System Overview

Harvest, is an application to assist growers with yield data and optimise worker performance. In other words, it is a system that can efficiently measure the amount of work done by a worker, track the foremen on a farm, record information and data, and display the necessary information. This system is aimed at farming communities to help them record data and get work done more efficiently.

## 1.2 System Requirements

### 1.2.1 Android

The Android application currently requires:

- Either Android 4.0 OS or above
- 200 MB RAM
- 50 MB Disk Space
- Location Services

### 1.2.2 iOS

The iOS application currently requires:

- iOS 10.0 or above
- 200 MB RAM
- 50 MB Disk Space
- Location Services

### 1.2.3 Website

The website requires any modern up-to-date web browser such as Firefox, Opera, Chrome, Safari, Vivaldi, Edge, or any other.

## 1.3 Communications

All of the subsystems—Android, iOS, and website—run independently, but use Firebase<sup>1</sup> to store and retrieve data from a common source. This can be seen in 1

## 1.4 Installation

### 1.4.1 Android

The application will be available for download on the Google Play Store.

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<sup>1</sup><https://firebase.google.com>

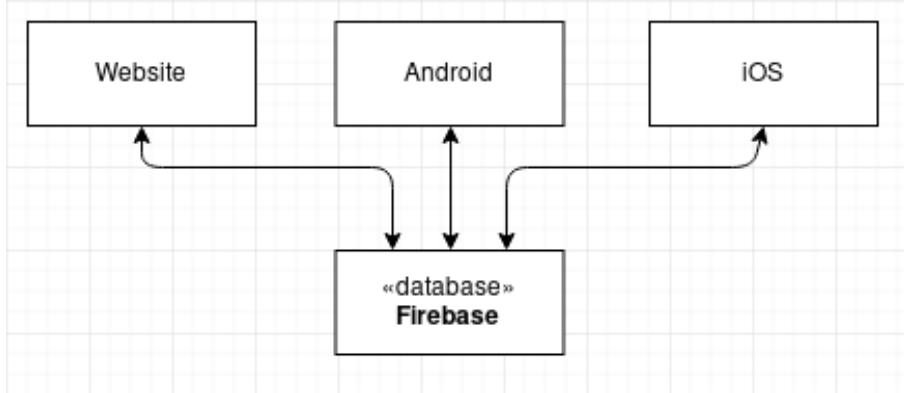


Figure 1: Communications

#### 1.4.2 iOS

The application will be available for download on the Apple App Store.

#### 1.4.3 Website

No Installation is required to use the website, however it can be accessed at <Web Link>.

#### 1.4.4 Location Services

With regards to configuring the iOS and Android applications: location services are required. The user will be prompted for the location permissions in mention to allow full functionality of the application. Profile setting can be configured via selecting the user's username.

## 2 Getting Started

From this point on, the functioning of the Android and iOS applications are similar, so they are grouped into a single Mobile section, and unless otherwise stated, the description applies to both applications.

### 2.1 Mobile

#### 2.1.1 Creating an Account

The application will open by default on the log in screen. From here the user can choose to sign in as a farmer or as a foreman, or to create a new farmer account. A foreman does not need to create an account, they simply sign in with their phone number, however the farmer must ensure that the foreman appears on their system and that the foreman's number is correct.

To create a farmer account the following information is required:

- Email
- Password

Additionally the following information can be optionally provided:

- First name
- Surname
- Organization

Organization is most important since it will be used by foremen to identify your organization when they log in. **If it is not provided, you will be identified by your email, which will then be visible to your foremen.**

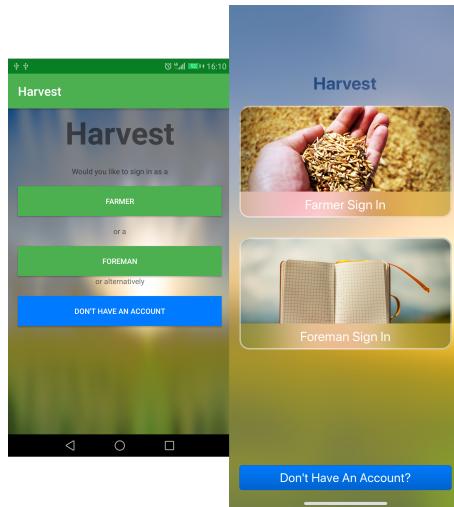


Figure 2: Sign In/Up Method Choose

### 2.1.2 Logging In as a Farmer

When on the log in screen enter your email and its password you used to create the account, alternatively click log in with Google to use Google credentials, which will be linked to Harvest if they have not already. If you have already logged in the app will keep you logged in until you log out.

