

Project Initialization and Planning Phase

Date	28-07-2025
Team ID	HK
Project Title	Predicting Plant Growth Stages with Environmental and Management Data Using Power BI
Maximum Marks	3 Marks

Project Proposal

Project proposal outlines a solution to address a specific problem. With a clear objective, defined scope, and a concise problem statement, the proposed solution details the approach, key features, and resource requirements, including hardware, software, and personnel.

Project Proposal

Project Overview	
Section	Details
Objective	The primary objective of this project is to design an interactive Power BI dashboard that visualizes the effects of environmental and operational factors (such as soil type, irrigation frequency, sunlight, humidity, and fertilizers) on plant growth, enabling farmers and Agri-policy makers to make data-driven decisions in smart farming.
Scope	The scope of this project includes: - Collecting and cleaning agricultural and environmental datasets - Creating meaningful visualizations using Power BI - Analysing the relationships between variables affecting plant growth - Providing actionable insights through user-friendly dashboards The project is limited to a single growing season and controlled environment data, with future potential for real-time integration and scaling.
Problem Statement	
Section	Details

Description	Farmers and agriculture professionals lack access to visual, data-driven insights that could help optimize irrigation, fertilizer use, and soil selection for better crop yield. Decisions are still largely made based on experience or traditional practices, which may not be efficient under changing climate conditions.
Impact	Solving this problem empowers users with data-backed decisions, leading to: - Improved crop yield and resource optimization - Reduced wastage of water and fertilizer - Increased awareness and adoption of smart farming technologies - Potential for scaling toward precision agriculture at regional and national levels
Proposed Solution	
Section	Details
Approach	Collect data from public sources and experimental setups - Clean, preprocess, and analyse data in Power BI - Design interactive visualizations using charts, slicers, decomposition trees, and key influencers - Provide insights into which environmental conditions and farming inputs lead to optimal growth - Summarize findings into actionable suggestions for farmers and policy makers
Key Features	Dynamic filters for soil type, irrigation, and fertilizer selection - Decomposition tree for analysing growth by soil types - Key influencers visual to identify major drivers of growth - Donut charts and bar graphs for comparing fertilizer and humidity impact - Environment score calculation to simplify multi-variable evaluation - Data-driven recommendations for smart irrigation practices

Resource Requirements

Resource Type	Description	Specification/Allocation
Hardware		
Computing Resource	s CPU/GPU specifications, number of cores	2 x NVIDIA V100 GPUs
Memory	RAM specifications	8 GB
Storage	Disk space for data, models, and logs	1 TB SSD
Software		
Frameworks	Python frameworks	Flask

Libraries	Additional libraries	scikit-learn, pandas, NumPy
Development Environment	IDE, version control	Jupyter Notebook, Git
Data		
Data	Source, size, format	Kaggle dataset, 10,000 images