

E-FARMING

Undergone at

National Institute of Technology Karnataka

Under the guidance of

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Submitted By

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in partial fulfillment of the requirements for the award of the degree of

Bachelor of Technology

In

Computer Science & Engineering



Department of Computer Science and Engineering

National Institute of Technology Karnataka

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This is to certify that **Mothe Sravani and Vaishnavi Jerri** has worked on the project titled 'E-FARMING', under my guidance at the Computer Science and Engineering Department, National Institute of Technology Karnataka, Surathkal, as part of course project of Database Management System Lab(CO303).

DECLARATION

We certify that the report on 'E-Farming System' which is being submitted as record of our course project is a bonafide report of the work carried out by my team. The material contained in this report has not been submitted to any university or Institution for the award of any degree.

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Abstract

E-Farming is a distributed application, developed to provide a simple and easy way to trade agricultural products produced by the farmers and to educate farmers by providing information about proper cultivation methods. The application is maintained among the four stakeholders, admin, farmers, Agricultural Officer and customers. It provides guidance and maintains information about all cultivated crops of farmers, payment details of customers, climate and soil information suggested by agricultural officer for a particular crop. As it is user friendly, it is simple to understand by stakeholders and just asks the user to follow step by step operations by giving him options. To implement the project, some open source tools have been used such as XAMPP, CodeIgniter Framework, Apache as web server. The web programming language used to implement this project are HTML(Hypertext Markup Language), CSS(Cascading Style Sheets), JavaScript, JQuery and PHP. MySQL is used as database server. For further enhancement or development of this software, Newsfeed related to agriculture will be considered.

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Introduction

1.1 Purpose:

E-farming is an user friendly application that provides an simple way to trade agricultural products among the stakeholders. The main purpose of this application is to facilitate farmers by providing a platform to sell their products and to get guidelines during the cultivation about climate conditions, soil, fertilizers and pesticides from agricultural officer.

1.2 Objective:

The main objective of this project is building a website which will help farmers to sell their products. It is a computerized approach for better and clear marketing. This web site will provide a simple platform for farmers and customers to trade agricultural products and also guide farmers by providing information about climatic conditions, soil, fertilizers and pesticides so that they can reach maximum profits.

Requirement Analysis and specifications

The aim of the system is to develop “E-Farming” software, which should automate the trade process among the stakeholders. This software is a computerized approach for farmers to sell their products and get updates regarding climatic, soil conditions, pesticides, fertilizers etc. Therefore this proposed system must be able to function under all circumstances.

2.1 Software Requirements

Web Server:

We have used apache web server for deploying. Apache supports a variety of features, many implemented as compiled modules which extend the core functionality. These can range from authentication schemes to supporting server-side programming languages such as Perl, Python, Tcl and PHP.

DBMS:

We have chosen mysql as the development platform for database. The use of mysql helps in using php language for connecting web pages with database as backend development. Apache is provided with phpmyadmin which helps in database operations.

Other Development Software:

Windows 7 operating system, Windows 10 and Unix Operating systems.

Ms office pack for reports or any other documents.

Online tools like Erdplus, lucidchart for creating Er diagram, Relational Schema etc.

Text Editor like Sublime Text for writing the code.

2.2 Hardware Requirements:

Since we are not deploying our system for real as it is project we need not require any hardware requirements for as of now. But if at all it is deployed then we need to have reliable web server which is fast in all situation. Coming to database, the system must be able to run without interruption and able to handle thousands of concurrent requests. It must be able to effectively recover from crashes and other problems. The system will have to deal with large quantities of data and a large number of users accessing the data at once.

Database Design**3.1 ER Diagram**

This ER diagram represents the model of E-Farming entities. The entity-relationship diagram of E-Farming shows all the visual instruments of database and relationship among all the entities. The main entities of E-farming are Category, Crop, Process, info, Product, Place Order, Payment, Users.

Category

Attribute Name	Meaning	Value
Id	Primary key of the table	INT(11)
name	Category name of the users which indicates to which category the user belongs to.	VARCHAR(255)

Crop

Attribute Name	Meaning	Value
Id	Primary key of the table.	INT(11)
name	Name of the crop that farmer wants to cultivate.	VARCHAR(255)
user_id	Id of the user who owns this crop.	INT(11)

Process

Attribute Name	Meaning	Value
p_id	Primary key of the table	INT(11)
crop_id	The Id of the crop to which agricultural officer wants to suggest.	INT(11)
ao_id	The user Id of the agricultural officer who suggested for a crop.	INT(11)

info

Attribute Name	Meaning	Value
Id	Primary key of the table.	INT(11)
text	The information that agricultural officer wants to suggest for farmer for better cultivation.	TEXT
process_id	The Id of the table Process which gives information about which agricultural officer comments on which crop.	INT(11)

Product

Attribute Name	Meaning	Value
product_id	Primary key of the table.	INT(11)
seller_id	User Id of the farmer who is going to sell their crop.	INT(11)
product_name	Name of the product which farmer what to sell.	VARCHAR(255)
quantity	Quantity of product available.	INT(100)
quantity_selected _by_all_users	Quantity being consumed by buyers.	INT(11)

price	Price of the product to which seller want to sell.	FLOAT
product_desc	Description about the product which farmers want to sell.	TEXT
crop_image	Image of the product	VARCHAR(255)

Placeorder

Attribute Name	Meaning	Value
order_id	Primary key of the table	INT(11)
product_id	The Id of Product that we are going to place order.	INT(11)
buyer_id	User Id of the buyer who is going to buy the product.	INT(11)
quantity_selected	The quantity of which the buyer want to buy.	INT(11)
mode	Mode of transaction	INT(11)
date	Date and Time at which the order is placed.	TIMESTAMP
fullname	Name of the Buyer.	VARCHAR(255)
state	State of the buyer.	VARCHAR(255)
country	Country of the buyer.	VARCHAR(255)
Local_add	Address of the Buyer.	VARCHAR(255)

pincode	Pincode of the place of delivery.	VARCHAR(255)
contact	Phone number of the Buyer.	BIGINT(100)