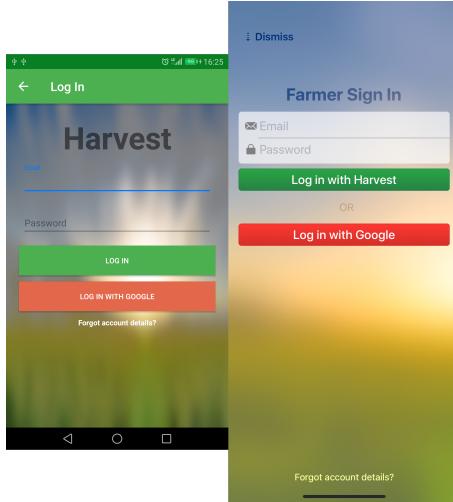


Figure 3: Log In Form for Farmer

### 2.1.3 Logging In as a Foreman

Simply enter your mobile phone number and press the button. A verification code may be sent to you via SMS, which will then need to be entered. Once that is done a confirmation screen will be displayed, it will show the phone number saved in the system so that the farmer can confirm that it is saved correctly. Then, depending on the situation, the following will be displayed:

- If the foreman is not assigned to any organization, then they will be prompted to go back and will not be able to continue.
- If the foreman is assigned to a single organization, the name will be displayed, and they will then be able to continue to the clicker as seen in ??.
- On the off chance that the foreman is assigned to multiple organizations, they will be able to select which organization they wish to work for for the session. In order to change this, they must log out and in again.

### 2.1.4 Logging Out

The Log out button can be found at the bottom of the Harvest "Settings" Tab.

## 2.2 Website

*For ease of visualization, a diagram representing a map of the website is given in 4: each web page is given, indicating to where, and how a traversal is possible from that page.*

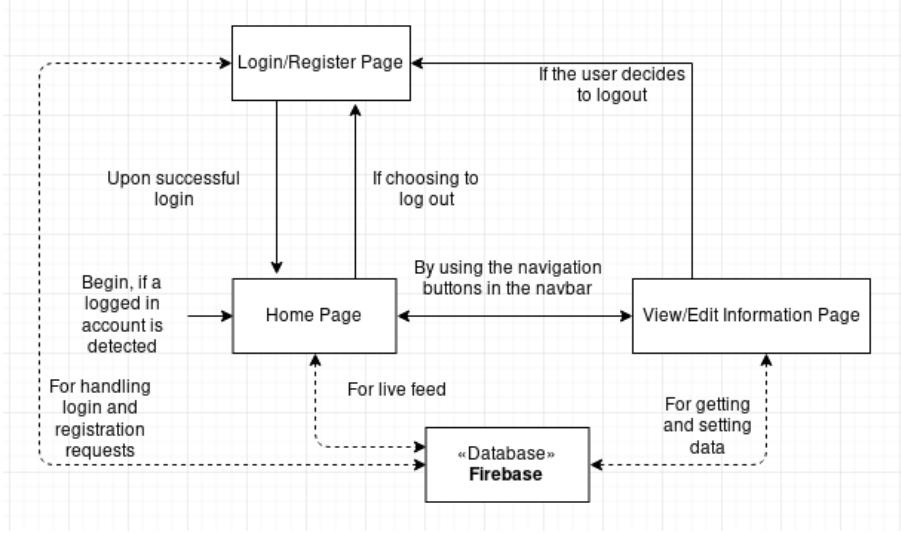


Figure 4: Website Map

### 2.2.1 Registering

**Finding the Register Page** The login and registration page can be found at <Web Link>, and once there the user will be presented with the page as seen in 6. To now create an account the user must click on the blue **Don't have an account? Sign Up** button. They will now be presented with the above page.

**Creating an Account** Once at the register page the new user must enter their first name, surname, email address, desired password, and confirm the desired password by entering it again. When all of the information has been entered, and the user is content that the information is correct, they shall click on the green **Create Account** button. They will now be taken to the login page as seen in 6. The user shall receive an email as seen in ?? at the specified address, asking to confirm their account. The user simply needs to click on the **Confirm Account** button in order to complete the account creation.

### 2.2.2 Logging In

**Finding the Login Page** The login and register page can be found at <Web Link>.

**Logging In** The user simply enters the correct email address and password associated with their account, and clicks on the green **Log In** button. The user will now be taken to 3.2.2.

### 2.2.3 Logging Out

The **Sign Out** button can be clicked, at the top right of the navigation bar, to sign out at any time.



