# “Bean Care” : Design and Implementation of Diseases Diagnosis System for Beans

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Project Proposal Report

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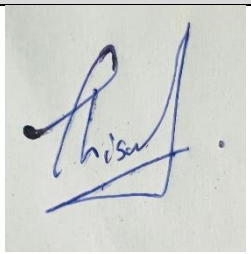
## Declaration of the candidate & Supervisor

To the best of our knowledge and belief, this proposal does not contain any previously published or written by another person material, except where the acknowledgement is made in the text. We declare that this is our own work, and this proposal does not incorporate without acknowledgment any material previously submitted for a degree or diploma in any other university or Institute of higher learning.

| Name | Student ID | Signature |
|---|---|---|
| **Bandara Higgoda T.T.S** | **IT20119362** |  |

The supervisor/s should certify the proposal report with the following declaration.

The above candidates are carrying out research for the undergraduate Dissertation under my supervision.

……. 2023/08/14

Signature of the supervisor: Date:

# Abstract

This project proposal outlines the development of a predictive model to determine the market value of beans based on historical price data. The proposed system aims to provide bean farmers with insights into market trends and potential profitability, enabling informed decision-making in their cultivation and sales strategies.

Keywords: Machine Learning, Image Recognition, E-Learning

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Existing literature highlights the significance of predictive analytics in agriculture. Similar models have been successfully developed for various crops, aiding farmers in optimizing their decision-making processes. However, there is a gap when it comes to specialized models for beans, which this project seeks to address.Research Gap & Research Problem ..... 5

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# 1. Introduction

In the agricultural sector, understanding market dynamics is crucial for farmers to optimize their yield and earnings. The proposed system focuses on predicting the market value of beans, a staple crop in many regions. By leveraging historical price data from the past five years, the system aims to offer farmers valuable insights into the fluctuating market trends.

## 1.1. Motivation

The motivation behind this project is to empower bean farmers with predictive analytics that can aid in making informed decisions about planting, harvesting, and selling their produce. By having access to accurate market value predictions, farmers can strategically plan their cultivation and sales activities, ultimately enhancing their profitability.

## 1.2 Importance of using a web application

A web application provides an accessible and user-friendly platform for farmers to interact with the predictive model. Farmers can easily input relevant data and receive instant predictions, eliminating the need for complex data analysis. This approach democratizes market insights, making them accessible to a wider range of farmers regardless of their technical expertise.

# 2. Background and Literature Survey

## 2.1 Background

The global bean market experiences fluctuating prices due to various factors such as weather conditions, supply and demand dynamics, and economic influences. By analyzing

historical price data and identifying patterns, the proposed system aims to provide a forward-looking perspective on market trends.

### 2.2 Literature Review

Existing literature highlights the significance of predictive analytics in agriculture. Similar models have been successfully developed for various crops, aiding farmers in optimizing their decision-making processes. However, there is a gap when it comes to specialized models for beans, which this project seeks to address.Research Gap & Research Problem

## 3. Research Gap & Research Problem

### 3.1 Research Gap

| Gap No | Features to be expand |
|---|---|
| **1** | Limited availability of bean-specific predictive models. |
| **2** | Insufficient utilization of historical bean price data. |
| **3** | Lack of user-friendly platforms for market value predictions. |
| **4** | Inadequate integration of data analytics into bean farming practices.. |

**Table 3.1.1 – Features to be Expand**

Existing market value prediction models for beans may not be tailored specifically to Sri Lanka's agricultural conditions and market trends. There is a gap in the research concerning the development of a localized predictive model that caters to the unique requirements of the Sri Lankan bean market Research Problem.

## 4. Objectives

### 4.1 Main Objective

The main objective is to develop a predictive model that accurately estimates the market value of beans based on historical price data.

### 4.2 Specific Objectives

1. Collect and preprocess historical bean price data from the past five years.

2. Develop a machine learning model tailored for predicting bean market values.

3. Design and implement a web application for farmers to interact with the model.

4. Validate and fine-tune the predictive model using real-world market data.

# 5 Methodology

## 5.1 Functional Requirements

### 5.1.1 Overall System Overview


Figure 5.1.1.1 **System Overview**

1. *User (A)*: Represents the end-user, usually a farmer, who interacts with the system.

2. *Web Application (B)*: This is the user interface through which users interact with the system. Users can upload images of their bean crops to predict the market value.