Payment

Attribute Name	Meaning	Value
Buyer_id	The user Id of the Buyer who is going to buy products.	INT(11)
payment_id	Primary key of the table	INT(11)
cardname	Card Information to make payment.	VARCHAR(255)
cardnumber	Card Information to make payment.	VARCHAR(255)
expmonth	Card Information to make payment.	INT(11)
expyear	Card Information to make payment.	YEAR(4)
cvv	Card Information to make payment.	INT(11)
product_id	The Id of the product which the buyer is going to purchase.	INT(11)

Users

Attribute Name	Meaning	Value
Id	Primary Key of the table.	INT(11)
Firstname	First name of the user.	VARCHAR(255)
lastname	Last name of the user.	VARCHAR(255)
contact	Contact number of the user.	BIGINT(200)
email	Email address of the user.	VARCHAR(255)
localAddress	Local address of the user.	VARCHAR(255)
state	State of the user	VARCHAR(255)
country	Country of the user	VARCHAR(255)
pincode	Pincode of the area of the users	VARCHAR(255)
username	Username of the user	VARCHAR(255)
password	Password of the user	VARCHAR(255)
category_id	The Id indicates to which category(seller,admin,buyer, ag_officer) the user belong to.	TINYINT(4)
registered_date	Date and time at which the user registered.	TIMESTAMP

entity Category is to identify user to which category he/she belongs to i.e a buyer or a seller or an agricultural officer. As E-Farming is a multi user website the User is the entity in which information of all stakeholders is stored. Crop is the main entity where this website resides. This entity stores its related information which is accessed by all the stakeholders. Product is the entity which stores information about the products that are used for trade between buyers and sellers. The entity Payment which includes all the information related to payment details while purchasing a product.

The three stakeholders involved in our project have their own functionalities. A farmer can add the name of the crop to get suggestion from agricultural officer about the soil, climatic conditions, pesticides and fertilizers for the better cultivation of the crop. A farmer can put his products for sale in which a buyer can place order and get them by following the payment process.

- The type of relation between Category and User is 1:N. This is because each user has a category to which he/she belongs to. Many users can belong to one category.
- The relation adds between User and Crop is 1:N. This is because each user who belongs to seller category can be able to add crop name to get crop information from agricultural officer. A seller can add many crop names.
- The relation Process description between User and crop is M:N. This is because each user who belongs to agricultural officer category can be able to suggest methods for better cultivation of crops. A crop can be described by many agricultural officers.
- The relation adds between User and Product is 1:N. This is because each user who belongs to seller category can be able to put his/her crop products for sale.
- The relation Place order between Product and user is M:N. This is because each user who belongs to buyer category can place order for many products and each can be purchased by many buyers.
- The make relation between Users and Payment is 1:N. This is because each user who belongs to buyer category can make many payments. Each user can make many payments.
- The sold has relation between Product and Payment is 1:N. This is because each product can be purchased by many users which includes payments.

3.2 Relational Database design

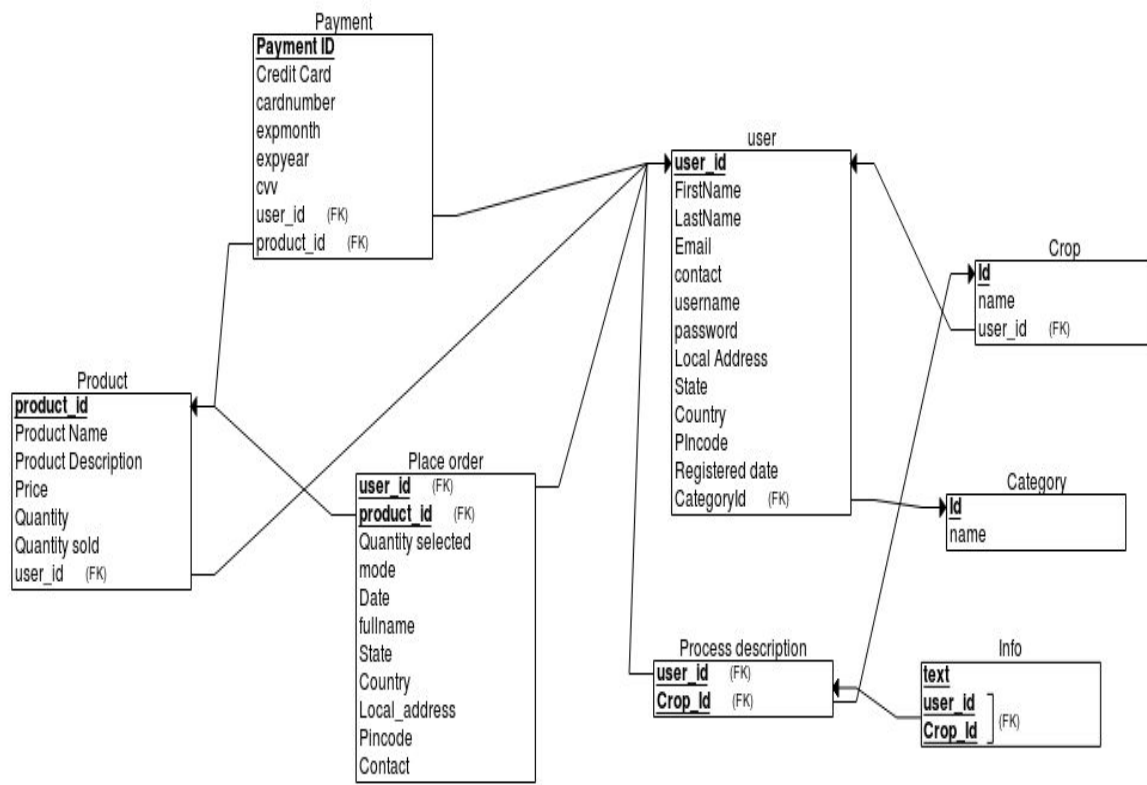


Fig.3.2.1 Relational schema diagram

There are total eight relations in our relational schema of E-Farming system. They are User, Crop, Category, info, ProcessDescription, Place order, Payment, Product. Each relation has its own attributes. All the entities mentioned in the er diagram are the relations and attributes of entities are the attributes for the relations in this relational schema.

