

Project Design Phase
Proposed Solution Template

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| Date | 15 February 2025 |
| Team ID | LTVIP2026TMIDS65625 |
| Project Name | Deep Learning Fundus Image Analysis for Early Detection of Diabetic Retinopathy |
| Maximum Marks | 2 Marks |

Proposed Solution Template:

Project team shall fill the following information in the proposed solution template.

| S.No. | Parameter | Description |
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| 1. | Problem Statement (Problem to be solved) | Diabetic Retinopathy (DR) is a serious eye disease caused by diabetes that can lead to vision loss if not detected early. Manual examination of retinal fundus images requires skilled ophthalmologists and takes time. In rural or underdeveloped areas, access to eye specialists is limited. Hence, there is a need for an automated, fast, and accurate system for early detection of Diabetic Retinopathy using fundus images. |
| 2. | Idea / Solution description | <p>The proposed solution uses Deep Learning techniques (CNN-based model) to analyze retinal fundus images and automatically detect the stage of Diabetic Retinopathy.</p> <p>The system allows users to:</p> <ul style="list-style-type: none">• Upload fundus images• Analyze images using trained deep learning model• Classify DR stages (No DR / Mild / Moderate / Severe / Proliferative)• Generate prediction report <p>This helps in early diagnosis and timely medical intervention.</p> |
| 3. | Novelty / Uniqueness | <ul style="list-style-type: none">• Uses Deep Learning for automated DR stage classification• Provides quick and accurate prediction• Reduces dependency on manual screening• Can be deployed as a web or cloud-based solution• Useful for remote healthcare services |
| 4. | Social Impact / Customer Satisfaction | <ul style="list-style-type: none">• Helps in early detection of eye disease• Prevents blindness through early treatment |

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| | | <ul style="list-style-type: none"> • Useful for rural healthcare centers • Saves time and cost of manual diagnosis • Increases patient awareness about diabetic complications |
| 5. | Business Model (Revenue Model) | <ul style="list-style-type: none"> • Subscription model for hospitals and clinics • Pay-per-scan model • SaaS (Software as a Service) deployment • Partnership with diagnostic centers • Government healthcare collaboration |
| 6. | Scalability of the Solution | <ul style="list-style-type: none"> • Cloud-based deployment • Can handle multiple users simultaneously • Can be expanded to detect other eye diseases • Suitable for integration with hospital management systems |