



PROJECT TITLE

Intelligent Agricultural Assistance

**Department of Computer Science and Electrical Engineering**  
**FINAL PROJECT**

Team# 10

Team Members

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## 1. Introduction

### Project Goal:

The core idea of this project is to help farmers in boosting yield of their agriculture crop, supporting & guiding them throughout the process, from choosing a crop; till they sell the yield completely. The way we do is suggesting them with other probable crops that can be grown in their farm which are determined by various factors like; real time weather, chemical composition of the soil in which crops are grown, cycle of crops that were being grown over the years in that land. We also provide short term crops that can be grown when the major crop is germinating. We suggest methods to reduce the excessive use of fertilizers and pesticides, thereby promoting natural methods & effective utilization of the space in the field without increasing the competency to the major crop.

- **Motivation**

Data Analysis has become very popular, analysis of data refers in examining data and deriving fruitful conclusion out of that data. Conventional methods are given a lot of preference in agriculture, modifying our pace of cultivation could increase the output considerably. Applying ingenious data analysis to the vast amount of data gathered, will let us narrow down to a list of most efficient growing crops, other than the regular ones. This whole guidance could benefit the farmer in many ways. Along with the assistance given to the operations done on the field, helping them in selling the yield with digital marketing could improve the lives of farmers in many ways.

- **Uniqueness**

Use of predictive analysis, a data mining technique; and determining the possible sustainable crops for a particular agricultural area by observing the patterns of the existing data makes this approach unique. Helping the farmers, dealing with the buying and selling of inputs and output yield also makes this not-like-one before.

## 2. Project Objectives

### 1. Suggesting alternate crops to increase productivity of the land.

Lots of gathered data will be ready for analysis before the implementation of the project. Analysis will be done by inspecting, cleaning, transforming and modelling data with a goal of discovering useful information. This useful information combined with the user's input data, we or the program, gives out a list of probable crops that can be chosen alternatively than the conventional crop.

This gathered data includes, real time weather monitoring system even.

### 2. Helping through the process until the crop yields.

On the user's profile in the website, he/she can have access to a lot of information that is sorted in detail.

They include:

- a. Steps to deal with different kinds of problems that a farmer might encounter over the period of crop.
- b. Tips to improve farming yield.
- c. Latest and advanced equipment that might improve their farming experience.
- d. Real-time weather monitoring system.

We even, send alerts and cautions to be careful at different situations that might come along the way.

### 3. Supporting in selling the yield with digital marketing.

We will bridge the gap between the farmer and the retailer as a digital marketing website and manage the logistics and make it easy for the farmer to sell the yield at the comfort of sitting at home.

### 3. Project Plan for Execution

#### **Pre-Proposal**

- Brain Storming
- Main Goal & Objectives
- Features Disclosed

#### **First Increment**

- OAuth Authentication
- Project Outline
- Agile Implementation using Zenhub

#### **Second Increment**

- Integrating APIs to Web Application
- E-Commerce
- Interactive Dash Board Layout

#### **Third Increment**

- Data Base Design
- Data Base Integration

#### **Fourth Increment**

- Crop Health Prediction
- Deployment & Testing

## 4. Project Features

- **System Features**

### **1. Website**

The website contains the gathered data tables from different sources, which include Geographical Conditions of the soil, Real-time weather monitoring: all these function in the back end. With good user interface, access will be easy and also each farmer can hold an account on the website. The very first time he creates an account, he needs to input the details of the crops and yield that had been grown on the farm over the years.

### **2. Dashboard**

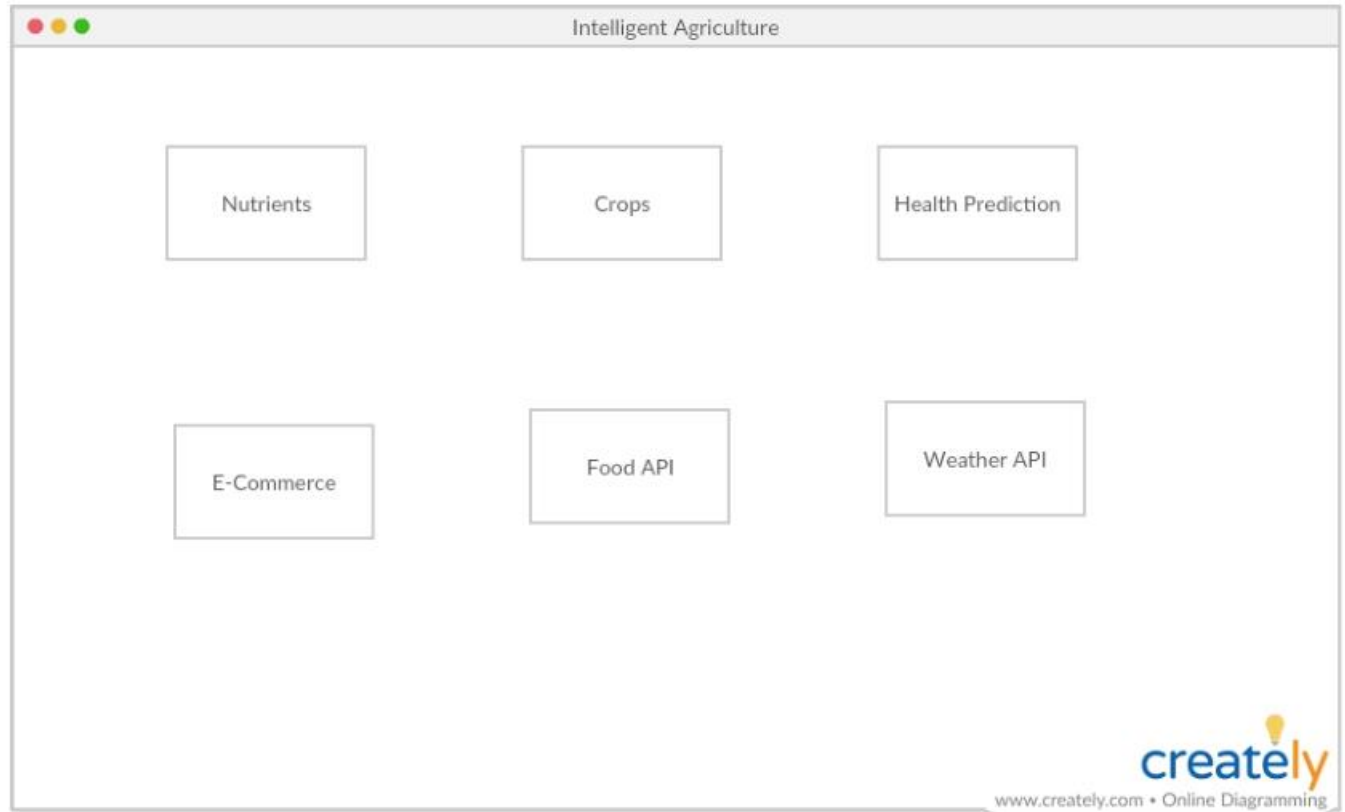
The account holders of the website will have a dashboard, on which the real-time factors can be easily seen, which makes it very easy to deal with the changes in the weather, monitor his resources. And even, a caution or alert will be sent to the farmer's email id whenever there is a need.

## 5. Achieved by Increments

- OAuth Authentication
- Project Outline
- Agile Implementation using Zenhub
- Integrating APIs to Web Application
- E-Commerce
- Interactive Dash Board Layout
- Integrating APIs to Web Application
- E-Commerce
- Interactive Dash Board Layout
- Data Base Design
- Data Base Integration
- Crop Health Prediction
- Deployment & Testing

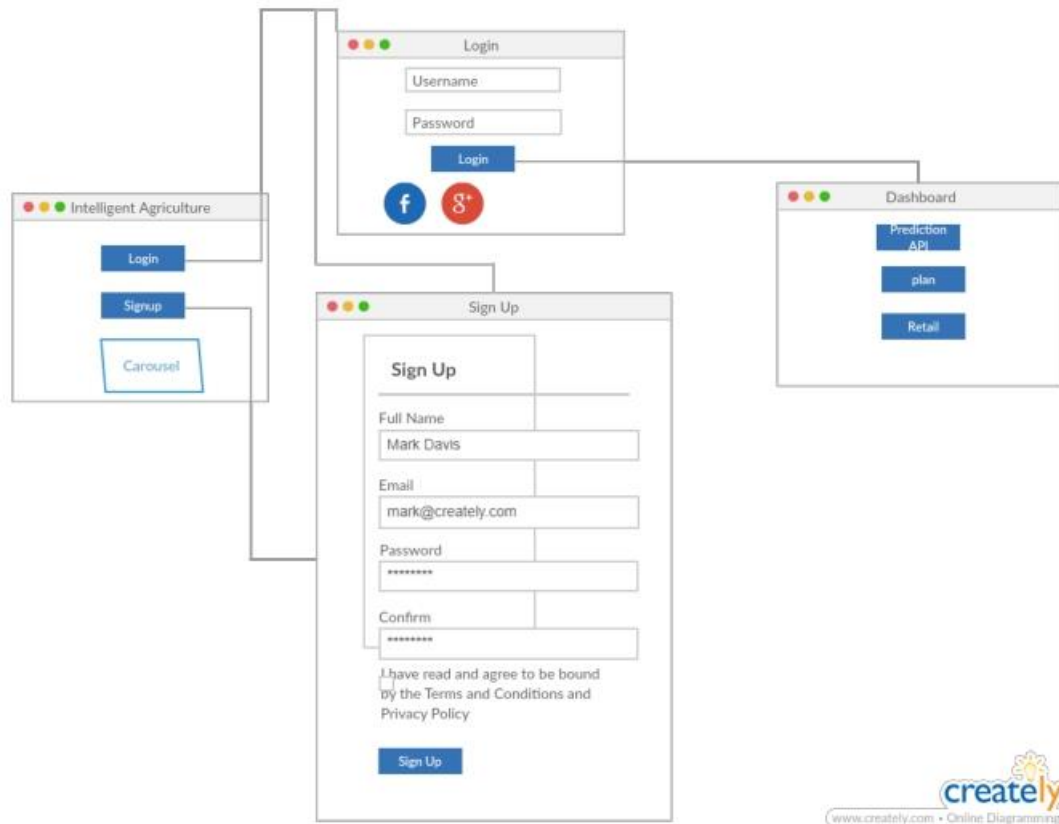
## 6. Wire Frames

Dashboard:

