**Project Design Phase**

**Solution Architecture**

🧠**Goal**

Bridge real-world spoilage detection challenges with a lightweight, accessible AI solution using transfer learning.

⚙️**Core Components**

* **Model**: MobileNetV2 + Transfer Learning for classifying fruits/vegetables as *Fresh* or *Rotten* with confidence scores.
* **Frontend**: Simple mobile/web UI for image capture or upload.
* **Backend**: Flask-based API for inference; real-time result delivery.
* **Deployment**: Optimized for low-resource devices, with offline support.

🔄**System Flow**

1. User captures or uploads image.
2. Image is preprocessed and fed to the trained model.
3. Model predicts class + confidence.
4. Result is displayed instantly to the user.

🧩**Development Phases**

* Data collection & preprocessing
* Model training & optimization
* UI design for accessibility
* Testing, deployment, and user onboarding

✅**Technical & Business Requirements**

* Mobile-first and rural-friendly
* Scalable for farms, vendors, and markets
* Minimal setup, intuitive UX
* Supports inconsistent internet access

**Example - Solution Architecture Diagram:**

