Project Initialization and Planning Phase

Date	19 June 2025
Team ID	SWTID1749821186
Project Title	Enhancing Product Reliability: Leveraging Transfer Learning for Fault Detection
Maximum Marks	3 Marks

Project Proposal

Project Overview	
Objective	To automate the detection of casting defects in manufacturing products using a deep learning model integrated into a web-based interface.
Scope	The project focuses on binary classification of casting products (defective vs. Good) using image data. It includes model training, evaluation and deployment through Flask-based web application.
Problem Statement	
Description	Manual inspection of casting products is time-consuming, inconsistent and prone to human error. This can lead to undetected defects, rejected orders and financial losses in manufacturing.
Impact	Automating the inspection process improves accuracy, reduces inspection time, minimizes human error and helps maintain product quality ultimately reducing waste and increasing customer satisfaction.
Proposed Solution	
Approach	Use transfer learning to classify casting product images. The trained model is deployed via a Flask web app, allowing users to upload images for prediction.
Key Features	• Deep learning model trained on real industrial casting data

	• Binary classification: detects defective vs. good products • Transfer learning for efficient training • Flask-based web application for real-time image prediction • Tailwind CSS for responsive and modern UI • Upload form with error handling and result display • Modular structure for easy maintenance and scalability

Resource Requirements

Resource Type	Description	Specification/Allocation
Hardware		
Computing Resources	CPU/GPU for model training	2 x NVIDIA V100 GPUs or equaivalent
Memory	RAM for training and inference	8 GB RAM
Storage	Disk space for data and models	1 TB SSD
Software		
Frameworks	Python web framework	Flask
Libraries	Deep learning and utilities	Tensorflow, Keras, Numpy, PIL
Development Environment	IDE and version control	Google colab, VS code, Git
Data		
Data	Source, size and format	Kaggle dataset, 7348 images