**Phase-3:Project Design**

**Technical Architecture:**

A picture containing text, diagram, screenshot, font

Description automatically generated

**System Architecture Diagram**

**User(Farmer)**

**Web Frontend(Flask)**

**-Upload Image UI**

**-Display Results**

**Storage(Local)**

**-Rice grain images**

**-Model files(.h5)**

**-Prediction logs(opt.)**

**Deep Learning Model**

**(CNN + MobileNetV4 TL)**

**-Loads pretrained model**

**-Predicts rice type**

**Web Backend(Flask)**

**-Receives image**

**-Preprocesses image**

**-Calls ML model**

**-Returns prediction**

**User Flow:**

[User]

|

|--> Accesses GrainPalette Web App

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|--> Uploads Rice Grain Image

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|--> Image sent to Backend via Flask

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|--> Preprocessing (resize, normalize)

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|--> Pass image to AI Model

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|--> Model predicts Rice Type

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|--> Return prediction result to Backend

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|--> Display result to User

|

|--> Option to upload another image or exit

**UI/UX Considerations:**

Make the web app simple, intuitive, and accessible for farmers, researchers, and students — even those with minimal tech skills.

### ****Web App Pages & UI Elements****

#### ****1. Home Page****

* Title: **GrainPalette - Rice Type Identifier**
* Brief description of the app’s purpose.
* **Upload Image Button**
* Image Preview
* **Predict Button**

#### ****2. Prediction Result Page****

* Clear display of predicted rice type (large, bold text)
* Confidence score (optional)
* Display uploaded image preview beside result.
* **Upload New Image** or **Exit** button

### ****UI Components****

* **Responsive design** (mobile/tablet-friendly)
* Minimal color palette (preferably earthy tones — green, brown, white)
* Large, accessible buttons and labels
* Clear feedback messages:
  + “Image uploaded successfully.”
  + “Prediction completed.”
  + “Please upload a valid image.”
* Loading spinner/animation during prediction process
* Error handling messages for invalid uploads

### ****Accessibility****

* Use **alt text for images**
* **Keyboard navigation support**
* Readable font sizes (16px+ for body, 20px+ for headers)
* Avoid jargon, use farmer-friendly language