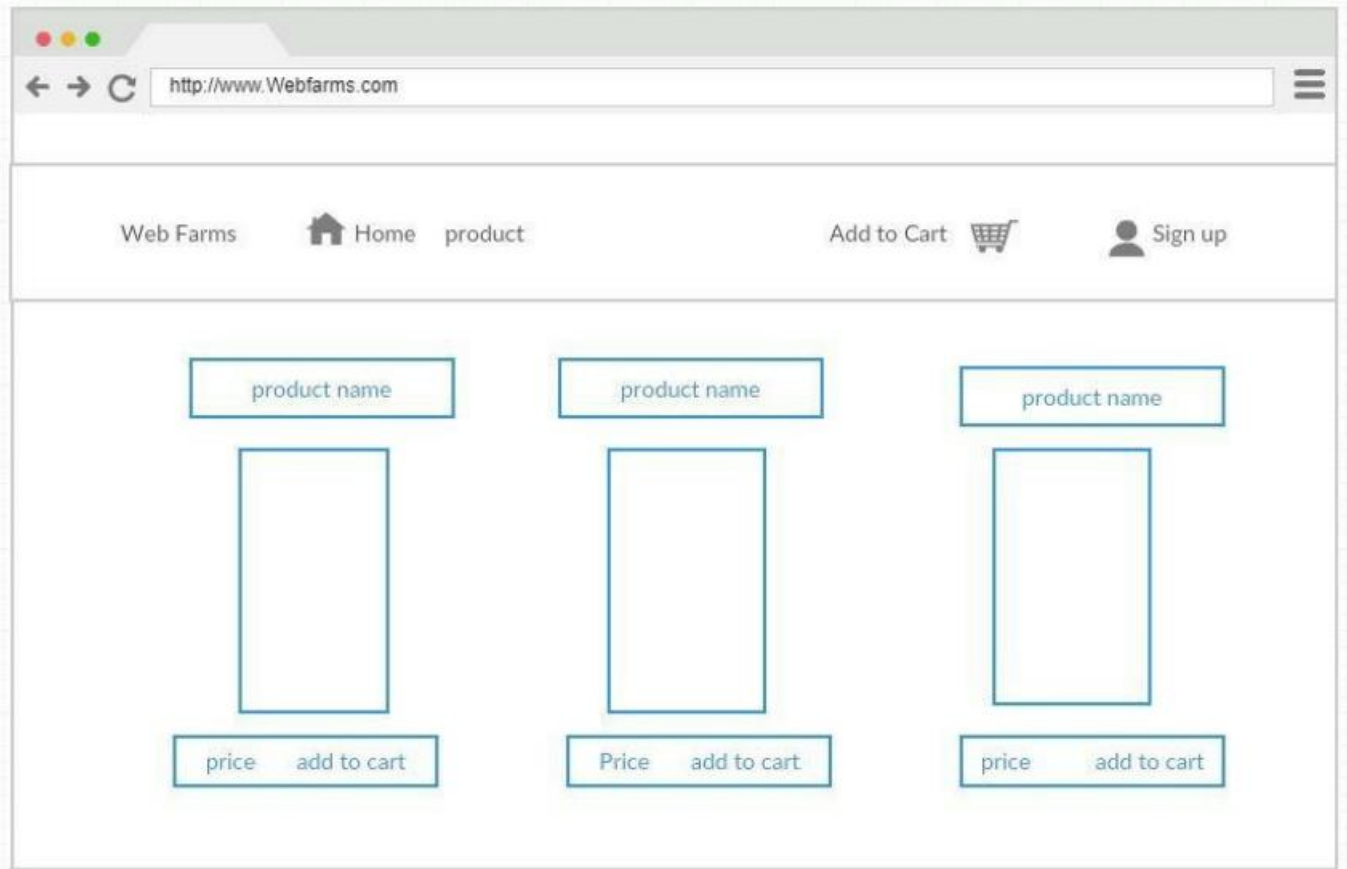




Main Page:



**E-commerce:  
Home Page:**



Client Registration:

## Sign Up

---

Full Name

Email

Password

Confirm

☐ I have read and agree to be bound by the Terms and Conditions and Privacy Policy

**Sign Up**

Client Login:

## Sign In

---

Email



Password

☐ Remember Me

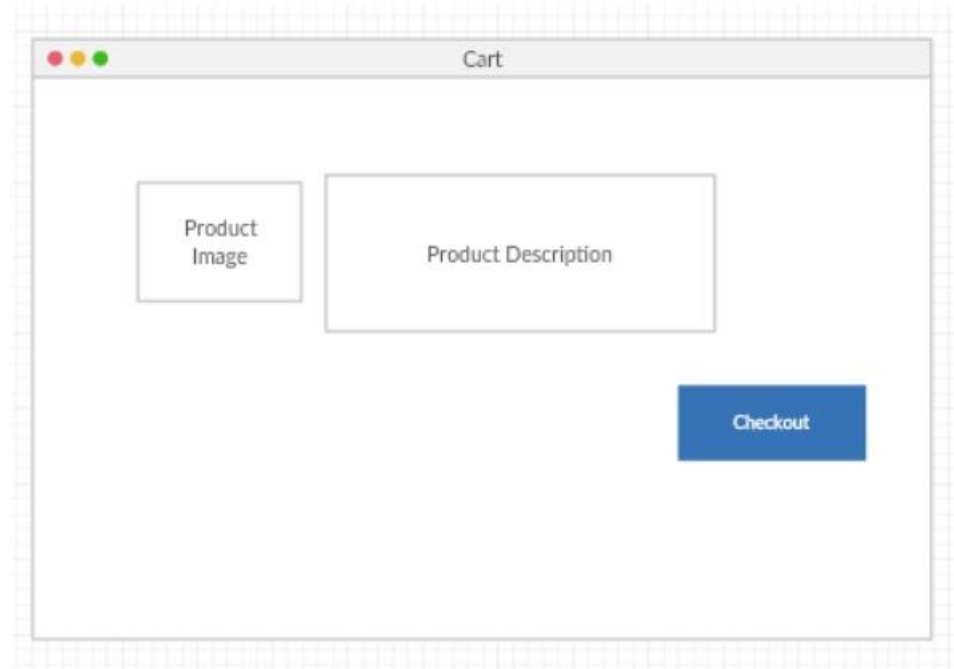
[Forgot your password?](#)

---

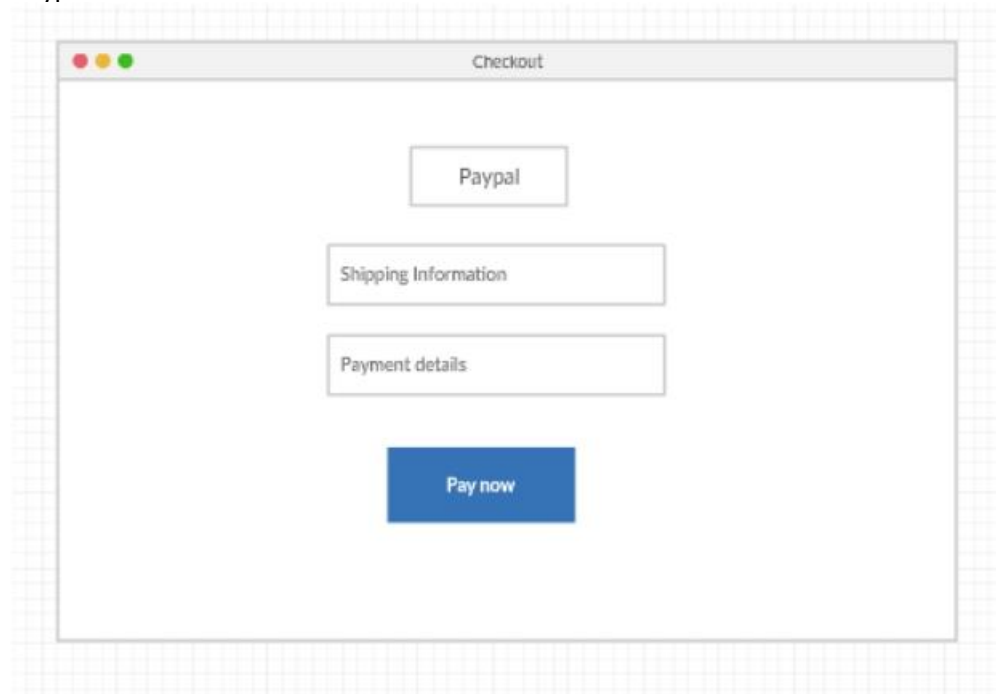
Don't have an account yet?

