Project Initialization and Planning Phase

Date	20 June 2024
Team ID	740019
Project Title	3D Printer Material Prediction Using Machine Learning
Maximum Marks	3 Marks

Project Proposal (Proposed Solution) template

Utilize machine learning to predict optimal 3D printing materials. Research, collect data, preprocess, develop models, and validate predictions to streamline material selection, enhancing printing efficiency and product quality.

Project Overview	
Objective	Develop a system to enhance material selection for 3D printing.
Scope	Research, data collection, model development, validation, and implementation.
Problem Statement	
Description	Utilize machine learning to automate material selection based on printing requirements.
Impact	Improve printing efficiency and product quality by optimizing material choices.
Proposed Solution	
Approach	Research, data preprocessing, model development, training, validation, and system integration.
Key Features	Automated material selection, accuracy in predictions, user interface design.

Resource Requirements

Resource Type	Description	Specification/Allocation
Hardware		
Computing Resources	High-performance CPU/GPU for model training and inference.	2 GPUs (NVIDIA RTX 3090)
Memory	Sufficient RAM for handling large datasets and model operations.	64 GB RAM
Storage	High-capacity storage for storing datasets and model checkpoints.	1 TB SSD
Software		
Frameworks	TensorFlow or PyTorch for machine learning model development.	TensorFlow 2.0, Scikit-learn
Libraries	Scikit-learn, Pandas, NumPy for data preprocessing and analysis.	Pandas, NumPy, Matplotlib
Development Environment	Python IDE (e.g., Jupyter Notebook) and version control (e.g., Git).	Jupyter Notebook, Git
Data		
Data	Diverse dataset of 3D printing materials, including properties and costs.	10,000 samples of 3D printing material data