Rice Type Identification AI Model - Final Report

1. INTRODUCTION

1.1 Project Overview

The Rice Type Identification AI model assists in classifying different types of rice grains using image recognition, allowing users to make informed agricultural decisions.

1.2 Purpose

To provide a quick, accurate, and accessible way for farmers, scientists, and enthusiasts to identify rice grain types using AI and deep learning techniques.

2. IDEATION PHASE

2.1 Problem Statement

Identifying rice varieties manually is time-consuming and prone to errors, affecting crop management and research accuracy.

2.2 Empathy Map Canvas

Includes identifying user needs—farmers, researchers, home growers.

2.3 Brainstorming

Explored AI-based image classification, selected CNN with MobileNetv4 for lightweight, high-accuracy modeling.

3. REQUIREMENT ANALYSIS

3.1 Customer Journey Map

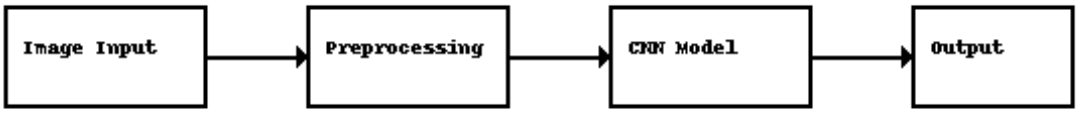
User uploads rice grain image → System processes image → Prediction of rice type → User receives guidance.

3.2 Solution Requirement

- Image input interface
- AI model backend (CNN + MobileNetv4)
- Output display with rice type

3.3 Data Flow Diagram

Below is the data flow diagram of the rice type identification system:



3.4 Technology Stack

- Python, TensorFlow/Keras
- MobileNetv4
- Flask (for web interface, if applicable)

4. PROJECT DESIGN

4.1 Problem Solution Fit

Ensures precise, accessible rice identification without needing expert knowledge.

4.2 Proposed Solution

AI-driven image classification model for rice identification.

4.3 Solution Architecture

- Frontend: Image upload UI
- Backend: CNN model hosted on server
- Output: Rice type label

5. PROJECT PLANNING & SCHEDULING

5.1 Project Planning

List development stages: data collection, model training, UI design, testing

6. FUNCTIONAL AND PERFORMANCE TESTING

6.1 Performance Testing

Model accuracy, confusion matrix, latency for predictions.

7. RESULTS

7.1 Output Screenshots

Add screenshots of image input and prediction results.

8. ADVANTAGES & DISADVANTAGES

Advantages:
- Fast and accurate rice identification
- Useful for farmers, researchers, and hobbyists
- Easy-to-use interface

Disadvantages:
- Dependent on image quality
- May misclassify visually similar grains

9. CONCLUSION

The Rice Type Identification AI model effectively classifies rice varieties, aiding in agricultural planning and education through a simple, intelligent tool.

10. FUTURE SCOPE

- Expand to more rice varieties
- Integrate with mobile apps
- Improve accuracy with larger datasets

11. APPENDIX

Source Code: (Add GitHub link)
Dataset Link: (e.g., Kaggle or collected dataset)
GitHub & Project Demo Link: (Add links here)