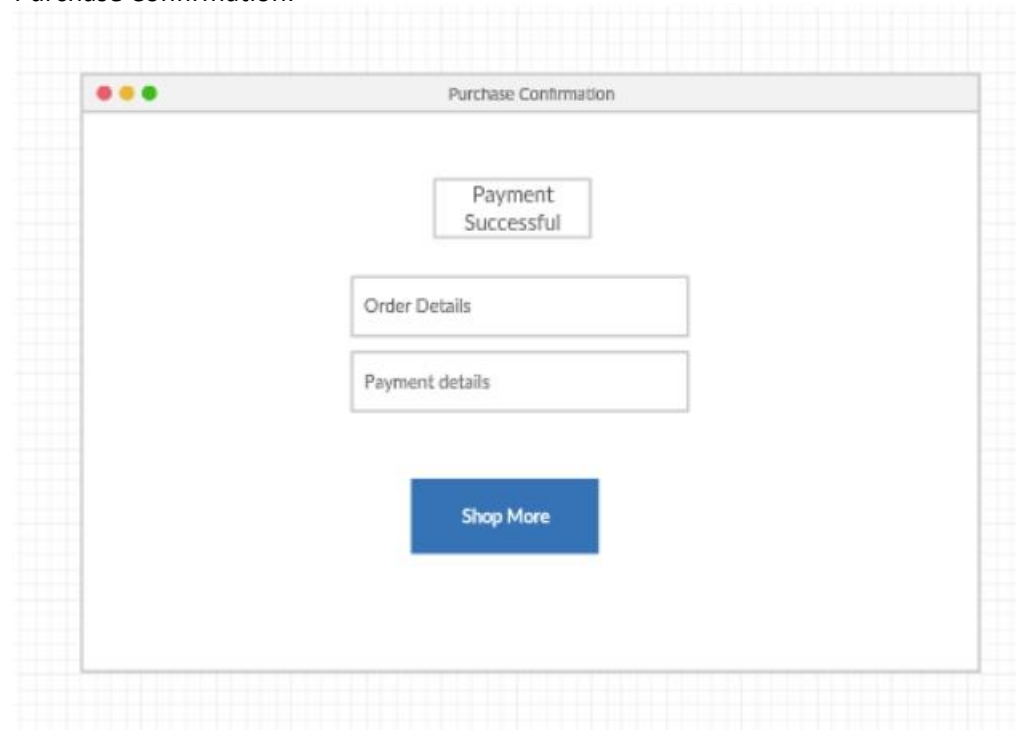
Cart:



Paypal:



## Purchase Confirmation:

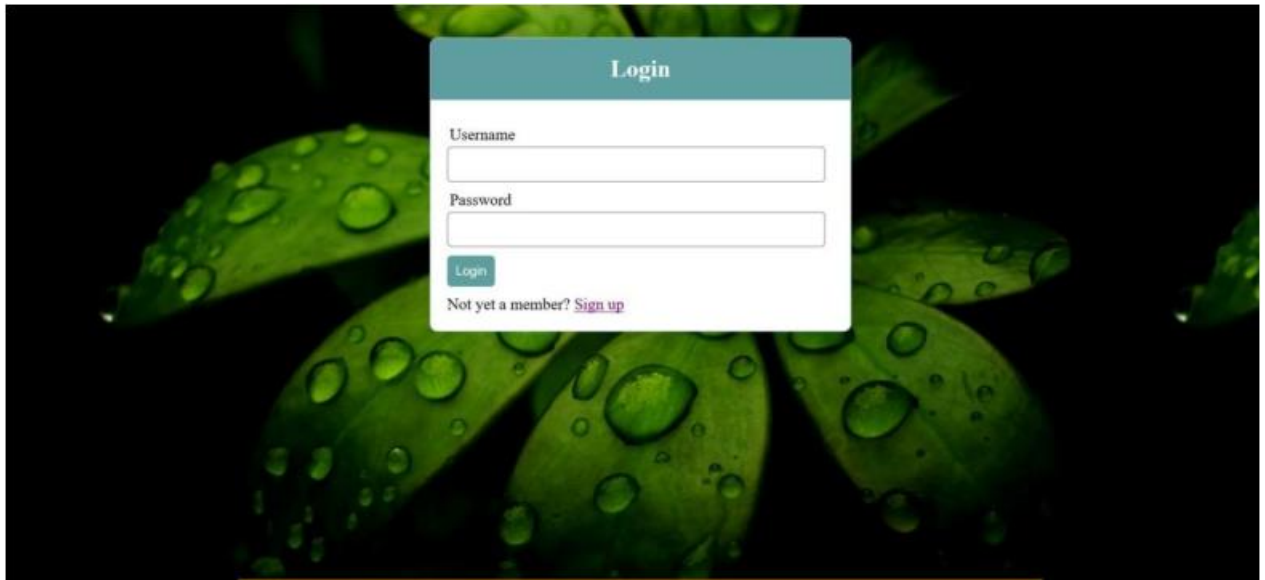


## 7. Screen Shots

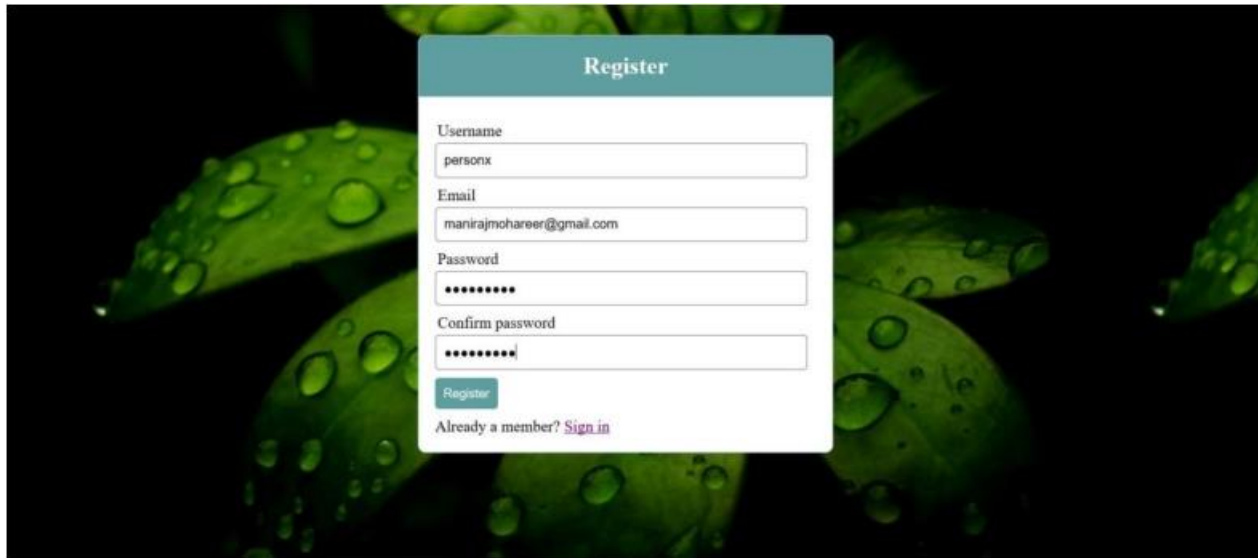
### 1. Welcome Screen with Animation



### 2. Login



### 3.Signup



The image shows a 'Register' form overlay on a background of green leaves with water droplets. The form has a teal header with the title 'Register'. It contains five input fields: 'Username' with the value 'personx', 'Email' with 'manirajmohareer@gmail.com', 'Password' with masked characters '\*\*\*\*\*', and 'Confirm password' with masked characters '\*\*\*\*\*'. Below the fields is a teal 'Register' button. At the bottom, it says 'Already a member? [Sign in](#)'.

Register

Username  
personx

Email  
manirajmohareer@gmail.com

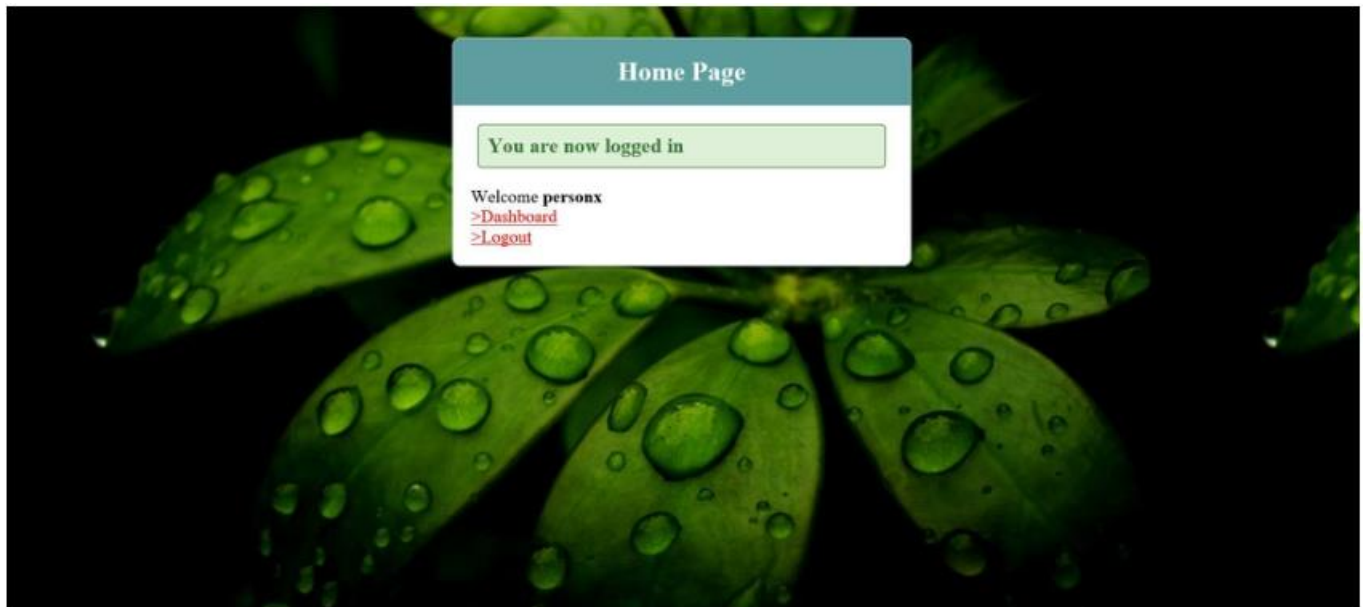
Password  
\*\*\*\*\*

Confirm password  
\*\*\*\*\*

Register

Already a member? [Sign in](#)

### 4.Home Page



The image shows a 'Home Page' overlay on the same green leaf background. The form has a teal header with the title 'Home Page'. Below the header is a light green box containing the text 'You are now logged in'. Underneath, it says 'Welcome personx' followed by two red links: '>Dashboard' and '>Logout'.

