

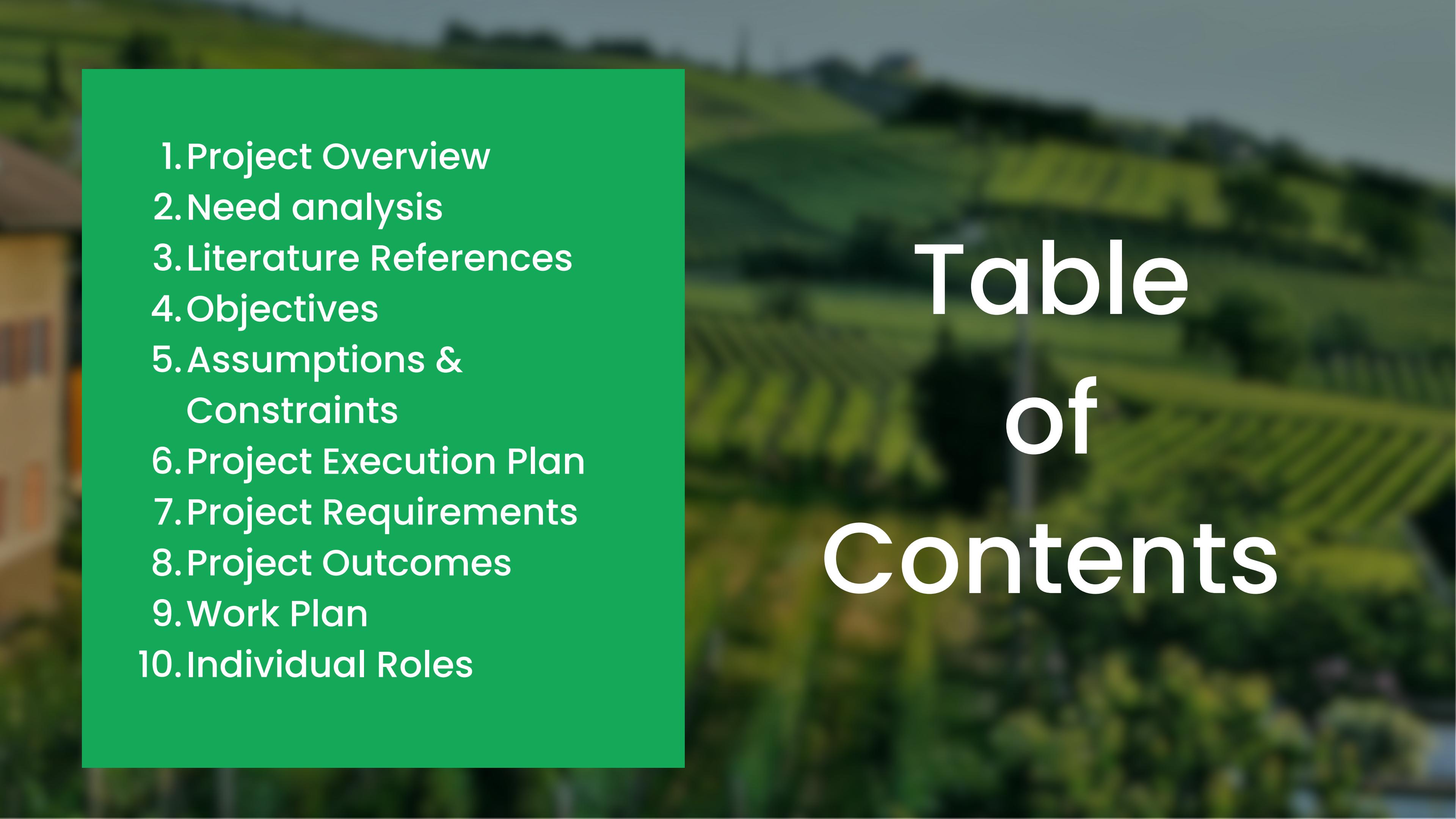
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Project Overview

- Bridging the gap between Farmers and Consumers closer with a perfect fusion of Machine Learning and Web Development.
- A smart ecommerce platform that can give the farmers the actual price for their crops.
- A platform that has the potential to revolutionize the agriculture industry by empowering farmers to connect directly with consumers.
- We aim to remove the middlemen or the brokers.