Figure 5: Register Page

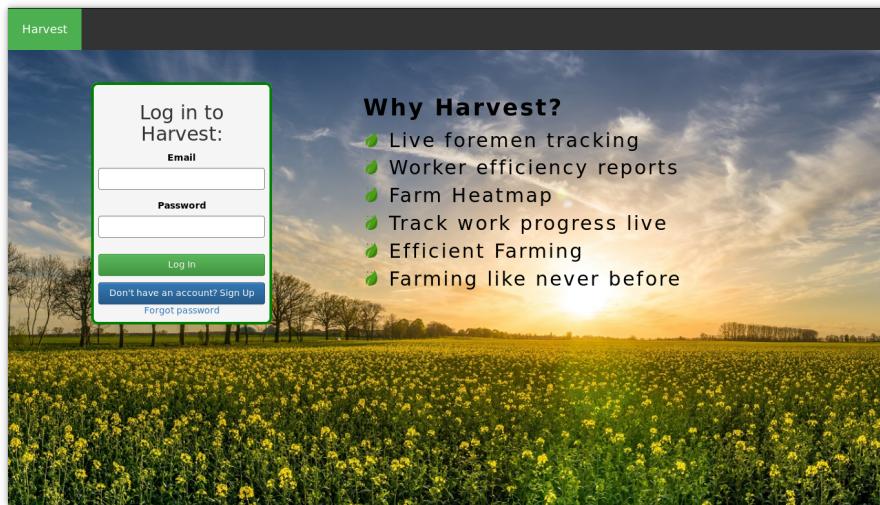


Figure 6: Login Page

## 3 Using the System

### 3.1 Mobile

#### 3.1.1 Navigating

If a foreman is logged in, then they can only access the clicker.

A farmer will have a navigation bar displayed at the bottom that they can use to get to different functionalities of the application.

*A discrepancy between iOS and Android exists in the form of settings. To access the settings in Android, the three dots must be pressed on, in the top right, and settings chosen.*

The following is accessible through the navigation bar:

- 3.1.2: Yield Tracker
- 3.1.3: Information
- 3.1.4: Sessions
- 3.1.5: Statistics
- 3.1.6: Settings (OS dependent)

#### 3.1.2 Using the Yield Tracker

The Yield Tracker is shown in 7. Should the required location permission be disallowed, and the GPS disabled, then this system will not work. The user will be prompted to enable this services.

Note that the bar at the bottom is only displayed when a farmer is logged in. A foreman will have no access to the other functionalities of the application.

To use the Yield Tracker the following process is followed:

1. Press "Start"
2. Click the plus buttons bellow the workers name to increment or decrement the amount of bags they dropped off.
3. Press "Stop"
4. A summary of the session will be displayed.
5. The session can then be saved or discarded.

#### 3.1.3 Information

This works exactly the same way as in the website, please see ??.

Please see, however, 8, for a description of unlabeled buttons with regards to Information on Android. Whereby:

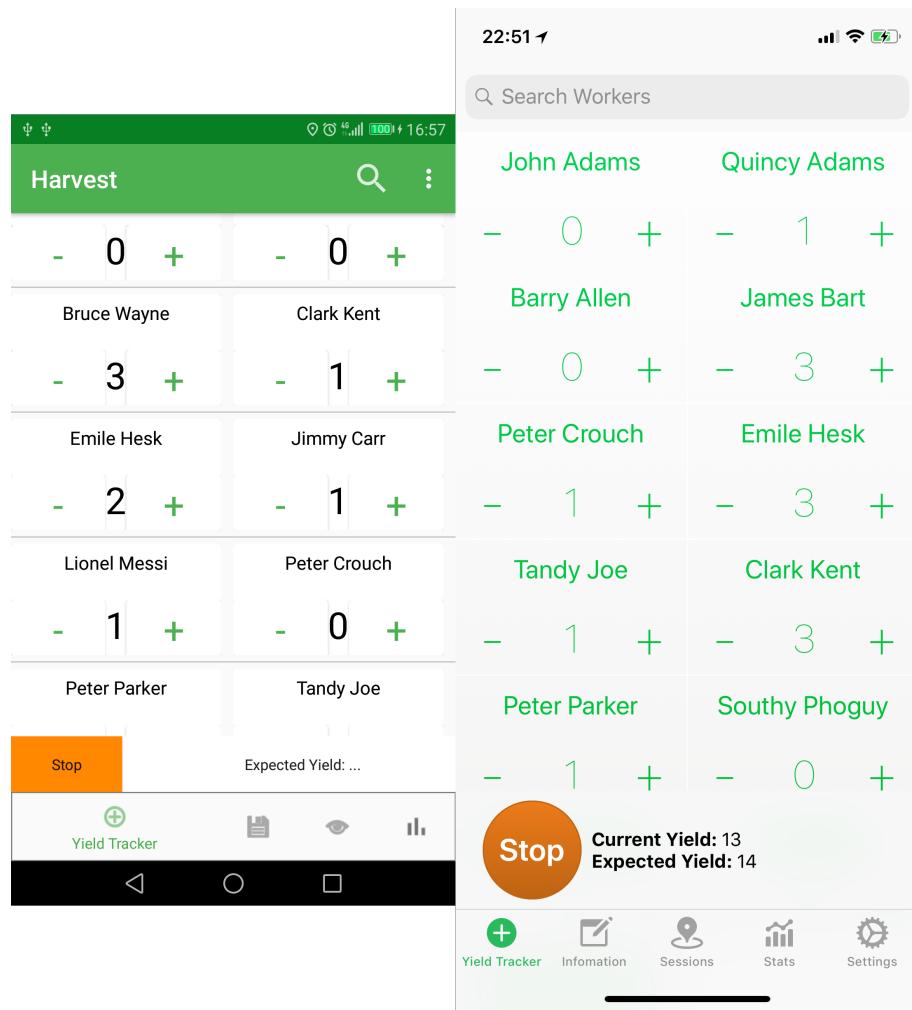


Figure 7: Yield Tracker

**Add** creates a new item.

**Save** saves the item that is being modified.

**Edit** allows for editing of the currently displayed item.

**Delete** deletes the item that is being edited. A confirmation will be displayed.

### 3.1.4 Sessions

Here a list of all sessions carried out is displayed. A session can be selected to get retrieve further information about it. See 9. The button **TRACKED PATH AND COLLECTION POINTS** can be selected to see a map, where all of the orchards can be seen, as well as the path that was taken by the foreman that was administering the session. Red pins can also be seen along the path, where each indicates where the foreman was when they indicated a bag dropped by a worker.

### 3.1.5 Statistics

From here, varies statistics can be seen.

### 3.1.6 Settings

The following settings are available:

- Account: account related settings.
  - Update Email: change email address (may need to re-authorize.)
  - Update Password: change password (may need to re-authorize.)
  - Organization: change the name of the organization, used by foremen to identify it.
  - First Name: change first name.
  - Surname: change surname.
  - Delete Account: delete the account. **This is irreversible, all information related to the account will be lost** (may need to re-authorize.)
- Logout (iOS only, on android this is accessed from the menu that is used to access settings.)

*Some sensitive settings, such as deleting the account, may require the user to re-authorize. In this scenario, a dialog will pop up asking them to re-enter their email and password; after which the action will be performed.*