Home Page

You are now logged in

Welcome personx  
>Dashboard  
>Logout



#### 4. Dash Board



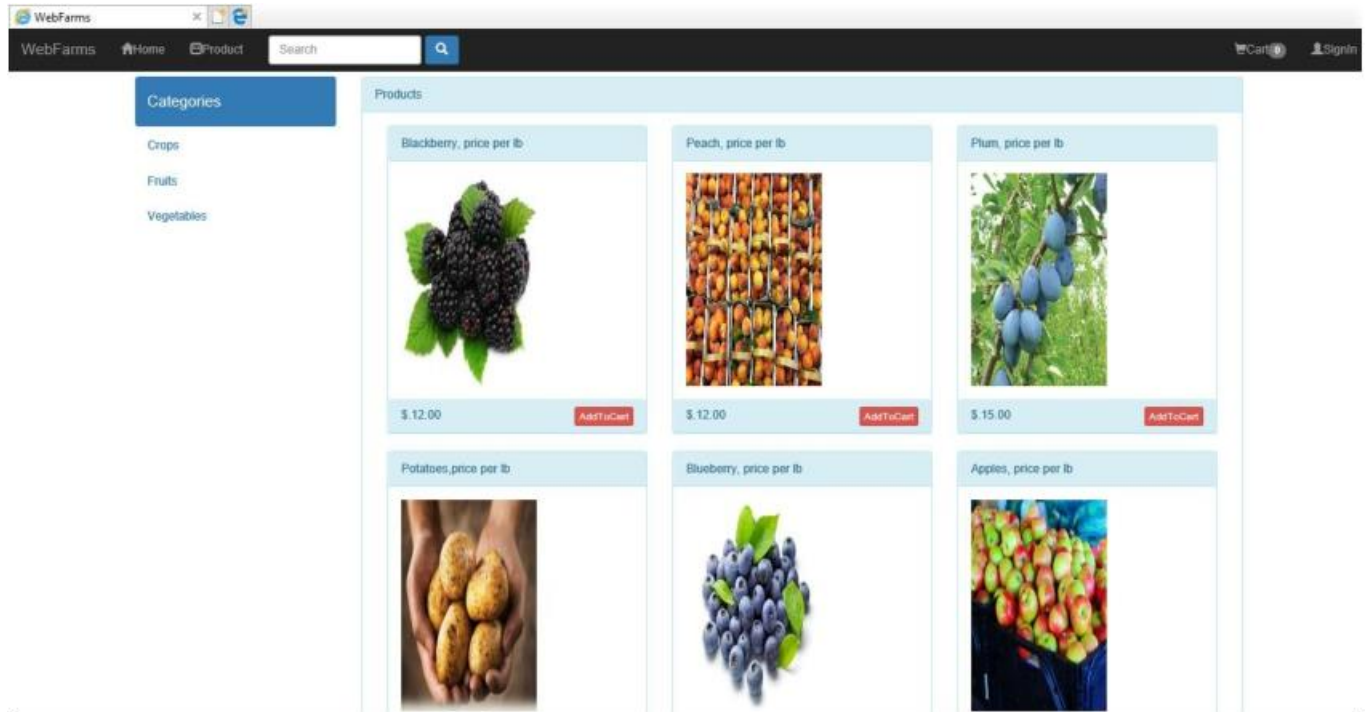
#### 5. Fertilizer

| NUTRIENTS  | FERTILIZERS            |
|------------|------------------------|
| Nitrogen   | Ammonium nitrate       |
| Phosphorus | Rock Phosphate         |
| Potassium  | Potassium Chlorite     |
| Calcium    | Calcium Nitrate        |
| Magnesium  | Epson Salt             |
| Sulphur    | Ammonium Thio Sulphate |
| Iron       | Ferrous Sulphate       |
| Manganese  | Manganese Oxide        |
| Zinc       | Zinc Sulphate          |

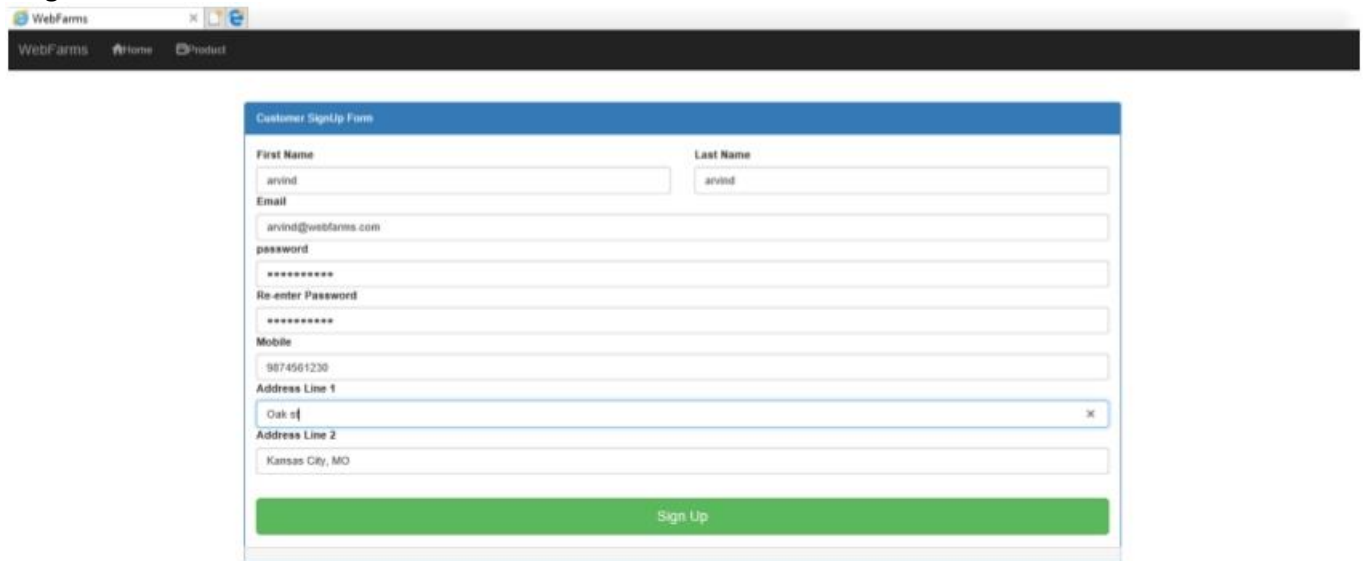
## 6. Weather



## 7. E-Commerce Page



## 8. E-Commerce Client Side: Register:

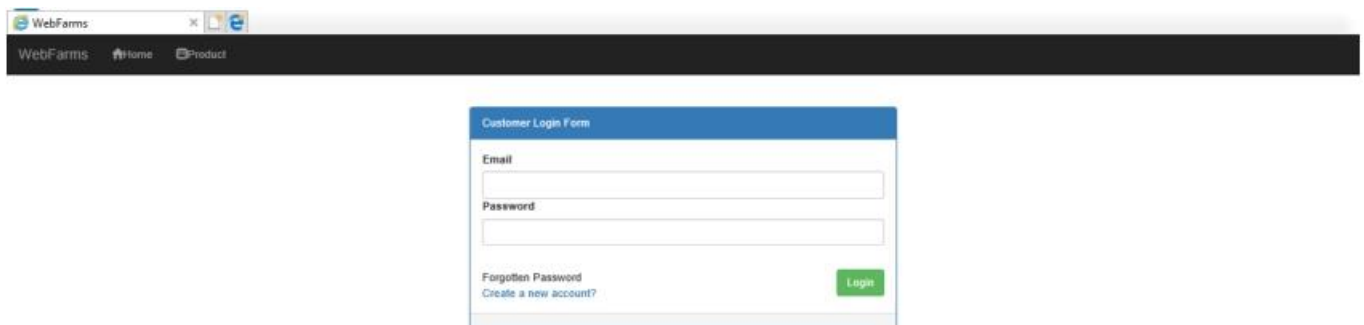


The screenshot shows a web browser window with the title 'WebFarms'. The browser's address bar shows 'WebFarms' and the navigation bar includes 'home' and 'product' links. The main content area displays a 'Customer Sign Up Form' with the following fields and values:

- First Name:** arvind
- Last Name:** arvind
- Email:** arvind@webfarms.com
- password:** \*\*\*\*\*
- Re-enter Password:** \*\*\*\*\*
- Mobile:** 9874561230
- Address Line 1:** Oak st
- Address Line 2:** Kansas City, MO

A green 'Sign Up' button is located at the bottom of the form.

