

**Project Design Phase**  
**Problem – Solution Fit Template**

Date	28 June 2025
Team ID	LTVIP2025TMID40189
Project Name	GrainPalette - A Deep Learning Odyssey In Rice Type Classification Through Transfer Learning
Maximum Marks	2 Marks

**Problem – Solution Fit Template:**

Farmers, agriculture researchers, and home gardeners often struggle to **accurately identify rice grain types**, especially when dealing with local seed varieties, new hybrid strains, or visually similar grains. This leads to:

- **Ineffective cultivation strategies** (incorrect watering, fertilization, or pest control).
- **Inconsistent yields and crop performance** due to unknown rice variety characteristics.
- **Manual and time-consuming identification** methods that require expert knowledge.
- **Limited access to expert analysis**, particularly in rural or remote areas.

**The Solution: GrainPalette AI Model**

**GrainPalette** offers an AI-driven solution using **Convolutional Neural Networks (CNN)** with **MobileNetV4-based transfer learning** to identify rice grain types from uploaded images with high accuracy and speed.

With just a photo of a rice grain, the system:

- Predicts the rice variety instantly.
- Recommends relevant cultivation practices.
- Empowers users with real-time insights — no expert required.

**Purpose:**

**Objective**

**Fit with GrainPalette**

✓ Solve complex problems based on customer context	Farmers and agri-scientists need reliable, on-the-spot grain type identification to make informed decisions. GrainPalette meets this need without requiring technical expertise.
✓ Accelerate solution adoption	Mobile/web platform with fast predictions taps into farmers' increasing access to smartphones and growing comfort with tech-based solutions.
✓ Sharpen communication strategy	Messaging like “Know your seed before you sow” or “AI-powered rice classification” appeals directly to pain points like guesswork in seed use.
✓ Increase engagement with touchpoints	Each upload = an interaction. This builds trust and usage habits, while helping collect real-time agri data.
✓ Understand and improve user environment	By identifying commonly misclassified or misunderstood rice types, the system improves agricultural planning and extension services.

## Template:

Define CS, fit into CC	<b>1. CUSTOMER SEGMENT(S)</b> Who is your customer? I.e. working parents of 0-5 y.o. kids	<b>CS</b>	<b>6. CUSTOMER CONSTRAINTS</b> What constraints prevent your customers from taking action or limit their choices of solutions? I.e. spending power, budget, no cash, network connection, available devices.	<b>CC</b>	<b>5. AVAILABLE SOLUTIONS</b> Which solutions are available to the customers when they face the problem or need to get the job done? What have they tried in the past? What pros & cons do these solutions have? I.e. pen and paper is an alternative to digital notetaking	<b>AS</b>	Explore AS, differentiate
Focus on J&P, tap into BE, understand RC	<b>2. JOBS-TO-BE-DONE / PROBLEMS</b> Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one, explore different sides.	<b>J&amp;P</b>	<b>9. PROBLEM ROOT CAUSE</b> What is the real reason that this problem exists? What is the back story behind the need to do this job? I.e. customers have to do it because of the change in regulations.	<b>RC</b>	<b>7. BEHAVIOUR</b> What does your customer do to address the problem and get the job done? I.e. directly related: find the right solar panel installer, calculate usage and benefits; Indirectly associated: customers spend free time on volunteering work (I.e. Greenpeace)	<b>BE</b>	Focus on J&P, tap into BE, understand RC
Identify strong TR & EM	<b>3. TRIGGERS</b> What triggers customers to act? I.e. seeing their neighbour installing solar panels, reading about a more efficient solution in the news.	<b>TR</b>	<b>10. YOUR SOLUTION</b> If you are working on an existing business, write down your current solution first, fill in the canvas, and check how much it fits reality. If you are working on a new business proposition, then keep it blank until you fill in the canvas and come up with a solution that fits within customer limitations, solves a problem and matches customer behaviour.	<b>SL</b>	<b>8. CHANNELS of BEHAVIOUR</b> <b>8.1 ONLINE</b> What kind of actions do customers take online? Extract online channels from #7	<b>CH</b>	Extract online & offline CH of BE
	<b>4. EMOTIONS: BEFORE / AFTER</b> How do customers feel when they face a problem or a job and afterwards? I.e. lost, insecure + confident, in control - use it in your communication strategy & design.	<b>EM</b>			<b>8.2 OFFLINE</b> What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development.		

## References:

1. <https://www.ideahackers.network/problem-solution-fit-canvas/>
2. <https://medium.com/@epicantus/problem-solution-fit-canvas-aa3dd59cb4fe>