As the relation between User and Category is N:1 we include the primary key of Category as a foreign key in User relation. The primary key of user is included in crop relation as a foreign key as the relation between User and Crop is 1:N. A process description relation is newly created as the relation between User and Crop is M:N. The primary key of User and Crop are included as foreign key in the process description table. As the Process description has a multivalued attribute a separate relation info is created which includes the primary key of process description and a text attribute. As the relation between User and

Product is 1:N, the primary key of User is included as a foreign key in the product relation. A Place Order relation is created as the relation between Product and user is M:N and this relation includes the primary key of Product and User as a foreign key. The User's Primary key is included as a foreign key in Payment relation as the relation between them is 1:N. As the relation between Product and Payment is 1:N the Primary key of Product is included as a foreign key in Payment relation.

3.3 Constraints in relational Schema

Key constraints:

Primary key is the one which identifies tuple in a relation. The relations Crop, category, User, Payment and Product have their own primary key which identifies tuples in a relation. The Primary key of Place order includes the Primary key of User and Product as the relation Place order is created because of the M:N relation between User and Product. The primary key of Process description includes the primary key of User and Crop as the relation process description is created because of the M:N relation between User and Crop. As the text in the process description is multivalued the primary key in the new relation info will include the primary key of Process description and text.

Cardinality Ratio:

Cardinality ratio indicates the relationship type between entities

The relationship type between

- Category and User = 1:N

Each user has a category to which he/she belong to. Many users can belong to one category.

- Seller and Crop = 1:N

This is because each user who belongs seller category can be able to add crop name to get crop information from agricultural officer. A seller can add many crop names.

- Agricultural Officer and Crop = M:N

This is because each user who belongs to agricultural officer category can be able to suggest methods for better cultivation of crops. A crop can be described by many agricultural officers.

- Seller and Product = 1:N

This is because each user who belongs to seller category can be able to put his/her crop products for sale.

- Product and Buyer = M:N

This is because each user who belongs to buyer category can place order for many products and each can be purchased by many buyers.

- Buyer and Payment = 1:N.

This is because each user who belongs to buyer category can make many payments. Each user can make many payments.

- Product and Payment = 1:N

This is because each product can be purchased by many users which includes payments.

Participation constraints:

User-Category

User:Full Participation since every user belongs to a category

Category: Full Participation because each category has users.

Seller-Crop

Seller:Full Participation because a seller should be there for a crop to exist.

Crop:Partial Participation because it is an option for a seller to add crop name.

Agricultural Officer-Crop

Agricultural Officer:Partial Participation because is the choice of agricultural officer to suggest for a crop.

Crop:Full Participation because a crop should exist first for an agricultural officer to describe about.

Product-Seller

Product:Partial Participation because it is the choice of the seller to keep product for sale.

Seller:Full Participation because a product put for sale should correspond to some seller.

Payment-Product

Payment:Full Participation because Payment is needed for every product which is purchased.

Product:Full Participation because every payment corresponds to a product purchased.

Product-Buyer

Product:Partial Participation because it is the choice of the buyer to purchase a product.

Buyer: Full Participation because every product purchased corresponds to a buyer.

Payment-Buyer

Payment: Partial Participation because it is the choice of the Buyer to make a payment for a product.

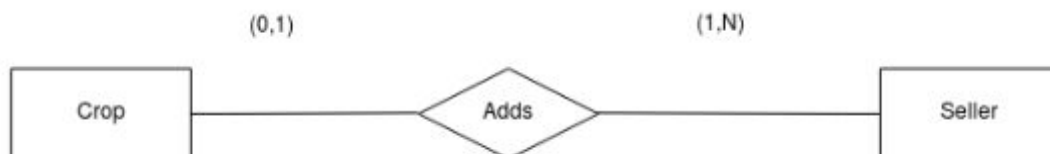
Buyer: Full Participation because for every payment made for a product there will be a buyer corresponding to it.

Structural Constraints:

User-Category



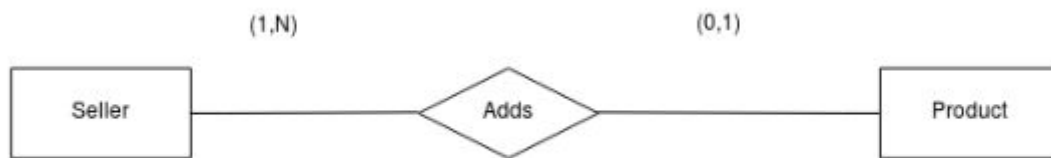
Crop-Seller



Agricultural Officer-Crop



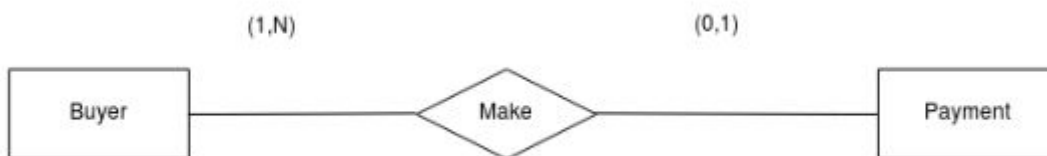
Seller-Product



Product-Buyer



Buyer-Payment



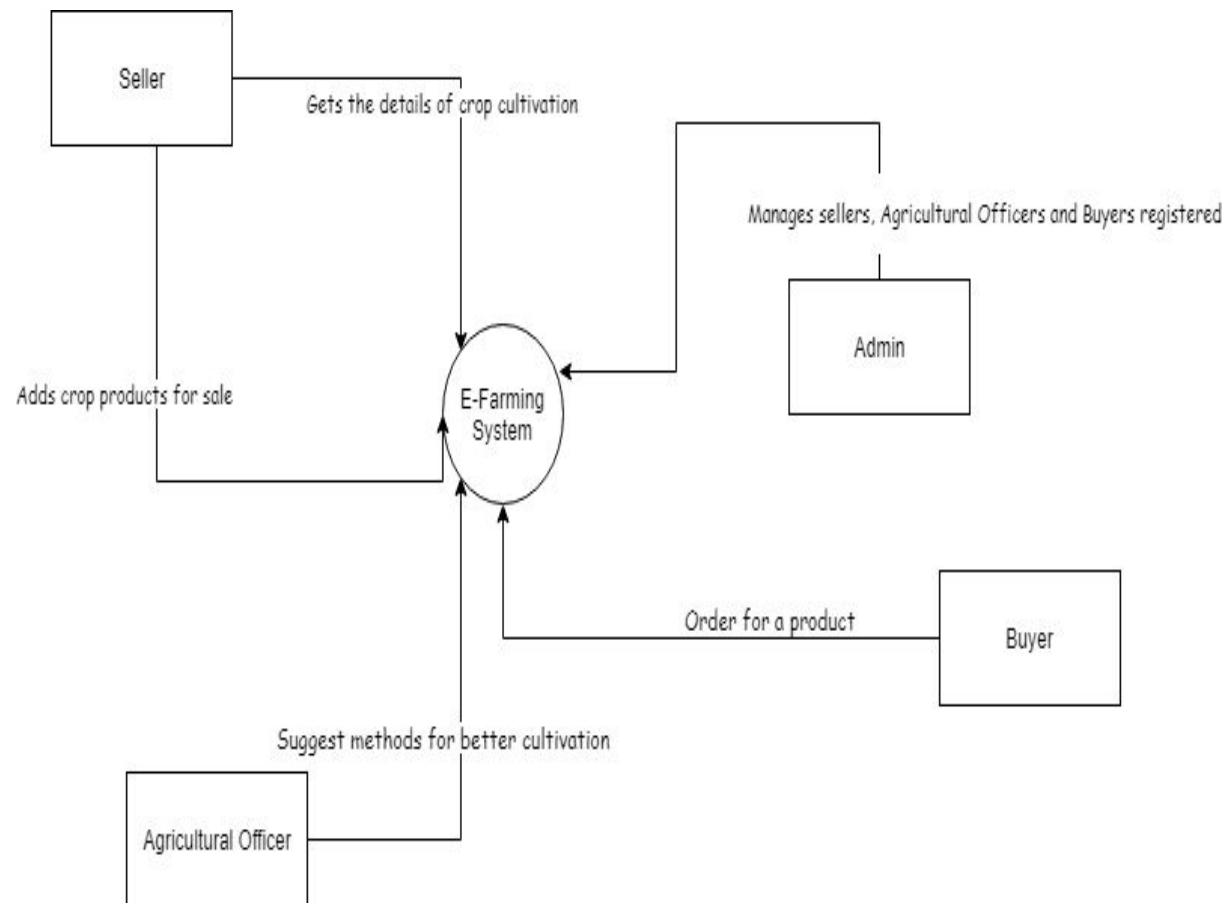
Product_Payment



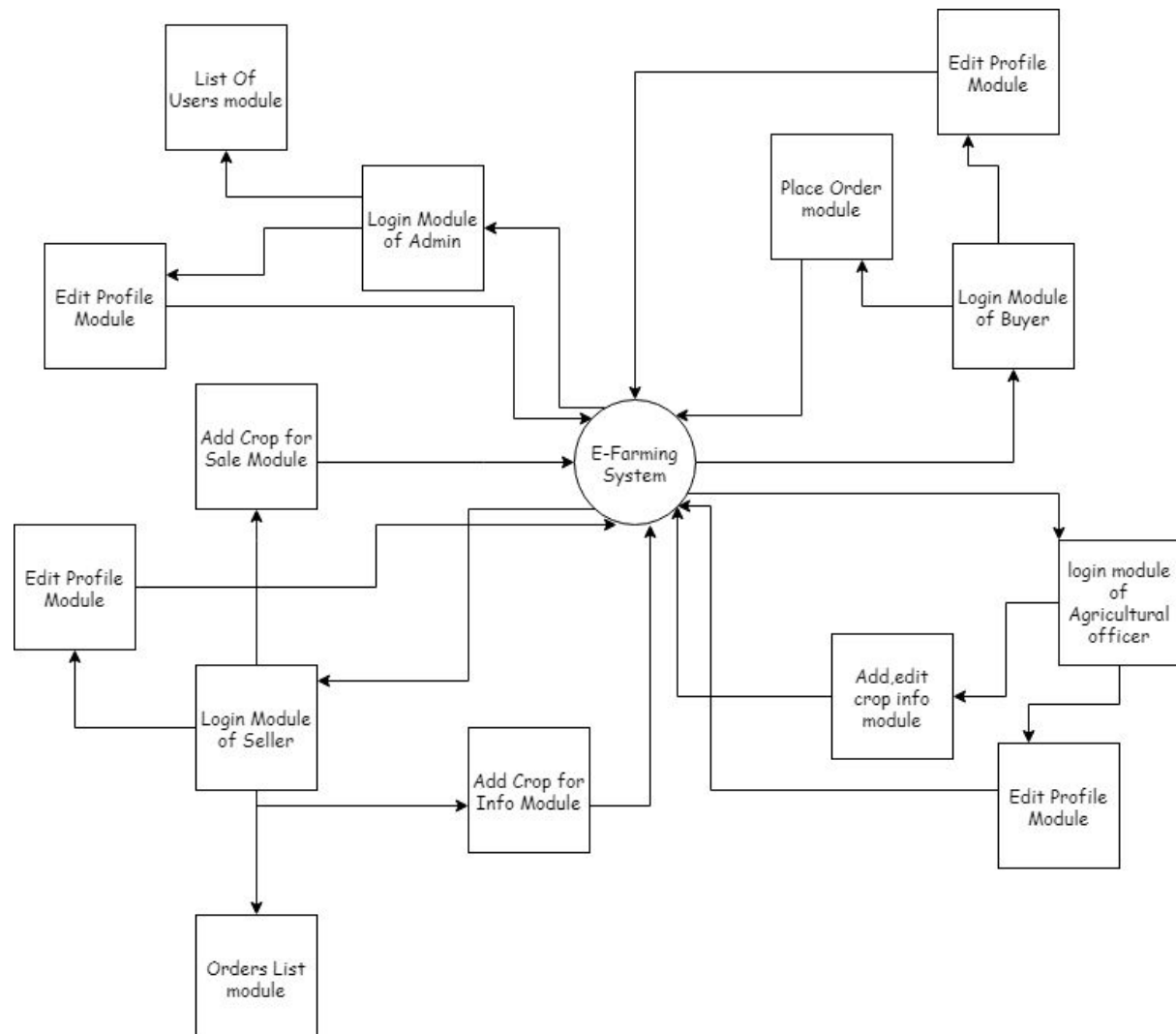
Project Components

4.1 Front End Design

We have used html,css for the front end design



Pictorial notation of modules



Login Module:

Since our's is a multiuser website we have four login modules. They are for Seller, Buyer, Agricultural Officer, Admin. For all of them to login, they need to use their credentials particularly Username and password. There are two text boxes in this module particularly for username and password. A login button is also provided to submit the credentials for authentication.

