Project Design Phase-II
Solution Requirements (Functional & Non-functional)

Date	19 feb 2026
Team ID	LTVIP2026TMIDS65645
Project Name	Deep Learning Fundus Image Analysis for Early Detection of Diabetic Retinopathy
Maximum Marks	4 Marks

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	• Registration through Form • Registration through Gmail • Registration through LinkedIn
FR-2	User Confirmation	• Confirmation via Email • Confirmation via OTP
FR-3	Fundus Image Management	• Upload Fundus Image (JPG/PNG) • Validate Image Format • Store Image Securely • View Uploaded Images
FR-4	Image Preprocessing	• Resize Image • Noise Removal • Contrast Enhancement • Normalization
FR-5	DR Detection & Classification	• Apply Trained CNN Model • Extract Features Automatically • Classify DR Stage (No DR, Mild, Moderate, Severe, Proliferative) • Display Confidence Score
FR-6	Report Generation	• Generate Diagnostic Report • Download Report (PDF) • View Prediction History
FR-7	Dashboard & Visualization	• Display DR Severity Graph • Show Prediction Summary • Patient Record Management
FR-8	Admin Management	• Manage Users • Manage Dataset • Retrain Model • View System Logs
FR-9	Security & Access Control	• Secure Login • Role-Based Access (Doctor/Admin/Patient) • Data Encryption • Logout Functionality

Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	The system shall provide a simple, intuitive, and user-friendly interface for doctors, technicians, and patients. Image upload and

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		report viewing should require minimal steps. The dashboard should clearly display DR stage and confidence score.
NFR-2	Security	The system shall ensure secure authentication and authorization using encrypted passwords, role-based access control, and HTTPS communication. Patient data and medical images must be stored securely with encryption and access restrictions.
NFR-3	Reliability	The system shall provide consistent and accurate predictions with minimal failure rate. It should handle image processing errors gracefully and ensure data integrity during storage and retrieval.
NFR-4	Performance	The system shall process and predict the DR stage within a defined response time (e.g., less than 5 seconds per image under normal load). It should efficiently handle multiple concurrent users.
NFR-5	Availability	The system shall be available 24/7 with minimal downtime. Cloud deployment and backup mechanisms should ensure continuous service access.
NFR-6	Scalability	The system shall support increasing numbers of users and image uploads by scaling vertically or horizontally (e.g., cloud-based infrastructure and load balancing).