**Project Design Phase-I**
**Proposed Solution Template**

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| Date | 14 October 2022 |
| Team ID | PNT2022TMID28594 |
| Project Name | Project – Fertilizer Recommendation system for Disease Prediction |
| Maximum Marks | 2 Marks |

**Proposed Solution Template:**

| S.No. | Parameter | Description |
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| 1. | Problem Statement (Problem to be solved) | Mostly, the plant leaf diseases are caused by Pathogens which are positioned on the stems of the plants. These different symptoms and diseases of leaves are predicted by different methods in image processing. These different methods include different fundamental processes like segmentation, feature extraction and classification and so on. Mostly, the prediction and diagnosis of leaf diseases are depending on the segmentation such as segmenting the healthy tissues from diseased tissues of leaves. Detection and recognition of plant diseases using machine learning are very efficient in providing symptoms of identifying diseases at its earliest. |
| 2. | Idea / Solution description | Leaves are affected by bacteria, fungi, virus, and other insects. Support Vector Machine (SVM) algorithm classifies the leaf image as normal or affected. Vectors are constructed based on leaf features such as colour, shape, textures. Then hyperplane constructed with conditions to categorize the pre-processed leaves and also implement multiclass classifier, to predict diseases in leaf image with improved accuracy. |
| 3. | Novelty / Uniqueness | Recommends the fertilizer for affected leaves based on severity level. Fertilizers may be organic or inorganic. Admin can store the fertilizers based on disease categorization with severity levels. The measurements of fertilizers are also suggested based on disease severity. |
| 4. | Social Impact / Customer Satisfaction | Presently our farmers are not effectively using technology and analysis, so there may be a chance of wrong selection of fertilizer for crops that will reduce their income. To reduce those type of loses we have developed a farmer friendly system with GUI, that will predict which would be the best suitable fertilizer for particular crop disease. So, this makes the farmers to take right decision in selecting the fertilizer for crop disease such that agricultural sector will be developed by innovative idea. |

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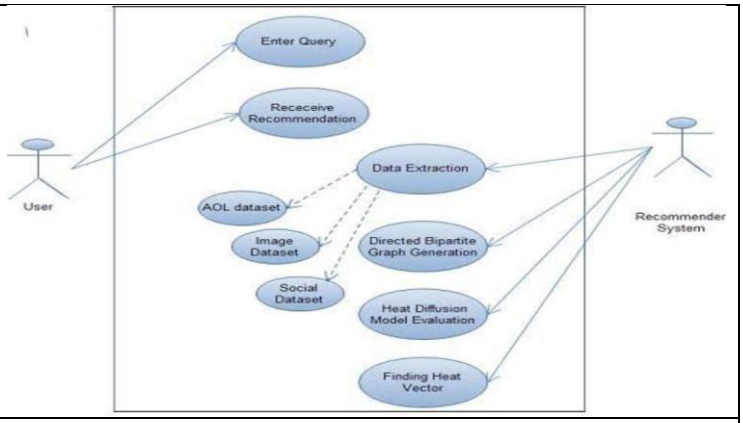
| 5. | Business Model (Revenue Model) |  |
| 6. | Scalability of the Solution | The proposed method uses SVM to classify tree leaves, identify the disease and suggest the fertilizer. The proposed method is compared with the existing CNN based leaf disease prediction. The proposed SVM technique gives a better result when compared to existing<br>CNN. For the same set of images, F-Measure for CNN is 0.7and 0.8 for SVM, the accuracy of identification of leaf disease of CNN is 0.6 and SVM is 0.8. |