Edit Profile Module:

All the stakeholders are provided with a edit profile module where they can edit their profile.

Add Crop for Info Module:

A seller can add name of a crop to get information from a agricultural officer. An agricultural Officer can suggest methods for better cultivation to the crop names added by seller. A seller user can even be able to view the suggestions posted for the crop names added by other seller users.

Add Crop for Sale Module:

If a seller wants to put his crop products for sale then he/she can add the details of the product that want to put for sale. Seller is even given an option to edit the stock value of product.

Order List Module:

Seller can keep track of the products that he has put for sale in this module. He can get information about the orders placed on his product in this module.

Place Order Module:

Buyer can be able to view all the products put for sale by all the sellers. He/she can place order according to the quantity he/she needed. A buyer can purchase a product by following payment process where a option is provided to select between card payment and cash on delivery.

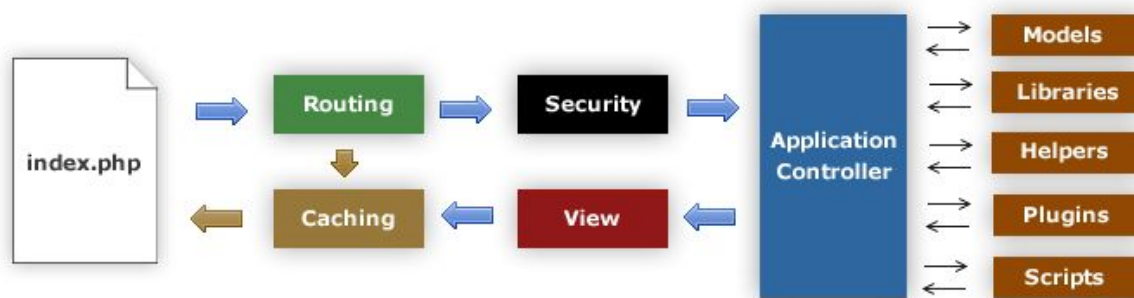
Add and Edit Crop Info Module:

This module is for an agricultural officer where he can suggest methods for better cultivation of crops. He can even be able to view suggestions made by other agricultural officers. He is given option to edit his suggestions for a crop.

Framework:

This project is done using CodeIgniter framework. CodeIgniter is an Application Development Framework to develop websites using PHP. Its goal is to enable you to develop projects much faster than you could if you were writing code from scratch, by providing a rich set of libraries for commonly needed tasks, as well as a simple interface and logical structure to access these libraries. CodeIgniter lets you creatively focus on your project by minimizing the amount of code needed for a given task. CodeIgniter is based on the Model-View-Controller development pattern. MVC is a software approach that separates application logic from presentation.

The following graphic illustrates how data flows throughout the system:



1. The index.php serves as the front controller, initializing the base resources needed to run CodeIgniter.
2. The Router examines the HTTP request to determine what should be done with it.
3. If a cache file exists, it is sent directly to the browser, bypassing the normal system execution.
4. Security. Before the application controller is loaded, the HTTP request and any user submitted data is filtered for security.
5. The Controller loads the model, core libraries, helpers, and any other resources needed to process the specific request.
6. The finalized View is rendered then sent to the web browser to be seen. If caching is enabled, the view is cached first so that on subsequent requests it can be served.

4.2 Security Measures

1. XSS Filtering

Codeigniter comes with a Cross Site Scripting prevention filter, which looks for commonly used techniques to trigger JavaScript or other types of code that attempt to do

malicious things. If anything disallowed is encountered it rendered safe by converting the data to character entities. The lines of code edited are:

```
$config['global_xss_filtering'] = TRUE;  
$autoload['helper'] = array('url','form','security');
```

2. CSRF Token

CSRF stands for cross-site request forgery. We can prevent this attack by enabling it in the application/config/config.php file as shown below.

```
$config['csrf_protection'] = TRUE;
```

In codeigniter, while creating form using form_open() function, it will automatically insert a CSRF as hidden field

3. Defined BASEPATH

Each .php file in CodeIgniter is protected with the line on the top.

```
<? php if ( ! defined('BASEPATH')) exit('No direct script access allowed');
```

This ensures that the PHP file is not accessible directly by manipulating or running a script, All requests should go through index.php, which is where BASEPATH gets defined.

That line prevents them from accessing something like
http://yoursite/application/models/some_model.php
via the URL and directly accessing the model, library, whatever.

4. Password Encryption

Password entered by the user during registration is encrypted using md5.

Results & Discussion

1 Home Page



As the user opens the website the first thing he observes is the home page.