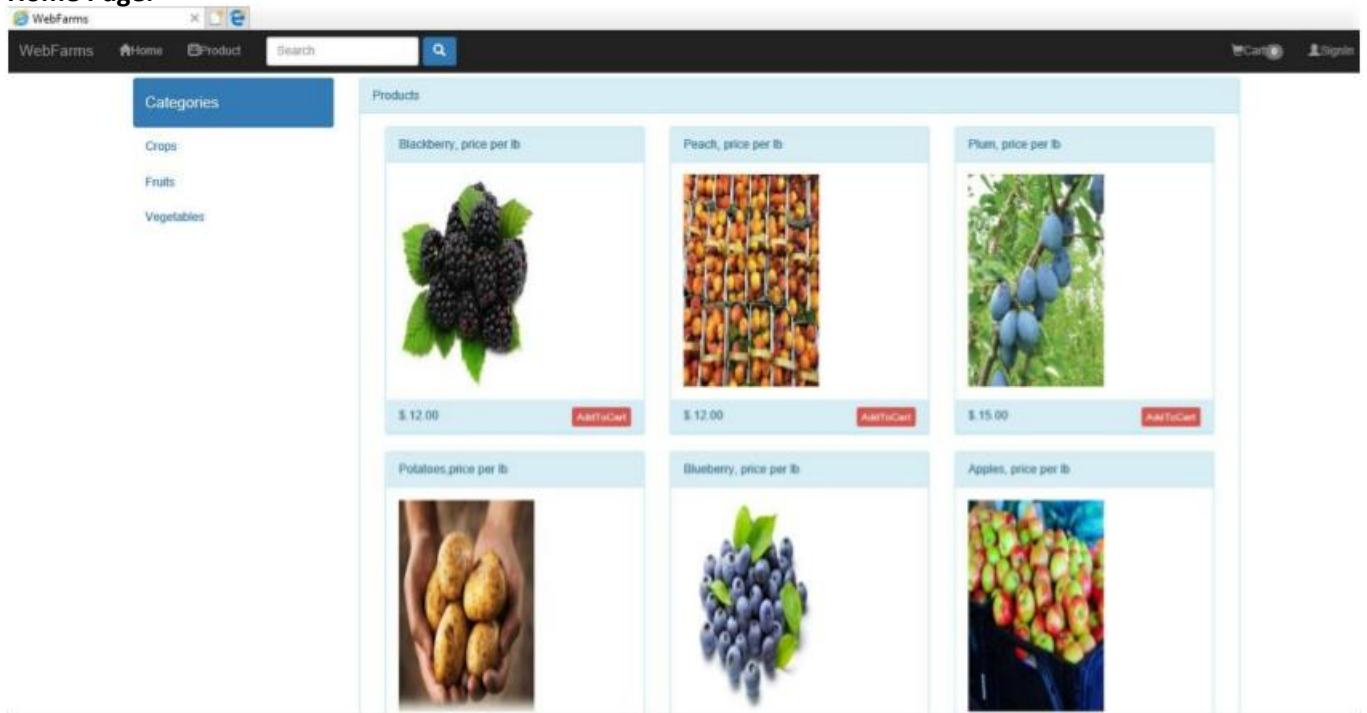
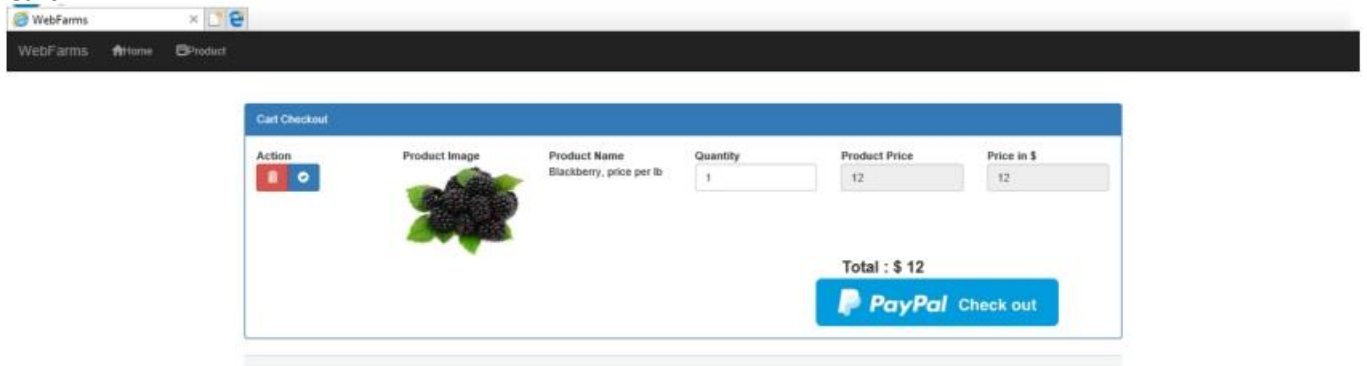
## Login:



The screenshot shows a web browser window with the title 'WebFarms'. The browser's address bar shows 'WebFarms' and the navigation bar includes 'home' and 'product' links. The main content area displays a 'Customer Login Form' with the following fields and values:

- Email:** (empty)
- Password:** (empty)


Below the password field, there are two links: 'Forgotten Password' and 'Create a new account?'. A green 'Login' button is located to the right of these links.

**Home Page:****Cart:**

**Checkout:**

PayPal Checkout - Review y... X

shoppingcart@webfarms.com



\$12.00 USD

Hi, Test! Not you?


Ship to

RAJASHEKARA J S GOWDA

banglore, kolar, banglore, Karnataka, 560100 India

Change ?

Pay with

 CREDIT UNIO... x-6586


Change ?

\$12.00

USD

View PayPal Policies and your payment method rights.

Pay Now



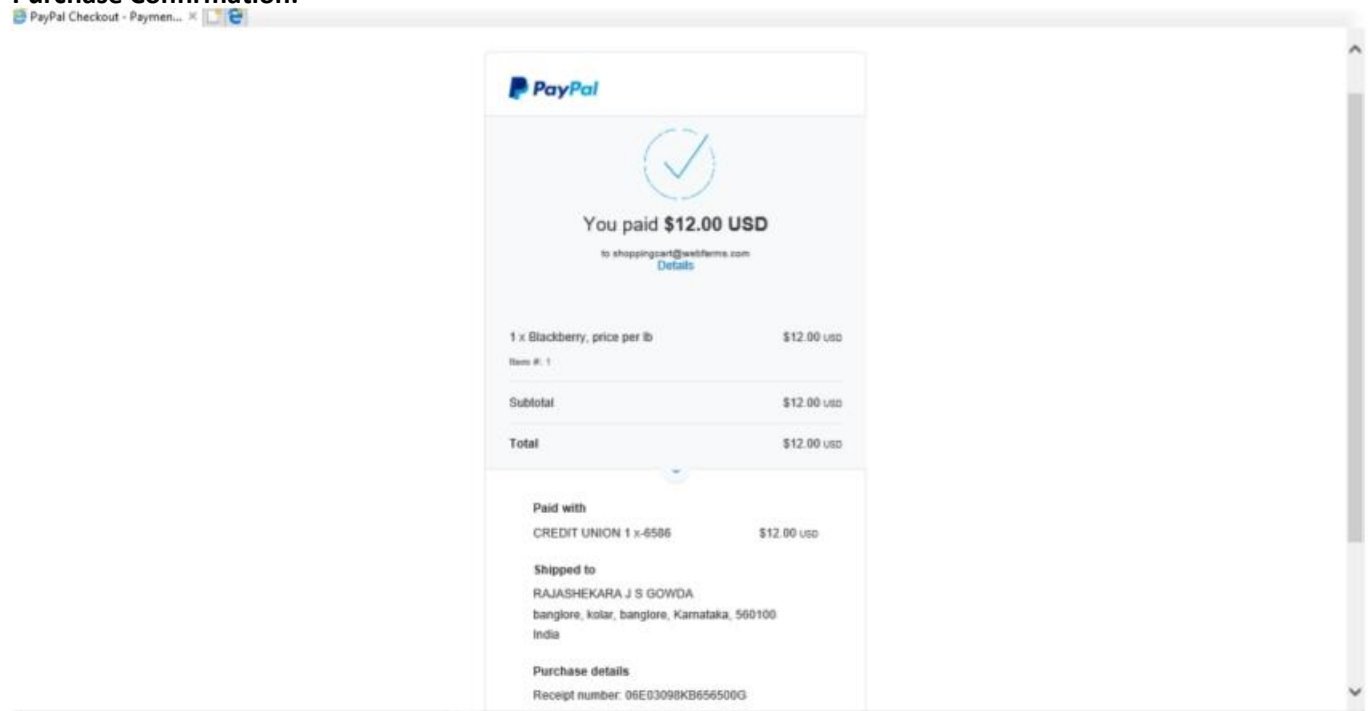
PayPal is the safer, easier way to pay

No matter where you shop, we keep your financial information secure.

Cancel and return to shoppingcart@webfarms.com

Policies Terms Privacy Feedback

© 1999 - 2017

**Purchase Confirmation:**

## Validations: Registration Page:



Email Address is already available Try Another email address

Customer SignUp Form

|                     |           |
|---------------------|-----------|
| First Name          | Last Name |
| arvind              | arvind    |
| Email               |           |
| arvind@webfarms.com |           |
| password            |           |
| *****               |           |
| Re-enter Password   |           |
| *****               |           |
| Mobile              |           |
| 9494949494          |           |
| Address Line 1      |           |
| Oak st              |           |
| Address Line 2      |           |
| KCMO                |           |

Sign Up



Email Address is already available Try Another email address

Customer SignUp Form

|                      |           |
|----------------------|-----------|
| First Name           | Last Name |
| arvind               | arvind    |
| Email                |           |
| arvind@intelagni.com |           |
| password             |           |
| *****                |           |
| Re-enter Password    |           |
| *****                |           |
| Mobile               |           |
| 9494949494           |           |
| Address Line 1       |           |
| Oak st               |           |
| Address Line 2       |           |
| KCMO                 |           |

Sign Up



The screenshot shows a web browser window with the title 'WebFarms'. The browser's address bar and navigation buttons are visible. A yellow error message banner at the top of the page reads: 'this arvind.com is not valid...!'. Below the banner is a 'Customer SignUp Form' with a blue header. The form contains the following fields and values:

- First Name:** arvind
- Last Name:** arvind
- Email:** arvind.com
- password:** [masked with asterisks]
- Re-enter Password:** [masked with asterisks]
- Mobile:** 9494949494
- Address Line 1:** Oak st
- Address Line 2:** KCMO

A green 'Sign Up' button is located at the bottom of the form.