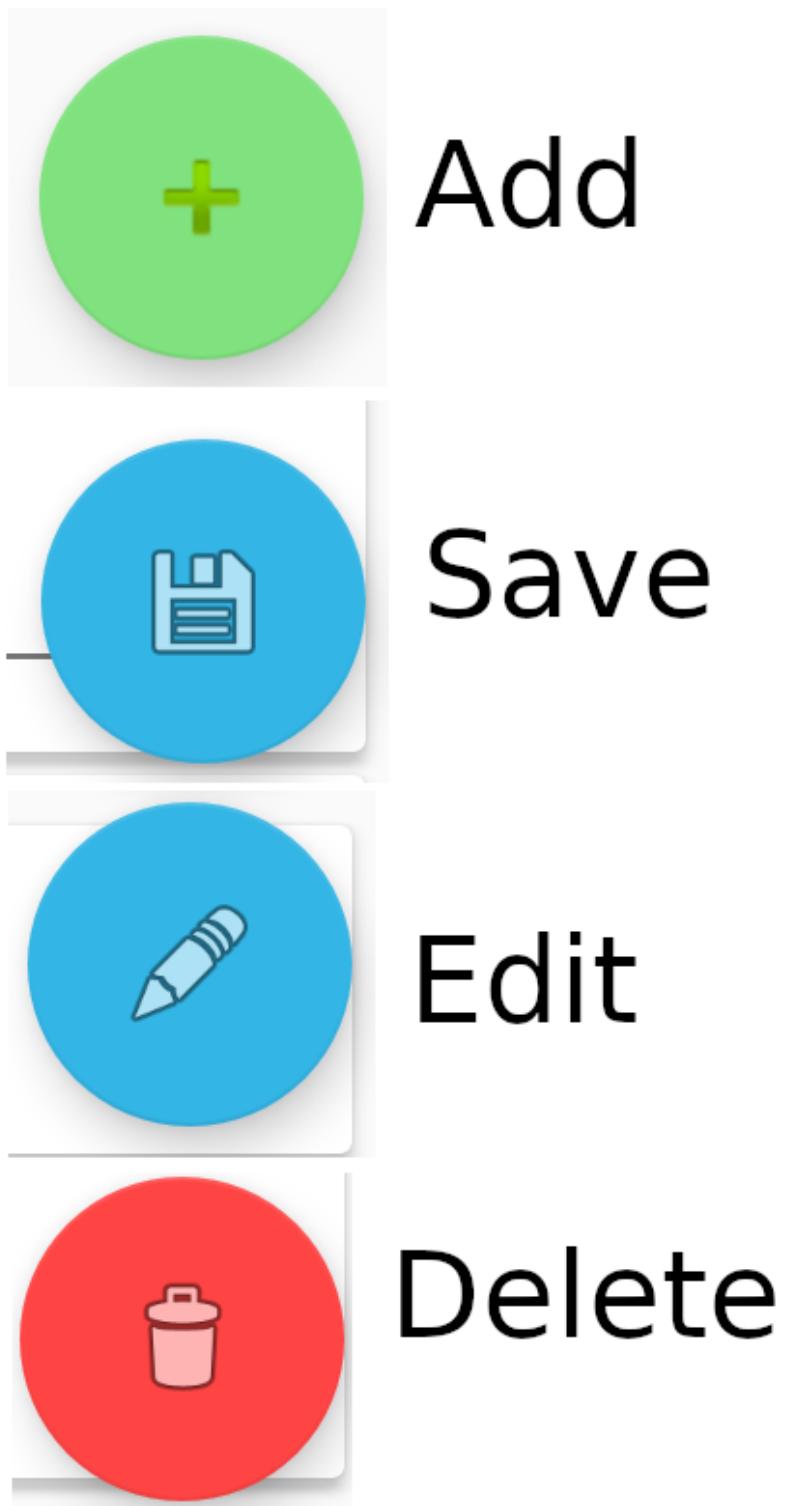


Figure 8: Android Information Buttons

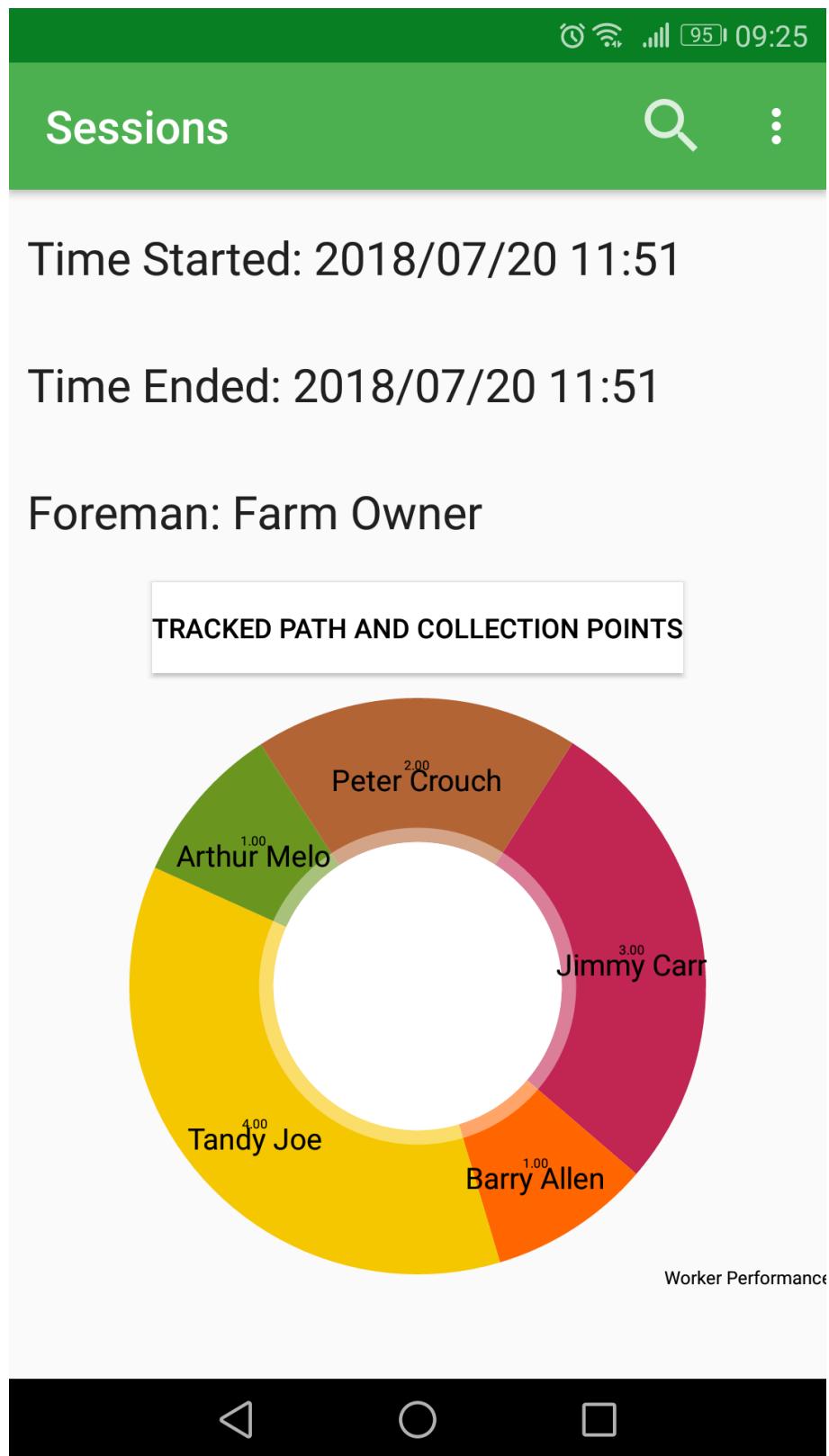


Figure 9: Session

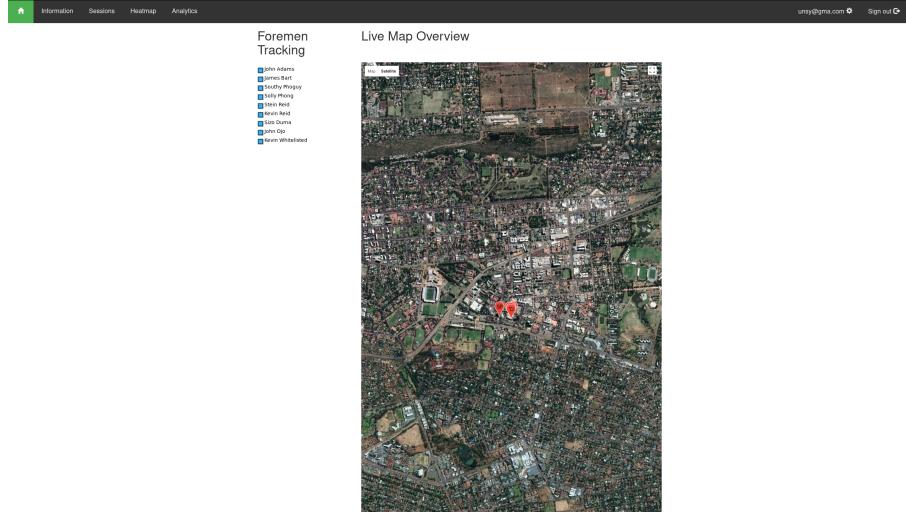


Figure 10: Home Page

## 3.2 Website

### 3.2.1 Navigating

On all web pages a consistent navbar can be seen at the top of the page. The following items are always present:

- 3.2.2: Home Page
- 3.2.3: Information
- 3.2.4: Sessions
- 3.2.5: Heatmap
- 3.2.6: Analytics
- 3.2.7: Settings
- 2.2.3: Sign Out

### 3.2.2 Home Page

Once the user has logged in, they will be taken to the home page, as seen in 10. The home page is the starting point of the system, it serves simply by providing a real time updating feed of all bag drops, and a map overview of the farm and the locations of foremen.

### 3.2.3 View/Edit Information

**Introduction** The View/Edit Information page can be found at any time by clicking on the View/Edit Information button in the navbar. Once clicked on, the user will be taken to 11. The concept is that almost all information can be viewed from this page, and once the relevant information has been located, it can also be edited.



Figure 11: View/Edit Information Page

**Locating the Correct Information** When in 11 there are three blue buttons available; **Farms**, **Orchards**, and **Workers**. Each of which will expand a list of the relevant items. The entire process is best described through an example, so, in this example, the goal is to locate information on a worker named *Joe Soap*. The process, however can be accomplished in multiple ways; the first, and most obvious is to select **Workers**, then *J. Soap* (the process can be seen by following 11, 12, and 13), however, if the user is looking at the **Pear Shaped** orchard, and see's that *Joe Soap* is assigned (see 14), then they can click on the button representing *Joe Soap*—labeled *J. Soap*—to go to *Joe Soap's* page, as seen in ??, note that the list of orchards is still displayed.

