Project Design Phase-I
Proposed Solution Template

Date	27th September 2022
Team ID	PNT2022TMID05405
Project Name	Deep Learning Fundus Image Analysis for Early Detection of Diabetic Retinopathy

Proposed Solution Template:

S No	Parameter	Description
1	Problem Statement (Problem to be solved)	Diabetic Retinopathy (DR) is a common complication of diabetes mellitus, which causes lesions on the retina that affect vision. If it is not detected early, it can lead to blindness. Unfortunately, DR is not a reversible process, and treatment only sustains vision. Early detection and treatment of DR can significantly reduce the risk of vision loss.
2	Idea / Solution description	To automate the existing manual diagnosis of DR by using transfer learning-based image processing techniques to simplify, speed up the diagnosis and to improve the accuracy of the images acquired
3	Novelty / Uniqueness	To develop a new CNN architecture based on renowned transfer learning models such as Inception v3, Resnet50 and Xception v3 etc. and accelerate the learning process. We also aim to increase the accuracy of the acquired images for better prognosis.
4	Social Impact / Customer Satisfaction	This model will be discharged in the form of an application which embeds the CNN into a lucid UI. Therefore, the patients wouldn't have to undergo strenuous physical examination anymore. The application can further be extended in order to summarise the reports and conclusion of the diagnosis which would help the patient to acknowledge and understand the issue that he/she is suffering from (if any).

5	Business Model (Revenue Model)	This can be very well classified under a B2C (Business to Consumer) model. The diagnostic capabilities of a hospital would increase exponentially and the app can be used effectively by physicians for the examination of diabetic as well as non-diabetic patients as and when they come for routine eye check-ups or screening etc.
6	Scalability of the Solution	The proposed idea will result in the formulation of an adaptive CNN model which will automatically detect even the different types of DR (proliferative and nonproliferative). It will also be programmed to diagnose other eye related repercussions of diabetes such as glaucoma, macular edema and cataracts etc. Therefore, the proposed model can be concluded as a highly scalable one