OUR AIM
NO MORE
MIDDLEMEN

But Why?

Need Analysis

Farm Laws - 2020 raised some valid points for the benefit of Farmers.

The laws got repealed, but a major issue of middlemen increasing the overall price of goods and giving a little amount to the farmers was raised. So there is a need for an apt solution for the following issues:



Poor Crop Valuation

The money that farmers get for their crops is way too less than what they should be getting.



Industry's changing behaviour

Markets are inclining towards quality-based tools. This determined an idea to make a e-commerce site along with ML Algorithms.



Fair Pricing

The Consumers should pay the price for the exact quality of the crop that they are purchasing directly from the farmer.



Improve food safety

The Consumers should get the quality and disease free assurance for the items that they purchase.

Literature References

- 1."Seed Quality Prediction using Computer Vision and Convolutional Neural Networks" by M. Sobhana et al.
- 2."Machine learning approach for the classification of corn seed using hybrid features" by Aqib Ali et al.
- 3."An Approach Towards E-Commerce for Agriculture with Modern Technologies" by Patel et al.
- 4."Architecture of next-generation e-commerce platform" by Y. Huang at al.
- 5."A case-based distance approach to agricultural product's vendor evaluation in e-commerce" by HaiXan et al.

Seed Quality Prediction

- The given papers showed us that it is necessary to predict the seed quality.
- To detect pure and damaged seeds without human intervention, Computer Vision and Deep Learning techniques can be used.
- We aim to propose a model that uses OpenCV to detect each seed grain in the seed lot and a convolutional neural network to predict the quality of the detected seed grain.
- The seed quality will be measured on the basis on features of crop seeds like size, texture, species, color, fertility of soil and environment .

Problem Statement

Without standard markets, farmers have to sell his produce to customers at lower rates than MSP. Standard markets don't provide flexibility for better leverages and negotiations desired for healthy business. This creates the need for a system with features of both standard and leveraged markets.

“TO DEVELOP A MACHINE LEARNING-BASED E-COMMERCE SYSTEM TO CLASSIFY THE CROPS BASED ON THEIR QUALITY AND PREDICT THE PRICE.”

Objectives

- To study the available techniques and approaches of machine learning in crop quality classification.
- To find a relevant dataset (images) for training the model.
- To propose and develop the optimal technique for crop quality classification and price prediction.
- To develop a multi-modular, user-friendly ecommerce application.



Assumptions

- **Homogeneity of the seed sample:** The assumption that the seed sample used for quality prediction is homogeneous in terms of its genetic makeup, physiological age, and storage conditions.
- **Correct Input By Farmer:** The assumption that the farmer will give correct images of the sample that he is providing and the correct textual information that will be used in quality predictions.
- **Correlation of Features:** The classification features have no interdependence on each other and thus correlation coefficient value of zero.