The screenshot shows a web browser window with the title 'WebFarms'. The browser's address bar and navigation buttons are visible. A yellow error message banner at the top of the page reads: 'Mobile number dasdfdf is not valid'. Below the banner is a 'Customer SignUp Form' with a blue header. The form contains the following fields and values:

- First Name:** arvind
- Last Name:** arvind
- Email:** arvind@intelagni.com
- password:** [masked with asterisks]
- Re-enter Password:** [masked with asterisks]
- Mobile:** dasdfdf
- Address Line 1:** Oak st
- Address Line 2:** KCMO

A green 'Sign Up' button is located at the bottom of the form.

The screenshot shows a web browser window titled "WebFarms" with a navigation bar containing "WebFarms", "Home", and "Product". Below the navigation bar is a yellow error message box that reads "Mobile number must be 10 digit". The main content area displays the "Customer SignUp Form". The form fields are as follows:

| Field Label       | Value                |
|-------------------|----------------------|
| First Name        | arvind               |
| Last Name         | arvind               |
| Email             | arvind@intelagri.com |
| password          | *****                |
| Re-enter Password | *****                |
| Mobile            | 949494               |
| Address Line 1    | Oak st               |
| Address Line 2    | KCMO                 |

At the bottom of the form is a green "Sign Up" button.

The screenshot shows the same "WebFarms" browser window. The yellow error message box now reads "password is not same". The "Customer SignUp Form" is displayed with the following values:

| Field Label       | Value                |
|-------------------|----------------------|
| First Name        | arvind               |
| Last Name         | arvind               |
| Email             | arvind@intelagri.com |
| password          | *****                |
| Re-enter Password | *****                |
| Mobile            | 9494949494           |
| Address Line 1    | Oak st               |
| Address Line 2    | KCMO                 |

The "Sign Up" button remains at the bottom.



The screenshot shows a web browser window titled "WebFarms" with a navigation bar containing "WebFarms", "Home", and "Product". A yellow warning banner at the top states "Password is weak". Below this is the "Customer Sign Up Form". The form includes fields for "First Name" (arvind), "Last Name" (arvind), "Email" (arvind@webfarms.com), "password" (masked with asterisks), "Re-enter Password" (masked with asterisks), "Mobile" (sdfasdf), "Address Line 1" (Oak st), and "Address Line 2" (KCMO). A green "Sign Up" button is at the bottom of the form.

### Login Page:



The screenshot shows the "Customer Login Form" in the WebFarms browser window. It includes fields for "Email" (arvind@webfarms.com) and "Password" (masked with asterisks). Below the password field are links for "Forgotten Password" and "Create a new account?". A green "Login" button is positioned to the right of the "Forgotten Password" link. At the bottom, a red error message states "Please register before login. !".

## 9.About



## 10.Contact

# Contact us

Feel free to contact us

**Name**

**Email Address**

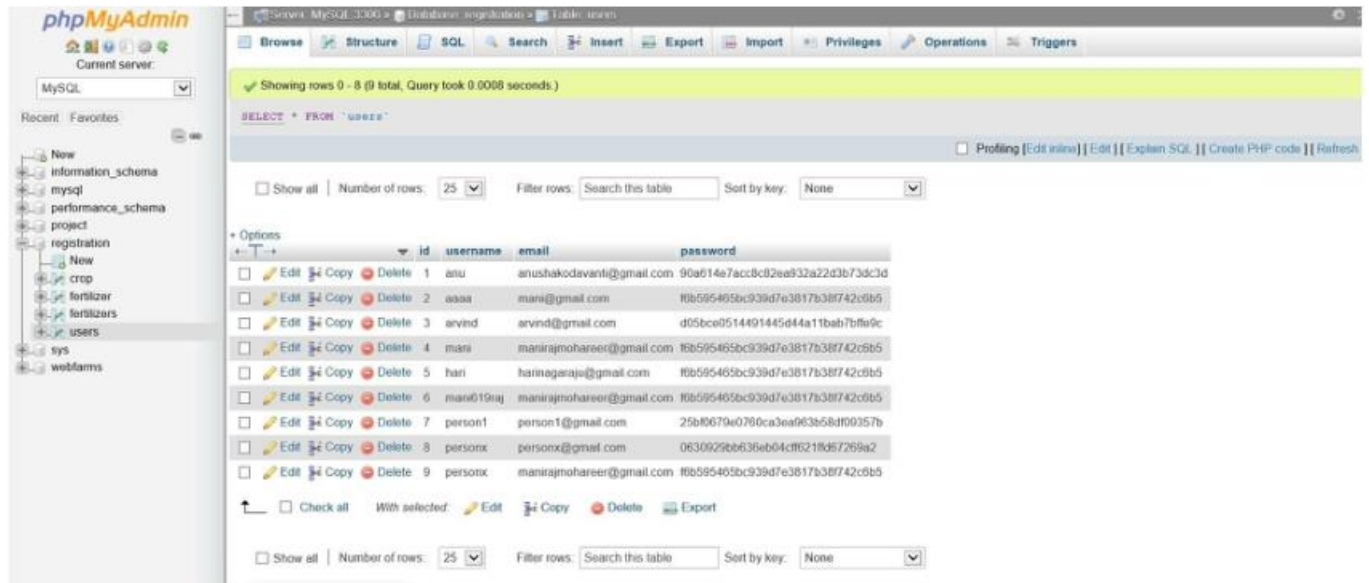
**Mobile No.**

**Message**

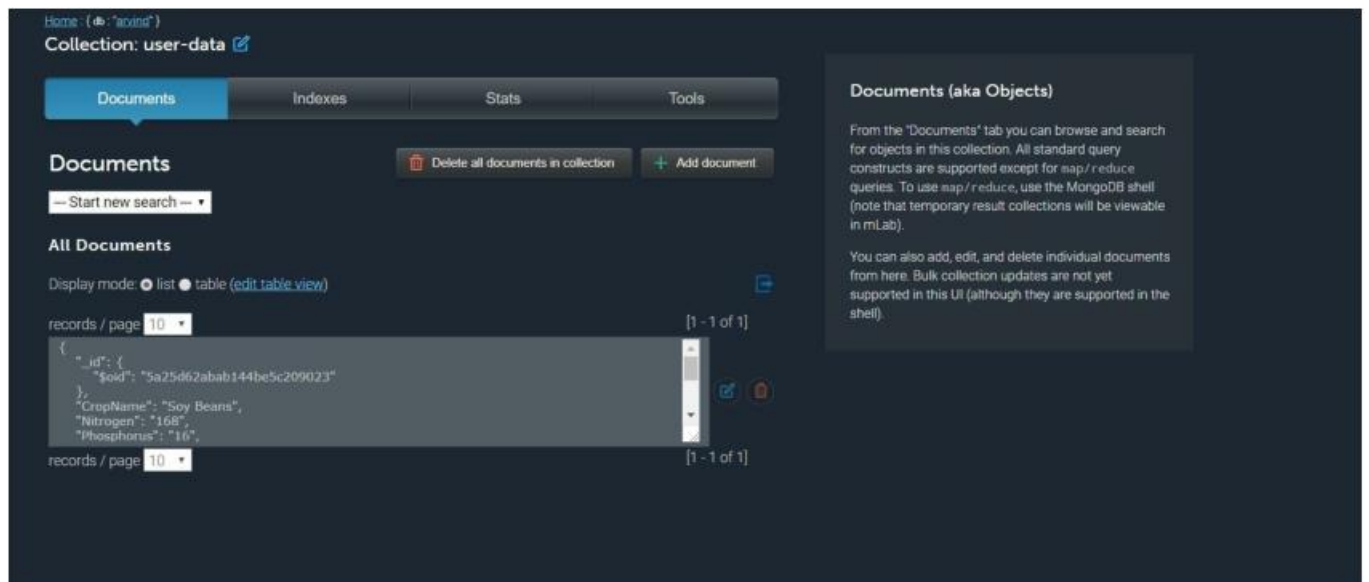
**Our Location**  
  

[www.webfarms.com](http://www.webfarms.com)  
5442 Harrison Street  
Phone +1 816-663-4246  
Email: [info@webfarms.com](mailto:info@webfarms.com)

