**Ideation Phase**

**Empathize & Discover**

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| **Date** | June 30, 2025 |
| **Team ID** | LTVIP2025TMID39636 |
| **Project Name** | GrainPalette - A Deep Learning Odyssey In Rice Type Classification Through Transfer Learning |
| **Maximum Marks** | 4 Marks |

**Empathy Map Canvas:**

An empathy map is a simple, easy-to-digest visual that captures knowledge about a user’s

behaviours and attitudes.

It is a useful tool to helps teams better understand their users.

Creating an effective solution requires understanding the true problem and the person who

is experiencing it. The exercise of creating the map helps participants consider things from

the user’s perspective along with his or her goals and challenges.

**Reference:** <https://www.mural.co/templates/empathy-map-canvas>

**GrainPalette: A Deep Learning Odyssey in Rice Type Classification Through Transfer Learning**

Rice is a staple food for more than half of the world’s population, and accurate identification of rice varieties is critical for ensuring quality, authenticity, fair pricing, and food safety. However, manual classification of rice grains based on shape, size, and texture is time-consuming, error-prone, and requires expert knowledge. Misclassification can lead to economic losses for farmers and traders, and to consumers not receiving the rice variety they expect.

To address these challenges, modern AI techniques—particularly deep learning with transfer learning—offer powerful solutions for automatic rice type classification based on grain images. By training machine learning models on large datasets of rice images, it becomes possible to classify different rice varieties with high precision and consistency.

Transfer learning allows leveraging pre-trained convolutional neural networks (CNNs) such as ResNet, VGG, or EfficientNet, which have already learned to extract rich visual features from large image datasets. Fine-tuning these models on rice grain images enables the system to learn subtle differences in grain characteristics like length, width, curvature, and surface texture, which are crucial for accurate classification.