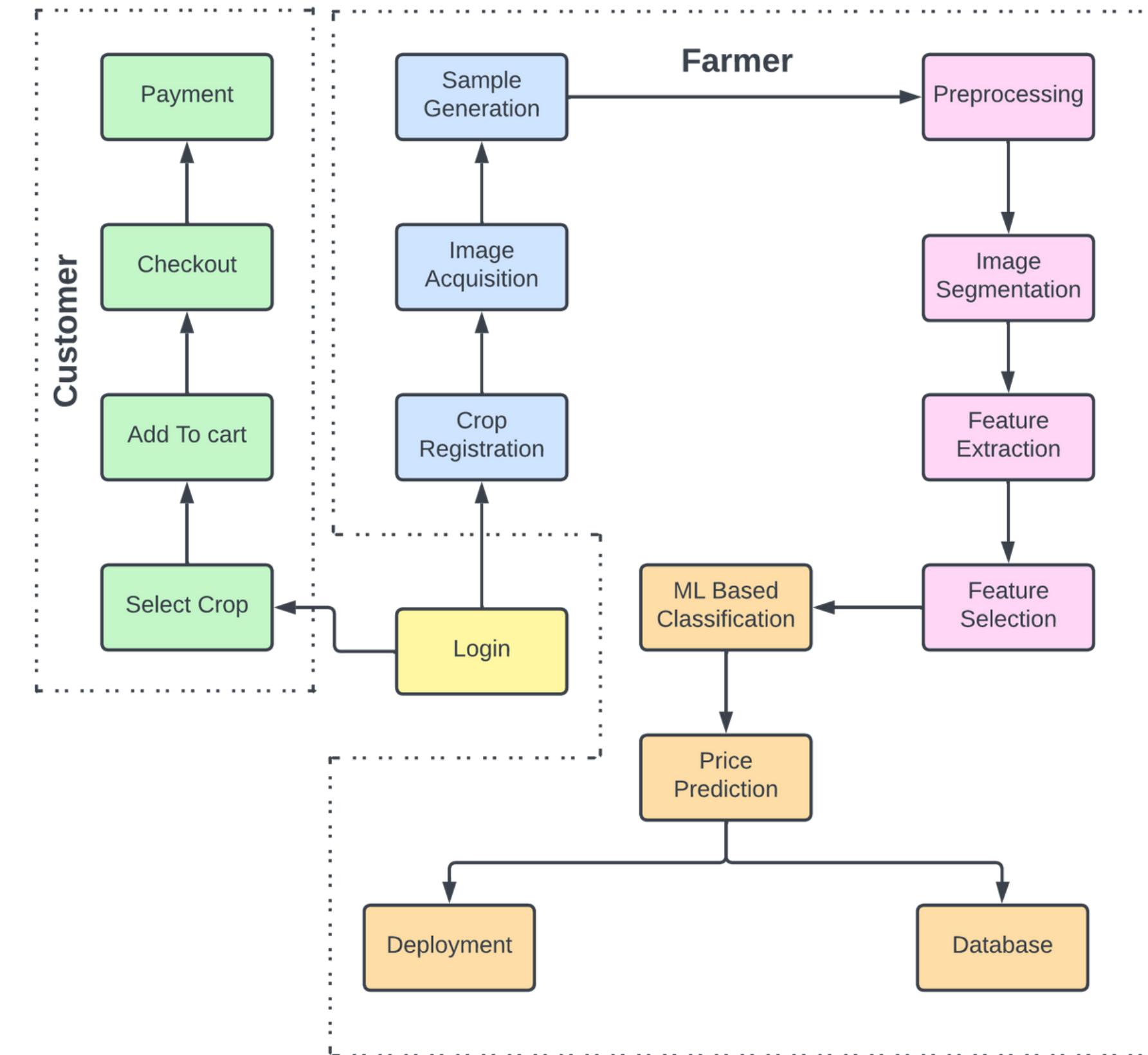


Constraints

- **Sample Size:** The constraint that the farmer will upload only some amount of images of the actual sample that he has produced and will use his own image capturing device for taking the images
- **Quality of Images:** The performance of the model may be affected by variation in the seed images due to orientation, position and lighting conditions.
- **Limited Datasets:** The constraint that the dataset size available for prediction is limited, which can affect the accuracy of the predictions.



Project Execution Plan





PART 1

- The Farmer Logins into the portal and registers the crop.
- The Farmer uploads the quality images of seeds on the site.
- The site processes the images.
- The site does Image Segmentation to identify the regions of interest in the crop images.
- Then the site does Feature Extraction to extract important features of segmented image.
- Feature Selection is done and specific features are selected
- Classification result is displayed for whether the seed quality is good or not.
- A full Quality Estimation based on classification result is done.
- Price Prediction based on the crop quality is done.
- The final Price is then displayed on the screen to the farmer.



PART 2

- The customer picks a desirable crop according to the quality, price and availability.
- Then proceeds to choose the quantity required for the purchase.
- He then proceeds to add the item to cart
- A purchase is then made by confirming the payment.
- An optional Review / Rating can be given.



Project Requirements (Tools & Platforms)

Python :

- OpenCV
- Scikit-learn
- Pandas
- NumPy
- Flask

Web-Development:

- HTML/CSS/JavaScript
- MERN Stack
- SQL
- Apache
- Git / Github

Payment Gateway:

- BillDesk
- Razorpay

IDE:

- VS Code
- Visual Studio
- Jupyter Notebook
- Anaconda / Pycharm
- Google Collab

Design Tools:

- Figma
- Star UML
- Canva
- Microsoft Word / Powerpoint
- Project Libre



Project Outcomes

A reliable platform with following outcomes:

- **Market Diversification** - The current farming supply market would be supplemented with an online market place with genuine prices.
- **Quality Prediction** - The crop qualities would be predicted using machine learning algorithms that can accurately define the standard of the crops.
- **Price Prediction** - The price of the crop would be anticipated upon the quality of the crop predicted by the previous algorithms and current market prices.
- **Customer Convenience** - Customer who cannot visit local market for purchase would now have a reliable market place to purchase the crops in a hassle free manner.