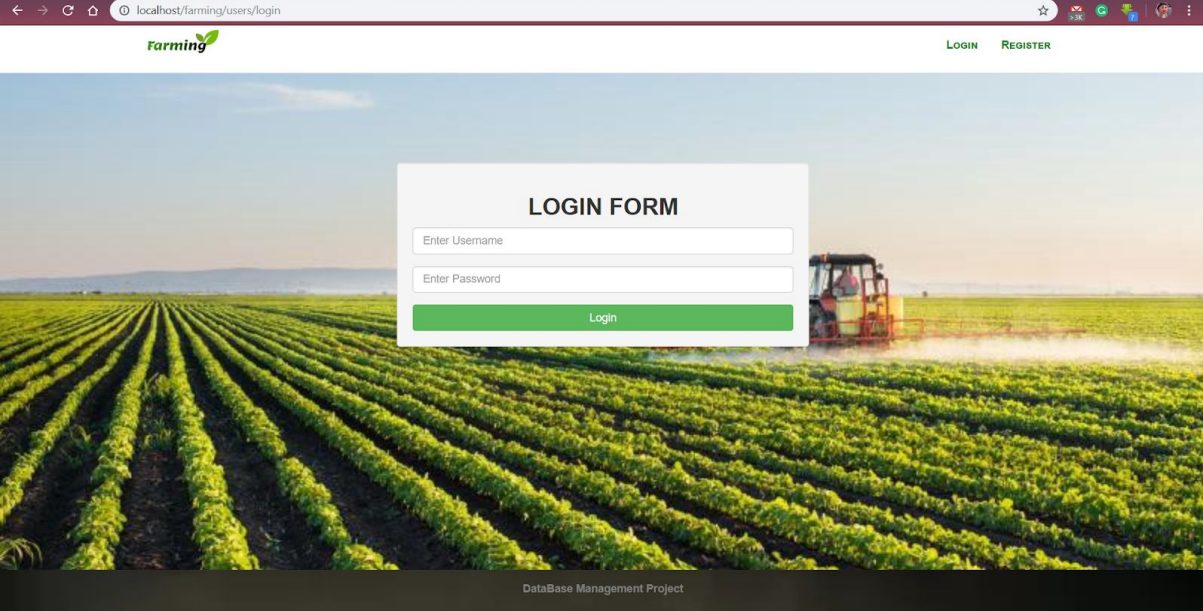
The home page consists of logo at top right corner. With some pictures as slideshow indicating the theme of the website .

2. Sign Up Form

A screenshot of the 'SIGN UP FORM' on the Farming website. The browser's address bar shows 'localhost/farming/users/register'. The form is titled 'SIGN UP FORM' and is set against a background image of a green field. The form includes several input fields and a 'Submit' button. The fields are organized as follows: 'Sign up as' with radio buttons for 'AGRICULTURAL OFFICER', 'SELLER', and 'BUYER'; 'First Name' and 'Last Name' text boxes; 'Email' text box; 'Local Address' text box; 'State' text box; 'Country' text box; 'Pincode' text box; 'Username' text box; 'Password' text box; and 'Password Confirmation' text box. A green 'Submit' button is at the bottom of the form. The 'Farming' logo and 'LOGIN'/'REGISTER' links are visible at the top. The text 'DataBase Management Project' is at the bottom.

The Home page show two buttons for signup and login. The above figure is the signup form of the users where users provide their information and select the category among agricultural officer, seller and buyer.

3.Login Form



The screenshot displays the login interface of the E-Farming System. The browser's address bar shows the URL `localhost/farming/users/login`. The page features a green header with the "farming" logo on the left and "LOGIN" and "REGISTER" links on the right. The main content area has a background image of a vast agricultural field with rows of crops and a tractor in the distance. Overlaid on this is a white "LOGIN FORM" box. Inside the box, there are two input fields: "Enter Username" and "Enter Password". Below these fields is a prominent green button labeled "Login". At the bottom of the page, a dark footer contains the text "DataBase Management Project".

The above figure shows the login form of all the users. By providing the essential credentials they can navigate to their respective home pages.

4.Seller Home Page

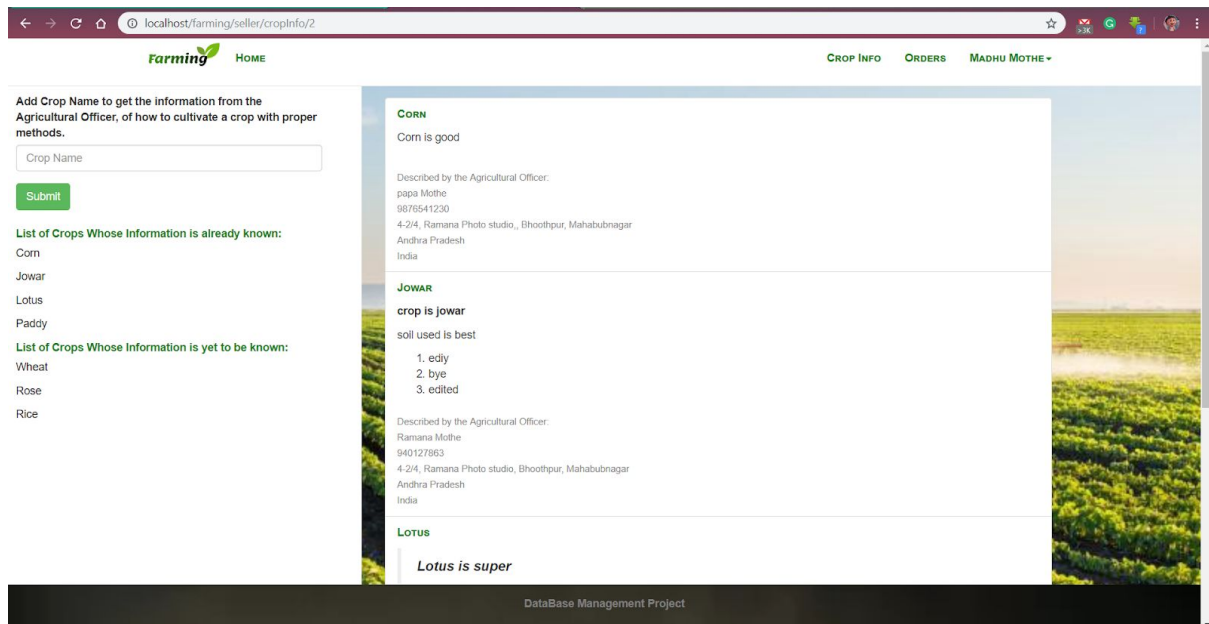
The screenshot displays the 'farming HOME' interface. On the left, there is a form titled 'Add Crop For Sale' with fields for 'Product Name(Crop)', 'Quantity', 'Enter Price Per Quantity', and 'Product Description'. Below the form is an 'Upload Image' section with a 'Choose File' button and a 'submit' button. The main content area shows a list of crops for sale:

- Rose**: Stock Left: 1313, Price Per Quantity: 5. Product Description: Rose Water Is A Flavoured Water Made By Steeping Rose Petals In Water. Additionally, It Is The Hydrosol Portion Of The Distillate Of Rose Petals, A By-Product Of The Production Of Rose Oil For Use In Perfume. Increase Or Decrease stock value: 1313.
- Corn**: Stock Left: 338, Price Per Quantity: 50. Product Description: Jki. Increase Or Decrease stock value: 338.
- Wheat**: Stock Left: 875, Price Per Quantity: 20. Product Description: Wheat Is A Grass Widely Cultivated For Its Seed, A Cereal Grain Which Is A Worldwide Staple Food Since 1860, World Production Of

The navigation bar at the top includes links for 'CROP INFO', 'ORDERS', and 'MADHU MOTHE'. The footer mentions 'DataBase Management Project'.

