

Project Design Phase

Problem – Solution Fit Template

Date	28 June 2025
Team ID	LTVIP2025TMID41474
Project Name	<i>Smart Sorting: Transfer Learning for Identifying Rotten Fruits and Vegetables</i>
Maximum Marks	2 Marks

Problem – Solution Fit Template:

The Problem–Solution Fit means ensuring that the proposed image-based classification system for fruits and vegetables truly addresses the real needs of consumers, vendors, and small-scale retailers by offering a simple, accessible, and efficient solution to detect spoilage.

Purpose:

Solve a common real-world issue by automating the identification of rotten fruits and vegetables using machine learning and image analysis, removing the need for expensive equipment or expert inspection.

Accelerate user adoption by delivering a **web-based platform** where users can simply upload a fruit or vegetable image to receive instant feedback — no technical knowledge required.

Sharpen communication and decision-making by using **visual and confidence-based output** that helps users understand the result and act on it (e.g., consume soon, discard).

Understand the current gap in accessible quality assessment tools, and provide a **technological solution** that is low-cost, portable (via browser), and scalable to broader food quality use cases.

Template:

Problem-Solution Fit canvas

Purpose / Vision

Version:

<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-weight: bold; font-size: 0.8em;">Define CS, fit into CL</div> <div> 1. CUSTOMER SEGMENT(S) CS <p>Individual consumers managing household food usage Grocery shopkeepers and fruit/vegetable vendors Farmers or suppliers sorting produce for sale Students and developers interested in AI-based agriculture tools</p> </div> <div style="writing-mode: vertical-rl; font-weight: bold; font-size: 0.8em;">Explore AS, differentiate</div> </div>	<div style="display: flex; justify-content: space-between; align-items: center;"> <div> 6. CUSTOMER LIMITATIONS <small>EG. BUDGET, DEVICES</small> CL <p>Limited access to automated sorting systems No budget for installing real-time camera hardware Lack of technical expertise for complex AI solutions Manual sorting leads to errors and time loss</p> </div> </div>	<div style="display: flex; justify-content: space-between; align-items: center;"> <div> 5. AVAILABLE SOLUTIONS <small>PROS & CONS</small> AS <p>Manual checking by visual inspection (inaccurate, time-consuming) High-end hardware-based sorting machines (expensive) Smart fridges with embedded cameras (not affordable for all) No freely accessible web tool for common users to classify spoilage</p> </div> <div style="writing-mode: vertical-rl; font-weight: bold; font-size: 0.8em;">Focus on PR, tap into BE, understand RC</div> </div>
<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-weight: bold; font-size: 0.8em;">Focus on PR, tap into BE, understand RC</div> <div> 2. PROBLEMS / PAINS + ITS FREQUENCY PR <p>Detect whether a fruit or vegetable is rotten before consumption/sale Avoid food waste by identifying spoilage early Provide a quick, easy, and non-technical tool for produce quality check Empower local vendors and consumers with AI assistance</p> </div> </div>	<div style="display: flex; justify-content: space-between; align-items: center;"> <div> 9. PROBLEM ROOT / CAUSE RC <p>Spoilage detection is mostly manual, subjective, and error-prone Lack of low-cost AI tools that don't require real-time cameras Transfer learning not yet widely applied in this domain for everyday users Small vendors and households don't have access to ML-based decision tools</p> </div> </div>	<div style="display: flex; justify-content: space-between; align-items: center;"> <div> 7. BEHAVIOR + ITS INTENSITY BE <p>People often smell, press, or guess ripeness manually Vendors rely on experience but can miss early spoilage signs There is hesitation in using new tech due to usability concerns Few digital tools are trusted or widely known in this area</p> </div> <div style="writing-mode: vertical-rl; font-weight: bold; font-size: 0.8em;">Extract online & offline CH of BE</div> </div>
<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-weight: bold; font-size: 0.8em;">Identify strong TR & EM</div> <div> 3. TRIGGERS TO ACT TR <p>Spoiled produce noticed too late Wastage of food items in household or shop storage Rising awareness of AI applications in daily life Project-based learning opportunities for students or innovators</p> </div> </div>	<div style="display: flex; justify-content: space-between; align-items: center;"> <div> 10. YOUR SOLUTION SL <p>A web application that uses transfer learning to predict the health status (rotten or fresh) of a fruit or vegetable from a simple uploaded image No special camera needed — works with images taken from phones Lightweight, user-friendly interface ideal for non-tech users Based on fine-tuned deep learning model adapted to food spoilage detection</p> </div> </div>	<div style="display: flex; justify-content: space-between; align-items: center;"> <div> 8. CHANNELS of BEHAVIOR CH <p>ONLINE Shared through AI/ML-focused online platforms (GitHub, HuggingFace) Promoted on agricultural awareness forums, YouTube demos</p> <p>OFFLINE Partnered with agri-tech learning events or competitions Word-of-mouth among local shopkeepers and student developers</p> </div> </div>
<div style="display: flex; justify-content: space-between; align-items: center;"> <div> 4. EMOTIONS <small>BEFORE / AFTER</small> EM <p>Frustrated by food going to waste Uncertainty when sorting items manually Confident in decisions based on AI predictions Satisfaction from saving money and reducing waste Interest in using AI for everyday problem-solving</p> </div> </div>		

Problem-Solution fit canvas is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License.
 Designed by Daria Nepriakhina / ideahackers.nl - we tailor ideas to customer behaviour and increase solution adoption probability.

IdeaHackers .NL

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