3. *Image Upload (C)*: Users upload images of their bean crops through the web application. These images are then sent to the Market Value Prediction Model for analysis.

4. *Market Value Prediction Model (D)*: The model uses machine learning techniques to analyze the uploaded images of bean crops and predict their market value based on historical data and market trends.

5. *Market Value Estimation (E)*: The Market Value Prediction Model predicts the market value of the uploaded bean crops based on factors like quality, size, and other attributes.

6. *Market Insights (F)*: Once the market value is estimated, the system provides insights into the current market trends and conditions. This helps farmers make informed decisions about when and where to sell their bean crops.

Users interact with the web application, upload images of bean crops, which are then analyzed by the Market Value Prediction Model. The model predicts the market value and provides valuable insights for farmers to make informed marketing decisions.

### 5.1.2 System Overview for Instruction / Treatments Releasing.


Figure 5.1.2.1 **System Overview for Instruction / Treatments**

## 5.2 Application of Key Pillars

The application of key pillars involves data preprocessing, model development, web application design, and real-time data integration.

### 5.3 Tools and Technologies

| Tools and Technologies | Explanation |
|---|---|
| Python | Programming language for model development and data analysis. |
| Flask | Web framework for building the user interface and handling data. |
| Pandas, NumPy | Libraries for data manipulation and analysis. |
| Scikit-learn | Machine learning library for model development. |
| HTML/CSS/JavaScript | Front-end technologies for the web application.. |