**Adding Information** Note that at the top of the second list in 12, 13, 14, or ?? there is a green **Add Farm**, **Add Orchard**, or **Add Worker** button, clicking this button will display the interface to enter the necessary information. An example of this can be seen in 15, where a new orchard can be created. Once all of the necessary information has been entered, then the **Save** button can be clicked to create the new orchard, note that none of the fields are required.

**Modifying Information** When looking at any information, a **Modify** button can be seen at the top (see 13, 14, or ??). In 16 the view when *Joe Soap* is being modified can be seen. The fields are already populated by the information that was already stored in them. Once the user is content with the changes, they can click on the orange **Save** button to apply the changes. A reminder that no fields are required, so that fulled in fields can be erased. The user can also click on the red **Delete** button to delete the entry in its entirety—note a confirmation dialog will appear. The user may also cancel, which will return them to before they clicked on **Modify**, as seen in 13, 14, or ??.

**Stored Information** Below, the fields stored are described.

### Farm



Figure 12: Workers

A screenshot of the "Add Worker" form for "Joe". The form fields include: "Worker Name" (text input), "Worker Surname" (text input), "Assigned Orchard" (dropdown menu set to "Paw Shaped"), "Worker Type" (dropdown menu set to "Foreman"), "Information" (text area with placeholder "We just can't identify him."), and "Foreman Email" (text input set to "jew@soap.com"). There are "Save" and "Cancel" buttons at the bottom.