## 11. WAMP User Data



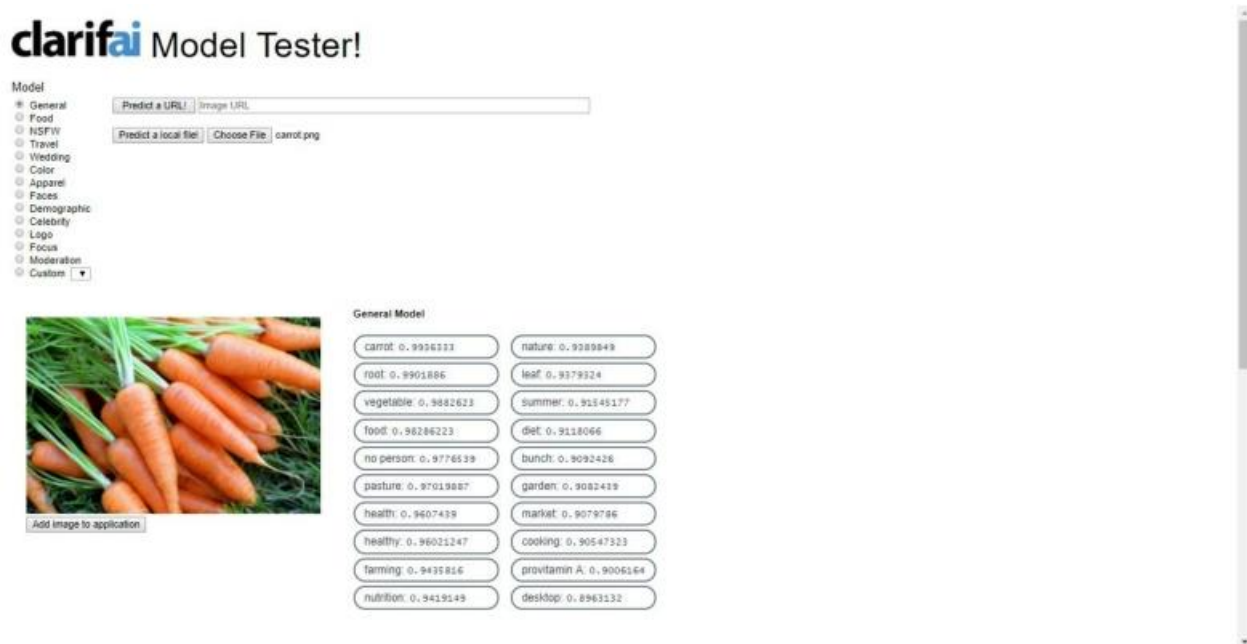
## 12. MLab



## 6. Clarifai API : Model Tester



## 7. Clarifai API Test: Uploading an Image from Local Storage



## 8. Clarifai API Test: Image from a URL

The screenshot shows the Clarifai Model Tester web application. The browser address bar displays the URL: `localhost:63342/Intelligent%20Agriculture/index.html?_ijt=id67mini8mgbmjeeef9558dpp9`. The page title is "clarifai Model Tester!". On the left, a sidebar lists various model categories: General, Food, NSFW, Travel, Wedding, Color, Apparel, Faces, Demographic, Celebrity, Logo, Focus, Moderation, and Custom. The "General" model is selected. The main area contains a "Predict a URL" input field with the value `https://s3.ap-south-1.amazonaws.com/zoom-blog-image/2016/04/mango.jpg`. Below this are buttons for "Predict a local file" and "Choose File" (with the text "No file chosen"). A small image of oranges is displayed on the left. To the right of the image, a "General Model" section lists 20 predictions in a grid, each with a label and a confidence score. The predictions are: fruit (0.99779344), pasture (0.95059526), leaf (0.99267113), color (0.93370104), no person (0.9903647), bunch (0.9336466), food (0.9671245), round out (0.91733754), grow (0.98516228), flora (0.9159632), nature (0.98166025), delicious (0.91145533), juicy (0.9800751), hanging (0.90862243), agriculture (0.9581052), summer (0.90565443), garden (0.9551654), crop (0.90345985), tree (0.953571), and branch (0.89547527). Below the image is a button labeled "Add image to application".

| General Model          |                       |
|------------------------|-----------------------|
| fruit: 0.99779344      | pasture: 0.95059526   |
| leaf: 0.99267113       | color: 0.93370104     |
| no person: 0.9903647   | bunch: 0.9336466      |
| food: 0.9671245        | round out: 0.91733754 |
| grow: 0.98516228       | flora: 0.9159632      |
| nature: 0.98166025     | delicious: 0.91145533 |
| juicy: 0.9800751       | hanging: 0.90862243   |
| agriculture: 0.9581052 | summer: 0.90565443    |
| garden: 0.9551654      | crop: 0.90345985      |
| tree: 0.953571         | branch: 0.89547527    |

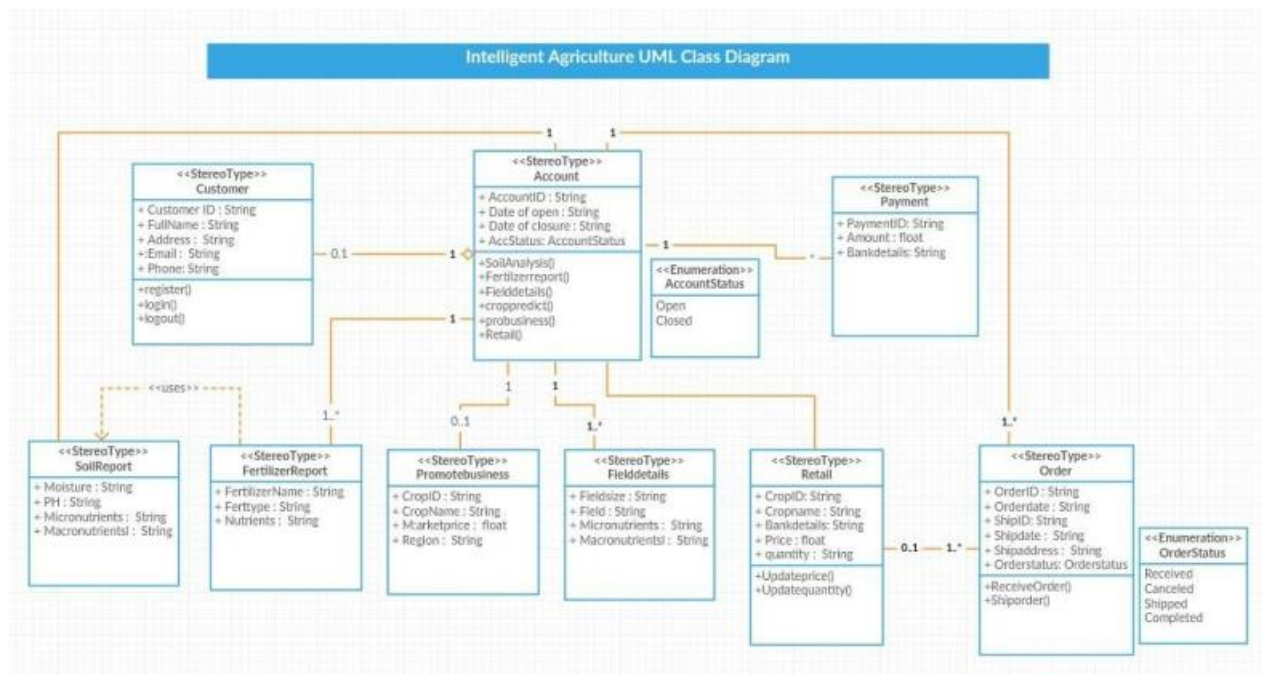
## 9. Weather API Working State

The screenshot shows the Weather API web application. The browser address bar displays the URL: `localhost:6100`. The page title is "Weather API". The main area displays weather information for "Kansas City, MO". The weather is "Overcast" with a temperature of "76.3°". Below this, a table lists various weather metrics: Temp: 76.3 F (24.6 C), Relative Humidity: 81%, Dewpoint: 70 F (21 C), Visibility: 10.0, and Heat Index: NA.

| Weather API            |  |
|------------------------|--|
| Kansas City, MO        |  |
| Overcast               |  |
| 76.3°                  |  |
| Temp: 76.3 F (24.6 C)  |  |
| Relative Humidity: 81% |  |
| Dewpoint: 70 F (21 C)  |  |
| Visibility: 10.0       |  |
| Heat Index: NA         |  |