Table 5.3.1 **Tools and Technologies chart**

## 6 Evaluation Criteria

### 6.1 Gantt Chart


Figure 6.1.1 **Gantt chart**

### 6.2 Work Breakdown Structure

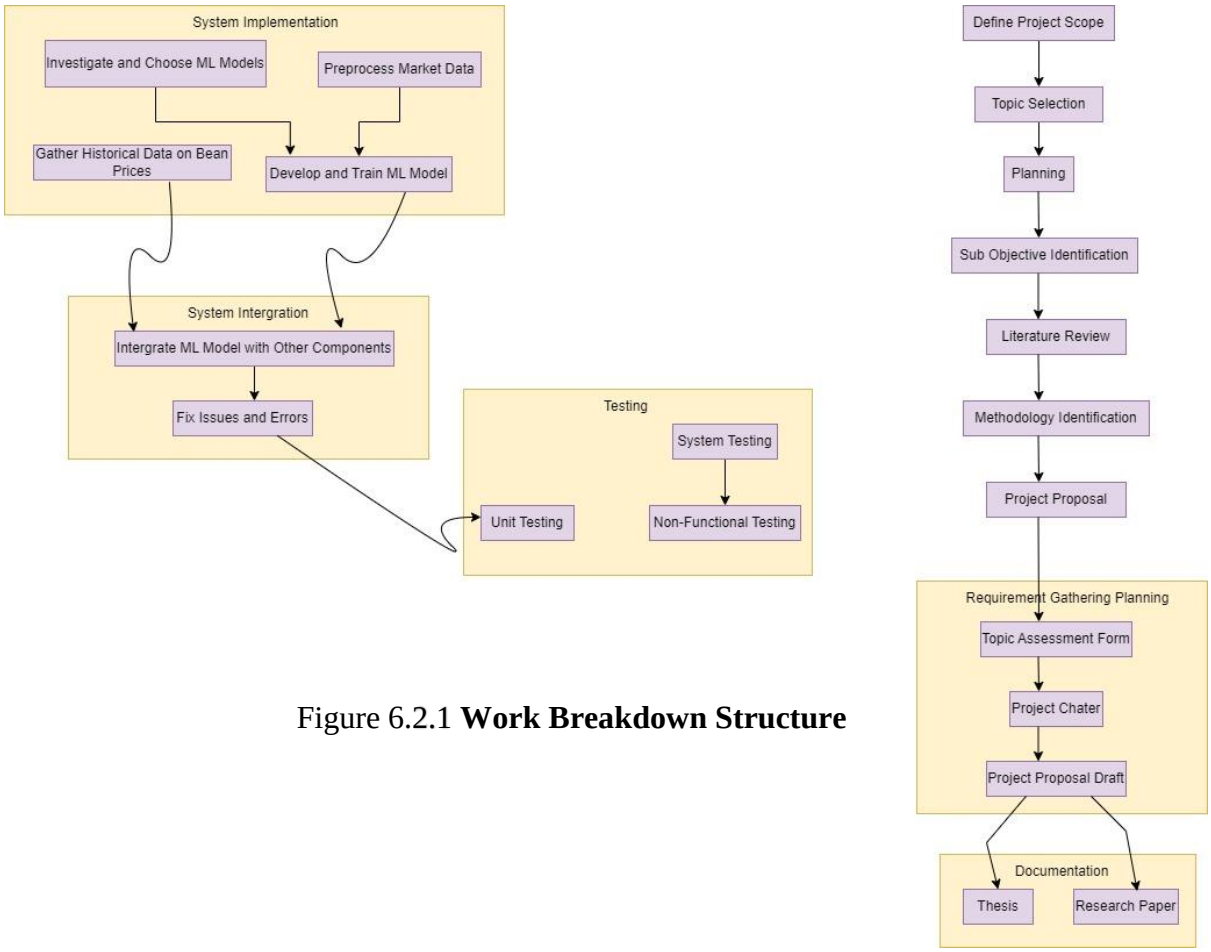


Figure 6.2.1 **Work Breakdown Structure**

## 7 Commercialization

The commercialization strategy involves offering subscription plans to farmers for access to the Market Value Prediction System. Subscription tiers will cater to different needs, providing varying levels of access to predictions and insights.

# 8 Description of Personal and Facilities

| IT Number | Member | Task |
|---|---|---|
| IT20119362 | Bandara Higgoda T.T.S. | Develop the bean market value prediction model. |

Table 8.1: Description of personal and facilities

## 8.1 User Requirements

- Accurate predictions of bean market values.
- Easy-to-use interface for input and results.
- Real-time insights into market trends.

## 8.2 Software Requirements

- Python environment for model development.
- Web development tools for the application.

## 8.3 Functional Requirement

- Accurate market value predictions.
- User-friendly web interface.
- Integration with real-time market data.

## 8.4 Non-Functional requirement

- System reliability and availability.
- Data security and privacy measures.

# 9 Budget and Budget Justification

Up until the proposed project is tested, this budget is estimated. Depending on the choices we make throughout the project, the budget may be altered. Throughout the entire project, costs will be borne by representatives of the project community.

| Activities | Amount (Rs.) |
|---|---|
| Development Resources | 4500.00 |
| Data Acquisition | 4000.00 |
| Infrastructure | 4000.00 |
| Marketing | 4500.00 |
| Maintenance | 3000.00 |
| Miscellaneous | 4000.00 |
| Total | 24000.00 |

Table 9.1: Estimate Budget

## References

1. *Sarma, K., & Khanna, V. (2018). Forecasting agricultural commodity prices using machine learning techniques. Expert Systems with Applications, 94, 61-73.*

This study explores the use of machine learning techniques for forecasting agricultural commodity prices, including beans, which aligns with the objective of predicting the market value of beans.

2. *Sivakumar, A. I., & Bhatti, T. A. (2021). Price prediction of agricultural commodities using machine learning algorithms: A review. Computers and Electronics in Agriculture, 180, 105948.*

This review article provides an overview of different machine learning algorithms used for predicting agricultural commodity prices, which can offer insights for predicting the market value of beans.

3. *Datta, S., & Bhattacharya, A. (2020). Predicting agricultural commodity price and weather trend using machine learning: A review. Computers and Electronics in Agriculture, 171, 105325.*

This review article discusses the prediction of agricultural commodity prices and weather trends using machine learning, which is directly relevant to the task of predicting the market value of beans.

4. *Zhao, Y., Cheng, B., & Zhao, J. (2019). Forecasting agricultural product price using ARIMA and LSTM. In Proceedings of the 1st International Conference on Data Intelligence and Security (pp. 329-334). ACM.*

This paper presents the use of ARIMA and LSTM models for forecasting agricultural product prices, which can provide valuable insights into forecasting methods for predicting the market value of beans.

5. *Huang, T. K., & Tzeng, G. H. (2020). A novel hybrid model of SVM and extreme learning machine for forecasting market prices of agricultural products. Applied Sciences, 10(13), 4426.*

This study introduces a hybrid model of SVM and extreme learning machine for forecasting market prices of agricultural products, which can offer an innovative approach for predicting the market value of beans.