Figure 13: Looking at a Worker

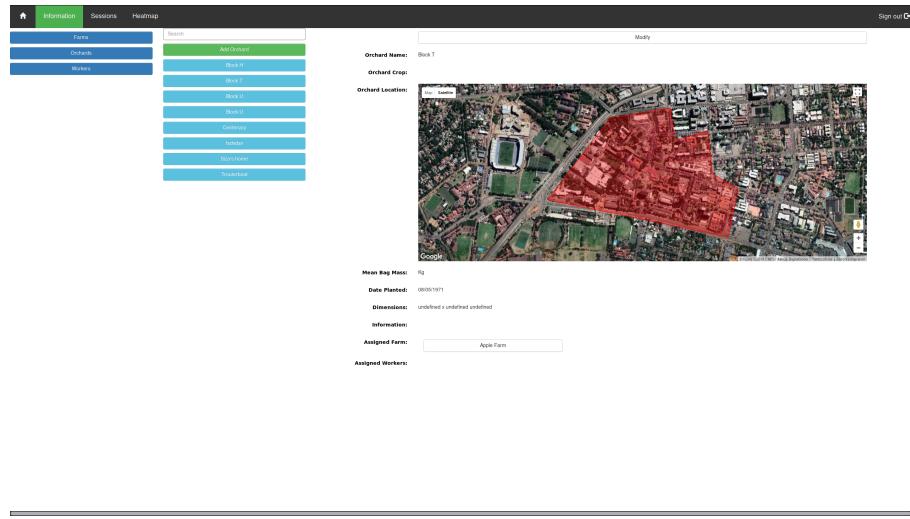


Figure 14: Looking at an Orchard

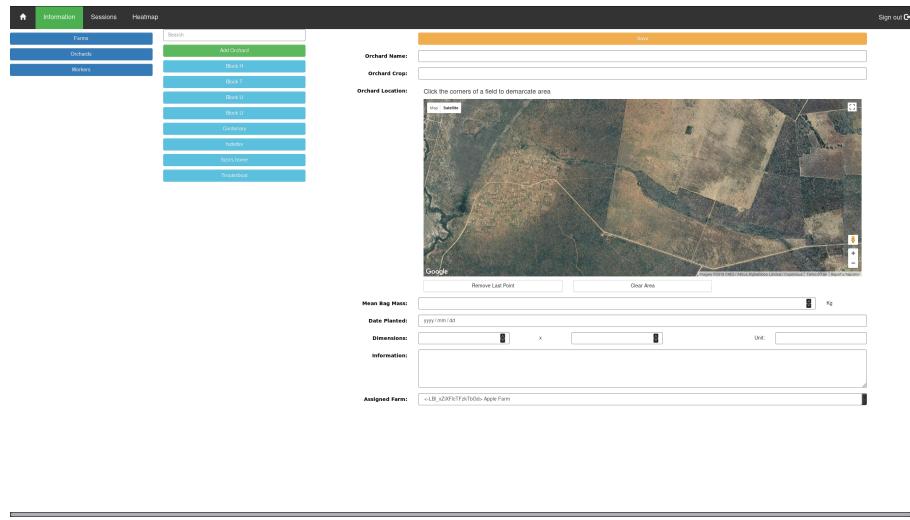


Figure 15: Adding an Orchard

Figure 16: Modifying a Worker

- *Farm Name*: the name of the farm.
- *Information*: any further textual information about the farm.
- *Assigned Orchards*: a clickable list of the orchards assigned to the farm.

### Orchard

- *Orchard Name*: the name of the orchard.
- *Orchard Crop*: the type of crop grown in the orchard.
- *Mean Bag Mass*: the average mass of a bag that is harvested from the orchard.
- *Date Planted*: the date that the orchard was planted.
- *Spacing*: the spacing of the crops.
- *Information*: any further textual information about the orchard.
- *Assigned Farm*: a clickable button indicating the farm that the orchard is assigned to.
- *Assigned Workers*: a clickable list of the workers assigned to the orchard.

### Worker

- *Worker Name*: the first name of the worker.
- *Worker Surname*: the surname of the worker.
- *Assigned Orchard*: a clickable button indicating the orchard that the worker is assigned to.

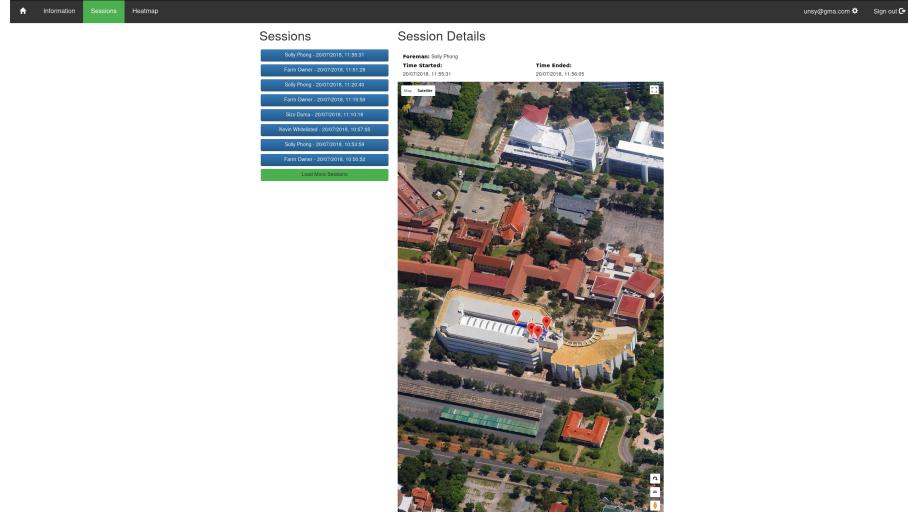


Figure 17: Session

- *Worker Type*: indicates if the worker is a foreman or a regular worker.
- *Information*: any further textual information about the worker.
- *Foreman Email*: in the case of a foreman, their email address for linking to their app.

