

## Project Design Phase-I Problem Solution Fit Template

Date	01 October 2022
Team ID	PNT2022TMID13105
Project Name	Fertilizers recommendation system for disease prediction

Problem-Solution Fit		Purpose / Vision: To identify and recommend appropriate fertilizer for the plants with diseases by predicting them.		Version: 1	
Define CS, fit into CL	<b>1. CUSTOMER SEGMENT(S)</b> <span>CS</span> <ul style="list-style-type: none"> <li>Geographic</li> <li>Demographic</li> <li>Psychographic</li> <li>Behavioral</li> </ul>	<b>6. CUSTOMER LIMITATIONS</b> <span>CL</span> <small>EG. BUDGET, DEVICES</small> <ul style="list-style-type: none"> <li>Supply and demand factors</li> <li>Expensive</li> <li>Provide only short-term benefits</li> </ul>	<b>5. AVAILABLE SOLUTIONS</b> <span>AS</span> <small>PLUSES &amp; MINUSES</small> <p>Used K-Medoid clustering and Random Forest classification methods. The image of the leaf is pre-processed in this research, and then the clustering approach is used to locate the impacted area of the leaf. The system detects sickness in the leaf using K-Medoid clustering and the Random Forest algorithm.</p>		
	<b>2. PROBLEMS / PAINS + ITS FREQUENCY</b> <span>PR</span> <ul style="list-style-type: none"> <li>Crop choice depending upon the soil in their farmlands</li> <li>Choosing the right fertilizers for their crops, which plays a very important role in getting a good and profitable yield.</li> <li>Pest control or the diseases to which the plants may limit their growth.</li> </ul>	<b>9. PROBLEM ROOT / CAUSE</b> <span>RC</span> <p>The three factors that have to coexist are presence of a pathogen, proper greenhouse environment for disease development and a susceptible host plant. Infectious plant diseases are caused by living (biotic) agents, or pathogens. These pathogens can be spread from an infected plant or plant debris to a healthy plant.</p>	<b>7. BEHAVIOR + ITS INTENSITY</b> <span>BE</span> <ul style="list-style-type: none"> <li>The detection of a disease at early points in time</li> <li>The differentiation among different diseases</li> <li>The separation of diseases caused by abiotic stresses</li> <li>The quantification of disease severity.</li> </ul>		
Focus on PR, tap into BE, understand RC	<b>3. TRIGGERS TO ACT</b> <span>TR</span> <ul style="list-style-type: none"> <li>The particular mixture of nutrients needed; equipment needed</li> <li>The crop, timing of application</li> </ul>	<b>10. YOUR SOLUTION</b> <span>SL</span> <p>Can use SVM to classify tree leaves, identify the disease and suggest the fertilizer. This can be compared with the existing CNN based leaf disease prediction. Then the proposed SVM technique gives a better result when compared to existing CNN.</p>	<b>8. CHANNELS of BEHAVIOR</b> <span>CH</span> <p>The system is capable of generating location-specific fertilizer recommendations for selected crops by analyzing the national soil database developed by this governmental institute.</p>		
	<b>4. EMOTIONS</b> <span>EM</span> <small>BEFORE / AFTER</small> <ul style="list-style-type: none"> <li>Before – Difficult</li> <li>After – Thoughtful and easy to implement</li> </ul>		<b>OFFLINE</b> <p>Fertilizers replace the nutrients that crops remove from the soil. Without the addition of fertilizers, crop yields and agricultural productivity would be significantly reduced.</p>		
Identify strong TR & EM			Extract online & offline CH of BE		