Work Plan

	①	Name	Duration	Start	Finish
1		▣ FarmFusion	129 days?	2/1/23 8:00 AM	7/31/23 5:00 PM
2		▣ Planning	6 days?	2/1/23 8:00 AM	2/8/23 5:00 PM
3		Requirement Gathering	1 day?	2/1/23 8:00 AM	2/1/23 5:00 PM
4	▣	Schedule Feasibility	1 day?	2/2/23 8:00 AM	2/2/23 5:00 PM
5	▣	Technical Feasibility	1 day?	2/3/23 8:00 AM	2/3/23 5:00 PM
6	▣	Economic Feasibility	1 day?	2/4/23 8:00 AM	2/6/23 5:00 PM
7	▣	Operational Feasibility	1 day?	2/6/23 8:00 AM	2/6/23 5:00 PM
8	▣	Legal Feasibility	1 day?	2/7/23 8:00 AM	2/7/23 5:00 PM
9	▣	Cultural Feasibility	1 day?	2/8/23 8:00 AM	2/8/23 5:00 PM
10	▣	▣ Requirement Analysis	12 days?	2/9/23 8:00 AM	2/24/23 5:00 PM
11	▣	Functional Requirements	4 days?	2/9/23 8:00 AM	2/14/23 5:00 PM
12	▣	Non-Functional Requirements	3 days?	2/15/23 8:00 AM	2/17/23 5:00 PM
13	▣	SRS Document	5 days?	2/20/23 8:00 AM	2/24/23 5:00 PM
14	▣	▣ Design	15 days?	2/27/23 8:00 AM	3/17/23 5:00 PM
15		DFD	3 days?	2/27/23 8:00 AM	3/1/23 5:00 PM
16	▣	UML Diagrams	6 days?	3/4/23 8:00 AM	3/13/23 5:00 PM
17	▣	ER Diagrams	4 days?	3/14/23 8:00 AM	3/17/23 5:00 PM
18	▣	▣ Implementation	64 days?	3/20/23 8:00 AM	6/15/23 5:00 PM
19		Research	10 days?	3/20/23 8:00 AM	3/31/23 5:00 PM
20	▣	Frontend	10 days?	4/1/23 8:00 AM	4/14/23 5:00 PM
21	▣	Collecting Data	6 days?	4/15/23 8:00 AM	4/24/23 5:00 PM
22	▣	Developing Algorithms	12 days?	4/25/23 8:00 AM	5/10/23 5:00 PM
23	▣	Database	5 days?	5/11/23 8:00 AM	5/17/23 5:00 PM
24	▣	Backend	21 days?	5/18/23 8:00 AM	6/15/23 5:00 PM
25	▣	Unit Testing	54 days?	4/1/23 8:00 AM	6/15/23 5:00 PM
26	▣	Integration Testing	54 days?	4/1/23 8:00 AM	6/15/23 5:00 PM
27		▣ Testing	16 days?	6/16/23 8:00 AM	7/7/23 5:00 PM
28		▣ System Testing	10 days?	6/16/23 8:00 AM	6/29/23 5:00 PM
29	▣	Performance Testing	5 days?	6/16/23 8:00 AM	6/22/23 5:00 PM
30	▣	Function Tsting	5 days?	6/23/23 8:00 AM	6/29/23 5:00 PM
31	▣	Security Testing	6 days?	6/30/23 8:00 AM	7/7/23 5:00 PM
32		▣ Deployment and Maintena...	15 days?	7/8/23 8:00 AM	7/28/23 5:00 PM
33	▣	Deployment	8 days?	7/8/23 8:00 AM	7/19/23 5:00 PM
34	▣	Maintenance	7 days?	7/20/23 8:00 AM	7/28/23 5:00 PM
35		Documentation	129 days?	2/1/23 8:00 AM	7/31/23 5:00 PM

