

# Project Planning Phase

## Project Planning

Date	15 February 2026
Team ID	LTVIP2026TMIDS81330
Project Name	Deep Learning Fundus Image Analysis for Early Detection of Diabetic Retinopathy
Maximum Marks	5 Marks

### 1. Overview

Project planning defines the complete workflow of the Diabetic Retinopathy Detection System. It includes:

- Medical understanding
- Data pipeline setup
- Model selection
- System integration
- Deployment strategy

### 2. Complete Workflow Plan

The system follows this structured flow:

#### Step 1: Data Acquisition

Collect labeled retinal fundus images.

#### Step 2: Data Preprocessing

Resize, normalize, and augment images.

#### Step 3: Model Selection

Choose Xception (Transfer Learning based CNN).

#### Step 4: Model Training

Train on preprocessed dataset.

#### Step 5: Model Evaluation

Measure:

- Accuracy
- Precision
- Recall
- F1 Score
- Confusion Matrix

### **Step 6: Model Saving**

Save trained model as:

Updated-Xception-diabetic-retinopathy.h5

### **Step 7: Backend Development**

Use Flask to:

- Load model
- Handle image uploads
- Predict class
- Return result

### **Step 8: Frontend Development**

Develop medical dashboard with:

- User registration/login
- Retina scan upload
- Animated prediction display
- Confidence visualization

### **Step 9: Database Integration**

Cloudant DB stores:

- User credentials
- Session details

## **3. Risk Analysis & Planning**

<b>Risk</b>	<b>Solution</b>
Overfitting	Data augmentation
Class imbalance	Balanced sampling
Slow inference	Model optimization
Security issues	Session management

## 4. Deployment Planning

The application is designed to:

- Run locally (Flask server)
- Deploy using Ngrok (for testing)
- Future upgrade to Cloud deployment (AWS / IBM Cloud)

## 5. Resource Planning

Hardware

- GPU (for training)
- CPU (for deployment)

Software

- Python 3.x
- TensorFlow / Keras
- Flask
- Cloudant DB
- HTML/CSS/JS

## 6. Timeline Planning

Phase	Duration
Data Preparation	1 Week
Model Training	1 Week
Backend Development	1 Week
Frontend Development	1 Week
Testing & Integration	1 Week

## 7. Expected Outcomes

After completing the planning phase:

- ✓ Accurate DR stage classification
- ✓ Secure medical web application
- ✓ User-friendly interface
- ✓ Real-time prediction system

## **8. Conclusion**

The Project Planning Phase ensured a structured, systematic, and medical-grade AI system development. Proper planning reduced risks, improved performance, and ensured smooth integration between model, database, and user interface.