**Project Design Phase**

**Proposed Solution Template**

|  |  |
| --- | --- |
| Date |  |
| Team ID |  |
| Project Name |  |
| Maximum Marks |  |

**Proposed Solution Template:**

Project team shall fill the following information in the proposed solution template

|  |  |  |
| --- | --- | --- |
| **S.No.** | **Parameter** | **Description** |
| 1. | Problem Statement (Problem to be solved) |  |
| 2. | Idea / Solution description |  |
| 3. | Novelty / Uniqueness |  |
| 4. | Social Impact / Customer Satisfaction |  |
| 5. | Business Model (Revenue Model) |  |
| 6. | Scalability of the Solution |  |

**2.3.Brainstorming**

* Brainstorming Notes
* Project Challenge Identified
* Manual sorting is slow, labor-intensive, and prone to errors.
* Rotten fruits/vegetables can visually resemble fresh ones, making detection difficult for the human eye during fast sorting.
* Need to process large volumes of produce in minimal time without compromising on quality.
* **Transfer learning with AI**
* Pros: Leverages pre-trained deep learning models to detect complex patterns in images
* Pros: Adapts easily to new produce types with minimal retraining
* Cons: Needs dataset preparation and tuning
* **Hybrid human + AI system**
* Pros: Combines human judgment with AI speed
* Cons: Still requires human intervention, reducing automation benefits
* **Tools Considered**
* TensorFlow + Keras for model building
* OpenCV for image capture and preprocessing
* Raspberry Pi or Arduino with camera module (if hardware integration needed)
* Google Colab / Jupyter Notebook for prototyping
* **Key Features Brainstormed**
* Automatic detection of fresh vs. rotten produce
* Real-time classification (processing images on-the-fly)
* Dashboard for monitoring accuracy and batch statistics
* Option for operator to override machine decisions if necessary
* **Risk Areas Identified**
* Difficulty in creating a balanced dataset (fresh vs. rotten)
* Potential misclassification due to lighting or camera qualityIntegration challenges between AI model and physical sorting hardware
* **Enhancement Ideas**
* Add grading for ripeness level (e.g., underripe, ripe, overripe)
* Predict shelf life using AI vision
* Build a mobile app interface for supervisors to monitor remotely
* Add IoT sensors for temperature, humidity to complement vision system
* **Success Metrics Defined**
* Classification accuracy (target: >90%)
* Sorting speed matching or exceeding manual process
* Reduction in human error rates
* Reduced food wastage during sorting
* **Visual Roadmap (Brainstorming Outcome)**

