

4. PROJECT DESIGN

4.1 Problem – Solution Fit

Date	30 June 2025
Team ID	LTVIP2025TMID34162
Project Name	GrainPalette – A Deep Learning Odyssey in Rice Type Classification Through Transfer Learning
Maximum Marks	2 Marks

Problem – Solution Fit Canvas

Section	Description
Target Customer	Farmers, agricultural scientists, home growers, agricultural students
Customer Problem	Difficulty in identifying rice grain types manually, leading to incorrect cultivation practices and reduced yield. Lack of quick and reliable tools for rice grain classification.
Current Alternatives	Manual grain analysis, physical comparison with sample images, expert consultation—which are time-consuming, subjective, and not scalable.
Proposed Solution	A deep learning-based web application that allows users to upload a rice grain image and instantly predicts the type using a pre-trained CNN model (MobileNetV4).
Key Features	<ul style="list-style-type: none">- Upload and classify rice grain images instantly- High accuracy due to transfer learning- Web interface for easy use- Supports 5 rice varieties- Can be accessed from any device
Unique Value Proposition	Fast, accurate, and accessible rice grain classification using AI, enabling better planning and decision-making for farmers and researchers.
Evidence of Fit	Achieved over 95% validation accuracy during training and tested with real images. Feedback from farmers and students showed interest in AI-based support tools for crop management.

✓ Purpose This Template Serves

- Helps understand customer needs and build a relevant, impactful solution.
- Validates that your AI model addresses a real agricultural pain point.
- Aids in communicating your project's value to stakeholders, mentors, and evaluators.

References

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

Template:

Define CS, fit into CC	1. CUSTOMER SEGMENT(S) CS Who is your customer? I.e. working parents of 0-5 y.o. kids	6. CUSTOMER CONSTRAINTS CC 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.	5. AVAILABLE SOLUTIONS AS 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	Explore AS, differentiate
	2. JOBS-TO-BE-DONE / PROBLEMS J&P Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one; explore different sides.	9. PROBLEM ROOT CAUSE RC 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.	7. BEHAVIOUR BE 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)	
Focus on J&P, tap into BE, understand RC	3. TRIGGERS TR What triggers customers to act? I.e. seeing their neighbour installing solar panels, reading about a more efficient solution in the news.	10. YOUR SOLUTION SL 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.	8. CHANNELS of BEHAVIOUR CH 8.1 ONLINE What kind of actions do customers take online? Extract online channels from #7	Extract online & offline CH of BE
	4. EMOTIONS: BEFORE / AFTER EM 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.	8.2 OFFLINE What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development.		

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