### 3.2.4 Sessions

From here, a list of all sessions can be seen and selected. Once selected, information about the session will be displayed. Above the map the foreman that administered the session; and the time started, and ended; are displayed. The map shows the path taken by the foreman, as well as where they were when they indicated a bag drop. Please see 17. Below the map a pie chart is displayed, showing what portion of the total bags dropped was done by each worker.

### 3.2.5 Heatmap

The heatmap (3.2.5) shows where the majority of bag drops took place, by having more active areas be redder.

### 3.2.6 Analytics

The Analytics on the website can be seen in 19.

The top (radar) graph shows the performance of the selected orchard, which is chosen in the first dropdown. Then the start and end date can be selected, and once **Filter Orchard Graph** is selected, the graph will be generated.

The second, and final, graph shows the performance of the selected worker—which is chosen in the second dropdown—for the selected date. Once this is chosen, and **Filter Worker Performance Graph** is clicked on, the graph is generated. It shows the number of bags collected by the selected worker in each hour of the chosen day.

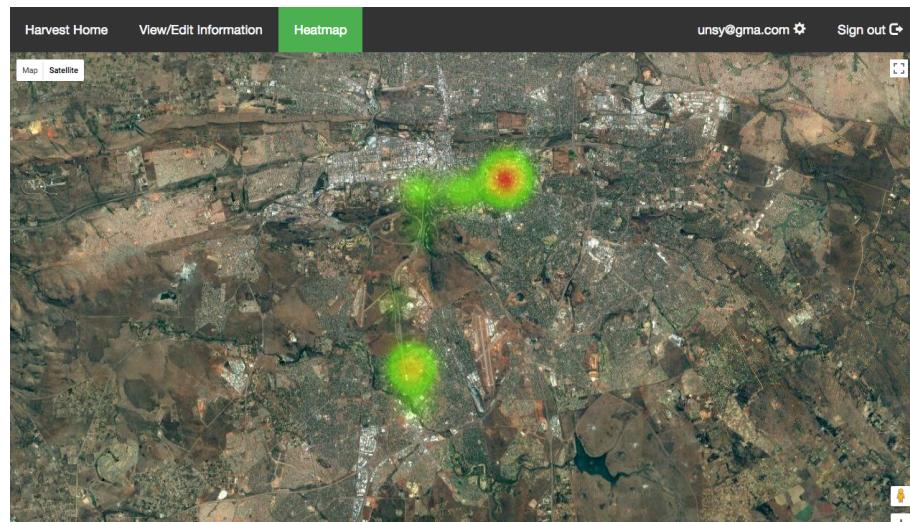


Figure 18: Heat Map

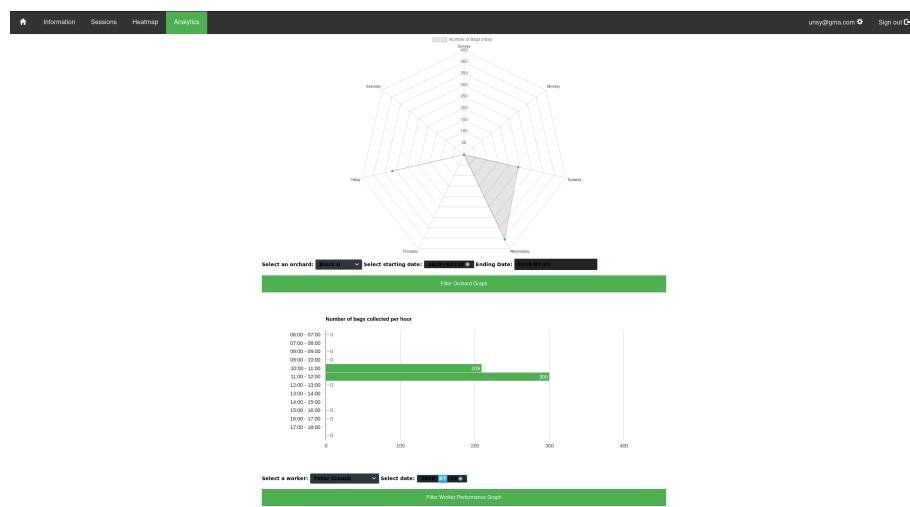


Figure 19: Website Analytics

### **3.2.7 Settings**

## **4 Troubleshooting**

### **4.1 Mobile and Website**

#### **4.1.1 Forgotten Password**

1. On the sign in screen, tap "Forgot account details?" button.
2. When asked for your email, enter the the email address of the account with the forgotten password.
3. An email will be sent to that address.
4. Follow the instructions in the email. You will click on a link in the email.
5. From the web page that the link sent you to, Enter the new password for your account.
6. Log in to Harvest using your new details.

### **4.2 Mobile Only**

#### **4.2.1 Location Services**

1. Check that your phone supports location services
2. In the "Settings" application make sure that the Harvest app is allowed location services

### **4.3 Website Only**