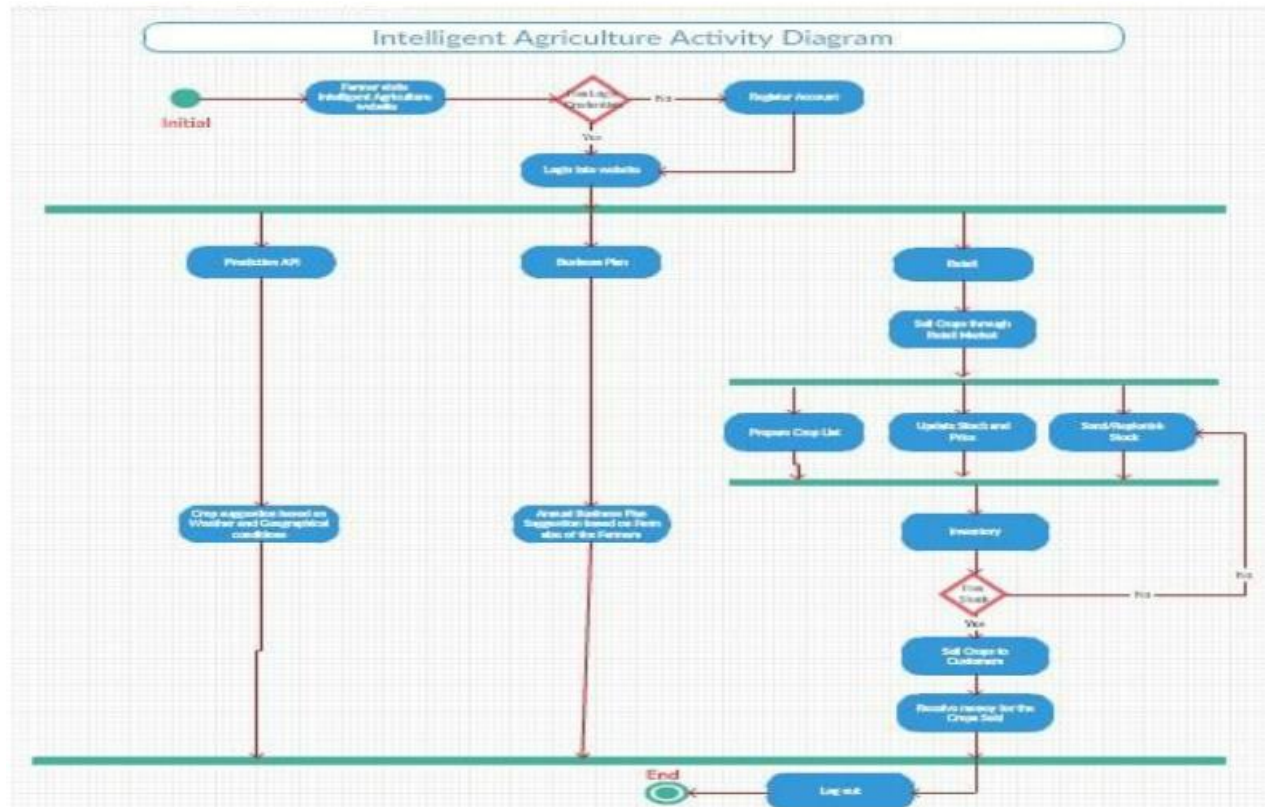
## 8. UML Diagrams

### Class Diagram

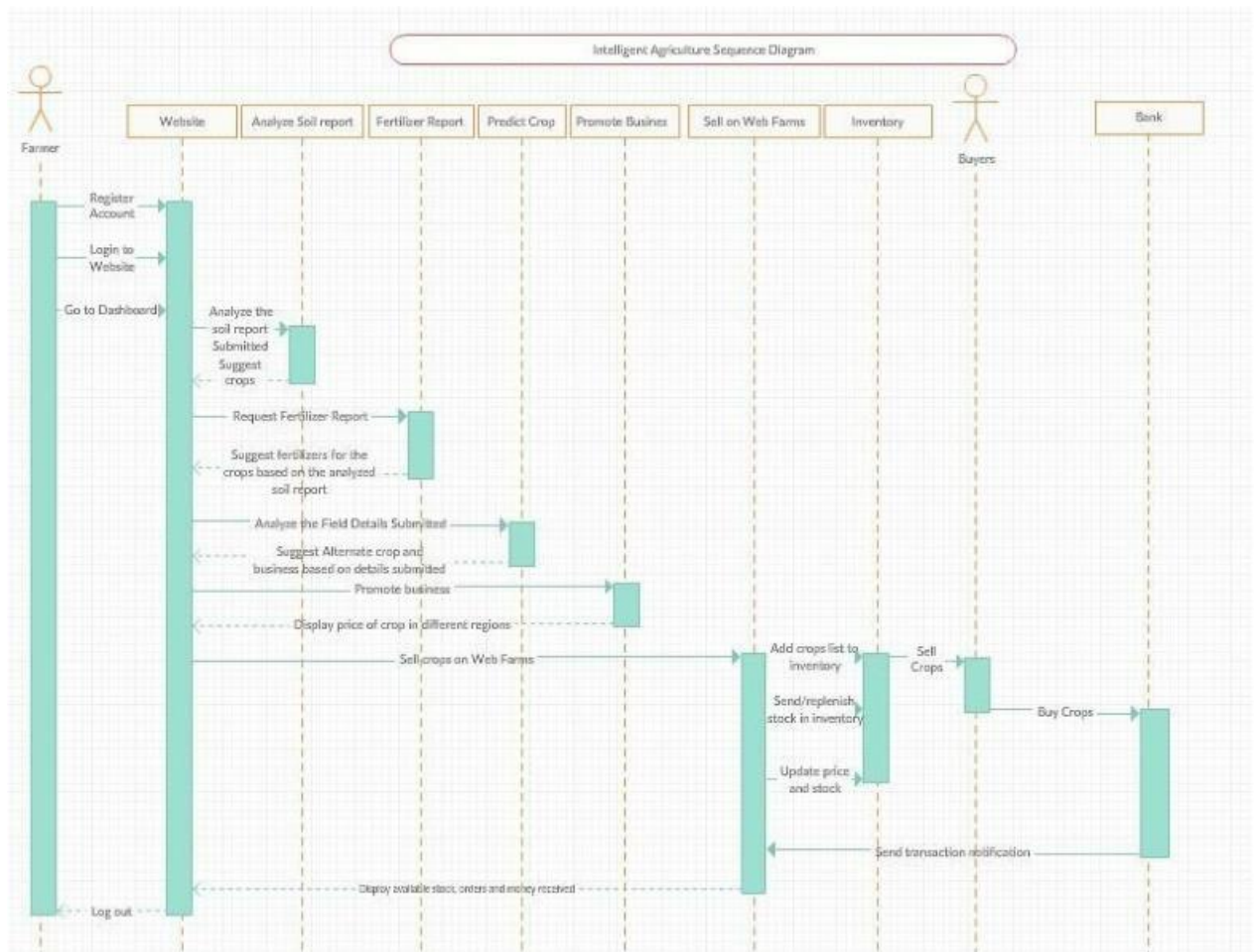




## Activity Diagram



### Sequence diagram



## 9. Unit Testing

| Serial Number | Test Case   | Outcome   | Result  |
|---------------|---|---|---------|
| 1             | Buttons   | Navigating between the pages  | Success |
| 2             | Local Storage Implementation                      | Successfully stored data  | Success |
| 3             | OAuth using Gmail                                 | Able to login w/o a flaw  | Success |
| 4             | OAuth using Facebook                              | Able to login   | Success |
| 5             | Interactive Dashboard                             | Flexible & Versatile Interface  | Success |
| 6             | Integrating Clarifai API to Web App.              | Able to detect the crop   | Success |
| 7             | Integrating Wunder Ground Weather API to Web App. | Could pull the weather info. Of a City in JSON Format   | Success |
| 8             | Building E Commerce                               | Farmers can add their crop details to the website and customers can purchase crops and pay using Paypal on the website. | Success |
| 9             | Database Storage Implementation                   | Successfully Stored Data  | Success |

## 10. Technologies Used

### i) **Widgets**

- Buttons, Text Fields, Images, Carousel, Navigation header, Sidebar, Divisions, Containers.

### ii) **API**

- Wonder Ground Weather Prediction API
- Clarify API
- Authentication using Google Account
- Authentication using Facebook Account
- Mlab DB API

### iii) **Tools Used:**

- Web Storm
- Creately
- Zen Hub
- Visual Studio Code
- WAMP Server
- Mlab

### iv) **Technologies Used:**

- HTML
- CSS
- Boot Strap
- AJAX/Java Script
- Apache Server
- MySQL Database
- PHP

## 11. Pre-proposal Report:

**Brain Storming:**

We have brain stormed about the project, its design, features and implementation.

**Assigned Tasks:**

We have discussed the main goal and objectives of the project and assigned the tasks for the project to each individual member.

**Features Disclosed:**

The main features like the nutrients required, crop health prediction, fertilizer report, sell on webfarms (ecommerce) Have been discussed.

## 12. First Increment Report:

### **Login and Register pages:**

We have created the login and register pages for the WebFarms page and the Ecommerce page. We have also added Google and Facebook OAuth for the login pages. We have also included the local storage for the pages.

### **Project Outline:**

We have concluded the project outline and started working on the project as per the outline.

### **Agile Implementation using Zenhub:**

Agile implementation of the project has been done using Zenhub, burndown charts were created.

### 13. Second Increment Report:

**Integrating APIs to Web Application:**

We have integrated the Clarifai API to the web application to predict crop health.

**E-Commerce Design:**

We have updated the design of the E commerce website.

**Dash board:**

An interactive dash board has been added which serves as a central hub for all the web pages in the project.

#### 14. Third Increment Report:

**Database Design:**

Database has been designed for the web pages in the project.

**E-Commerce Database Connection:**

Database connection has been established to the Ecommerce website.

**Database Integration:**

We have also integrated the database with the webpages in the project.



### 15. Fourth Increment Report:

**Fat Secret API:**

We have added the Fat Secret API to the project for analyzing the nutrients of the crops.

**Deployment and Testing:**

The project has been deployed and tested in this final increment.

**Ecommerce Implementation:**

The Paypal payment method has been added to the Ecommerce page and implemented.

## 16. Project Management:

The project is completed in four increments by a team of 4. The project responsibilities and individual members contribution can be observed below:

### **Project Responsibilities:**

Arvind Tota (40): Database management and integration, Mlab, SQL database, Ecommerce website.

Maniraj Mohareer (24): Database management and integration, Mlab, SQL database, Ecommerce website.

Sunil Kumar Madikanti (21): Documentation, Clarifai API, Fat Secret API, UI design and Dashboard.

Hari Naga Raju Velivela (44): Documentation, Clarifai API, Fat Secret API, UI design and Dashboard.

### **Project Contribution:**

Arvind Tota (40): 25%

Maniraj Mohareer (24): 25%

Sunil Kumar Madikanti (21): 25%

Hari Naga Raju Velivela (44): 25%

## 17. Bibliography

- [1] Analysis Of Soil Test Report: <https://www.uaex.edu/publications/PDF/FSA-2118.pdf>
- [2] Bootstrap Styling: <https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/js/bootstrap.min.js>
- [3] Fertilizers Required: <https://www.gardeners.com/how-to/fertilizer-ratios/5161.html> [4] Missouri Staple Crops: <http://crops.missouri.edu/covercrops/>
- [4] MongoDB Insert: <https://docs.mongodb.com/manual/reference/method/db.collection.insert/>
- [5] MongoDB update: <https://docs.mongodb.com/manual/reference/method/db.collection.update/>
- [6] MongoDB delete: <https://docs.mongodb.com/manual/tutorial/remove-documents/>
- [7] MongoDB query document: <https://docs.mongodb.com/manual/tutorial/query-documents/>
- [8] Soil fertility guide: [https://extension.umd.edu/sites/extension.umd.edu/files/\\_images/programs/anmp/PF-1.pdf](https://extension.umd.edu/sites/extension.umd.edu/files/_images/programs/anmp/PF-1.pdf)
- [9] Micro nutrient fertilizer details: <http://aes.missouri.edu/pfcs/research/prop115.pdf>

## 18. Project Links

**Youtube:**

<https://www.youtube.com/watch?v=TQwHxkUm6pY>

**Github:**

<https://github.com/Githubhari9966/ASE-PROJECT>

**PROJECT PPT:**

[https://drive.google.com/drive/folders/1HS8p6f0yD-hawa6f3LlP\\_XSZTPwQOQDN](https://drive.google.com/drive/folders/1HS8p6f0yD-hawa6f3LlP_XSZTPwQOQDN)

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