Project Design
Phase-I
Proposed Solution Template

Date	24 September 2022
Team ID	PNT2022TMID28495
Project Name	Deep Learning Fundus Image Analysis for Early Detection of Diabetic Retinopathy
Maximum Marks	2 Marks

Proposed Solution Template:

The main aim of this project is to create an appropriate machine learning model to detect Diabetic Retinopathy as early as possible.

S No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Diabetic Retinopathy is one of the emerging diseases which is the reason for blindness. DR mutilates the retinal blood vessels of a patient having diabetes. Diabetic Retinopathy (DR) is an ophthalmic disease that damages retinal blood vessels. DR causes imperfect vision and may cause blindness if it is not diagnosed in early stages. Early detection of Diabetic Retinopathy includes the identification of microaneurysms and hemorrhages. Because the signs and symptoms of diabetic retinopathy are typically not present during the first stage of the disease, it can often go undiagnosed until damage to vision has occurred. Existing methods are lacking in the earlier detection. Because preprocessing techniques used in those methods are not effective to analyze such smaller features (nearly 10 microns to 100 microns).
2.	Idea / Solution description	We opt to use multi-layer neural networks as deep NN. Due to the fact that data is Image, the best type of neural network satisfying our goal is Convolutional Neural Networks. As we have to do for most of the data, normalization plays an important role in our process. Before doing any tasks, preprocessing images (our dataset) is highly recommended.

		Consequently better accuracy will be achieved by preprocessed data. After preprocessing and normalizing, the prepared dataset could be used as input to our deep convolutional neural network. Then deep NN will be run and fit to our data and the result will be produced by that. This report will cover step by step how this deep convolutional network be implemented.
3.	Novelty / Uniqueness	One of the major decisions had to be made was choosing the suitable programming language satisfying our goal for extracting knowledge from our data. After some searching the suitable decision has been made by selecting Python as the project programming language. Due to the fact that, a lot of tools and frameworks are available for Python to create powerful Artificial Neural Networks. Also IBM Watson helps to predict future outcomes,automate complex processes and optimize user's time. And also the result accuracy will be increased from 70% which is the accuracy of the test results that the previous developed codes produced.
4.	Social Impact / Customer Satisfaction	It Reduction of Diabetic Retinopathy risk. It Provides Digital Assistance. It is Very helpful in making decisions faster. It Can be used 24x7.
5.	Business Model (Revenue Model)	This can be implemented as an essential diagnosis method in every hospital. Accurate detection and analysis can encourage the increase in financial benefit. It can collaborate with the government for health awareness camps.
6.	Scalability of the Solution	Accurate predictions and extensive use. Based on the times of the correct diagnosis. Availability. This project will help us to detect DR more precisely than the existing methodologies. Also it can produce a result which specifies the stages of Diabetic Retinopathy