Project Design Phase-I
Proposed Solution Template

Date	22 September 2022
Team ID	PNT2022TMID17830
Project Name	Deep Learning Fundus Image Analysis for Early Detection of Diabetic Retinopathy
Maximum Marks	2 Marks

Proposed Solution Template:

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Diabetic Retinopathy (DR) is a common complication of diabetes mellitus (Type 1 diabetes) 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. DR early detection and treatment can significantly reduce the risk of vision loss. The manual diagnosis process of DR retina fundus images by ophthalmologists is time, effort and cost-consuming and prone to misdiagnosis unlike computer-aided diagnosis systems.
2.	Idea / Solution description	Transfer learning has become one of the most common techniques that has achieved better performance in many areas, especially in medical image analysis and classification. We used Transfer Learning techniques like Inception V3,Resnet50,Xception V3 that are more widely used as a transfer learning method in medical image analysis and they are highly effective. Laser treatment that treats the new blood vessels at the back of the eyes at the advanced stages of diabetic retinopathy
3.	Novelty / Uniqueness	The levels of diabetic retinopathy are analyzed to provide dosage of anti-VEGF drugs namely ranibizumab (RBZ) or bevacizumab (BVZ) with laser treatment
4.	Social Impact / Customer Satisfaction	The accuracy of the levels of DR prediction is high so that mispredictions are avoided. Since the level is known, the safe prescription to the ophthalmologist is given.

5.	Business Model (Revenue Model)	There are lot of diabetic retinopathy patients in India, thus would widen the customer range. Ophthalmologists are also target customers they are also benefited hence this adds to the revenue.
6.	Scalability of the Solution	**Online access** As deployed from the web portal, it can be accessed even from a simple desktop with limited computing resources. **Offline Access** The above solution is also deployed offline in the clinics.