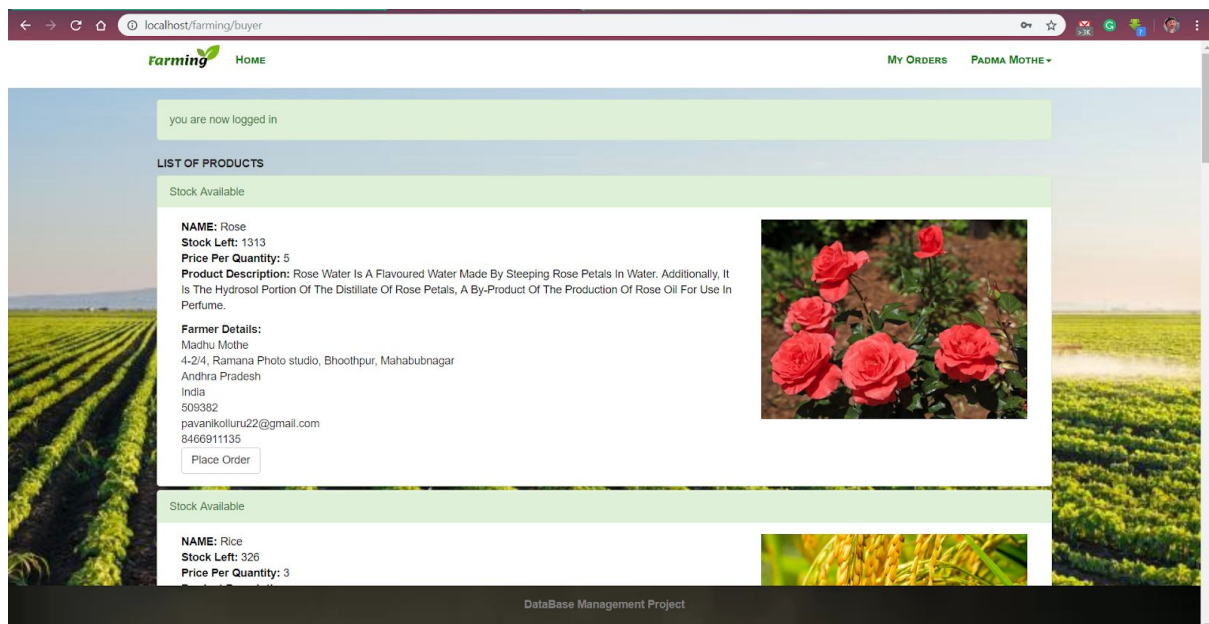
This is the home page of seller where he gets a form to add products for sale by providing the required information. Seller can view the list of all the crop products that he had put for sale. He can even edit the stock information of the products. Two links crop info and Orders are provided in the navigation bar which navigate to other pages.

5.Seller Crop Info page



Crop info Page provides list of crops which are posted by agricultural officer. In this page seller can view all the methods suggested by agricultural officer for better cultivation of crops. And a form is provided so that seller can add a crop name to get suggestions from agricultural officer.

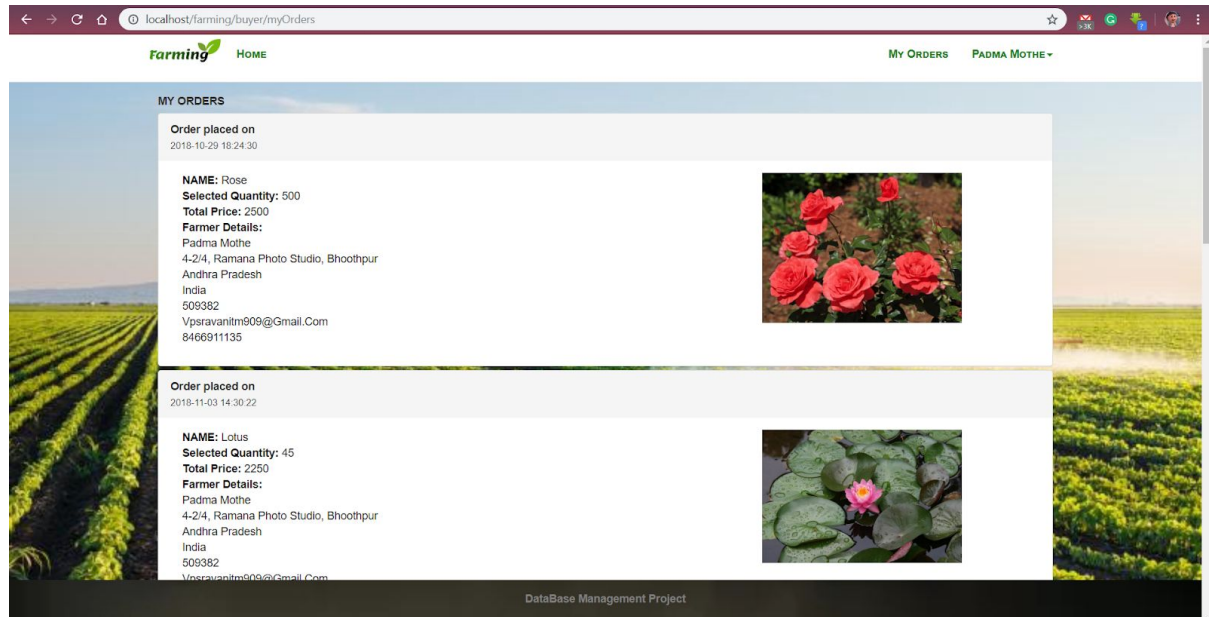
6.Buyer Home page



Buyer can be able to view all the products put for sale by all the sellers. He/she can place order according to the quantity he/she needed. A buyer can purchase a product by following

