Project Design Phase-I Proposed Solution

Date	23 October 2023
Team ID	Team-593089
Project Name	Deep Learning Model for Detecting Diseases in Tea Leaves
Maximum Marks	2 Marks

Proposed Solution Template:

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	The tea industry is facing a significant challenge in accurately and efficiently identifying and managing diseases that affect tea leaves. Current detection methods are often time-consuming and subjective, leading to delayed responses and increased crop losses. Therefore, there is an urgent need for a robust and automated solution to enable early disease detection, reduce the economic impact on tea plantations, and ensure the quality and sustainability of tea production. This problem statement seeks innovative technologies and methodologies to develop a reliable and cost-effective system for the timely identification and management of tea leaf diseases. Ultimately, this will enhance tea production and safeguard the industry's future.
2.	Idea / Solution description	We have developed a solution that improves tea leaf disease detection by using deep-learning models, which surpass the limits of manual observation and eliminate the need for time-consuming visits by experts to remote gardens. Our primary goal is to help tea farmers reduce their economic losses by analyzing images for color, spots, and texture on tea leaves. This includes enhancing tea production, increasing farmers' income, and tackling diseases such as tea algae leaf spot, tea bud blight, tea white scab, and tea leaf blight.

3.	Novelty / Uniqueness	We compare different deep-learning models, including CNN, RCNN, and VGG16, to determine the one with the highest accuracy. Additionally, we plan to develop an open-source website that enables farmers to upload images of tea leaves effortlessly. This website will detect diseases in the early stages which can allow farmers to take appropriate measures for minimizing crop loss.
4.	Social Impact / Customer Satisfaction	The open-source website is designed to be extremely user-friendly and convenient for tea farmers. They can easily upload multiple images of their crops to the website and receive accurate tea leaf disease detection. The website is flexible and customizable to meet the unique needs of each user. Additionally, it is free to use which helps reduce the cost of development and licensing during the initial stages.
5.	Business Model (Revenue Model)	Our product is essential for tea plantations, both large and small, globally as it helps protect their crops and increases efficiency. It is also beneficial for companies involved in processing and packaging tea products. We can charge tea plantations a small recurring subscription fee for access to the disease detection system, which includes maintenance, updates, and support. Additionally, we can provide training and consulting services to help plantations implement and optimize the system. To attract potential customers and generate more revenue, we need to advertise our product effectively. We also offer continuous technical support and training to assist customers in using the system efficiently and enhance their experience.
6.	Scalability of the Solution	At present, the model's accuracy is limited to identifying diseases in tea leaves only. However, having separate websites for different crops is not practical. Therefore, we can enhance the model's capabilities to identify crops from their leaves as well as detect diseases in them. Furthermore, we can incorporate additional features to our website to enhance user experience and tailor it to their specific requirements. And finally, to keep our website up-to-date, we can collaborate with agricultural experts and research institutions to enhance disease detection algorithms and methods.