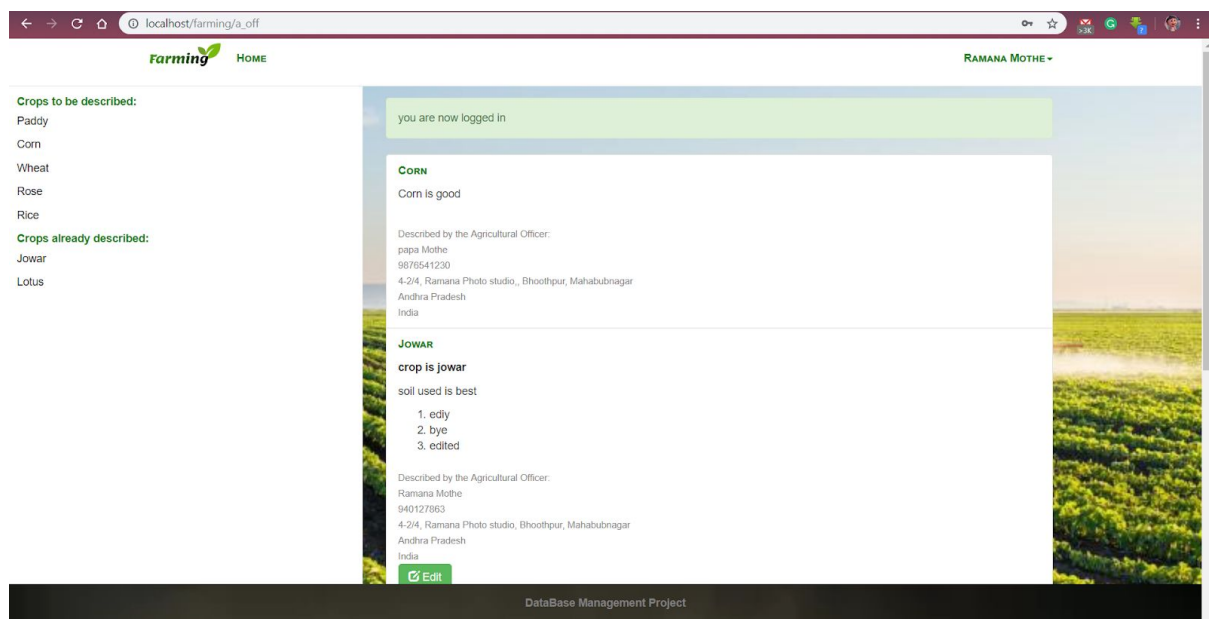
payment process where a option is provided to select between card payment and cash on delivery.

7. Buyer orders Page



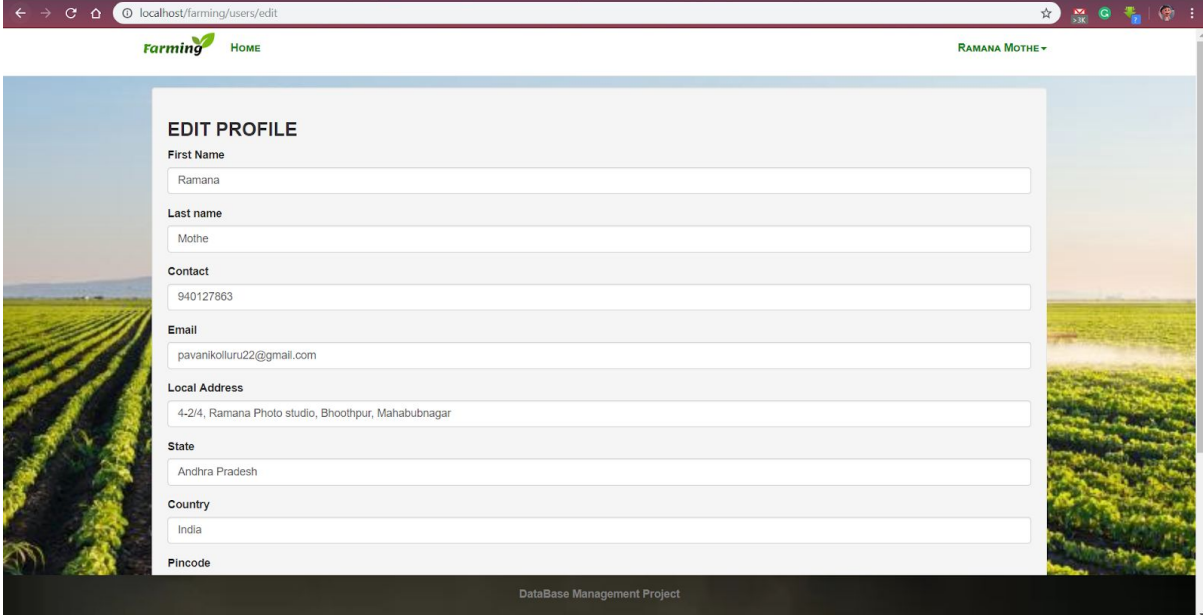
This Page gives information about all the products purchased by a particular user.

8. Agricultural Officer Page



This page is the home page of agricultural officer where he can suggest methods for better cultivation of crops. He can even be able to view suggestions made by other agricultural officers. He is given option to edit his suggestions for a crop.

9.Edit Profile Page



The screenshot displays the 'EDIT PROFILE' page of the E-Farming System. The page is titled 'EDIT PROFILE' and contains a form with the following fields:

- First Name:** Ramana
- Last name:** Mothe
- Contact:** 940127863
- Email:** pavanikolluru22@gmail.com
- Local Address:** 4-2/4, Ramana Photo studio, Bhoothpur, Mahabubnagar
- State:** Andhra Pradesh
- Country:** India
- Pincode:**

The page also features a 'HOME' link in the top navigation bar and a user profile dropdown menu showing 'RAMANA MOTHE'. The background of the page is a green field with rows of crops.

All the stakeholders are provided with a edit profile module where they can edit their profile.

CONCLUSION

This project helps to reduce the manual method and stress which is done by a person and that is time consuming and lengthy process. This web site provides an easy way to trade agricultural products among stakeholders. It facilitates farmers by providing a platform to sell products which reduce manual work. It also updates farmers with climatic conditions, soil, fertilizers, pesticides and new technologies so that they can reach maximum profits.