## Project Initialization and Planning Phase

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| Date | 25 july 2025 |
| Team ID | Samant saini |
| Project Title | Predicting Plant Growth Stages with Environmental and Management Data Using Power BI |
| Maximum Marks | 3 Marks |

### Project Proposal (Proposed Solution) template

This 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 Overview** | |
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| Objective | To predict plant growth stages using environmental and management data by leveraging Power BI visualizations and models. |
| Scope | The project focuses on analyzing factors such as soil type, sunlight hours, watering frequency, fertilizer type, temperature, and humidity to predict and improve plant growth across different farming setups and greenhouses. |
| **Problem Statement** | |
| Description | Inconsistent plant growth across greenhouse and organic farming environments due to lack of data-driven insights into optimal growth conditions. |
| Impact | Solving this issue will allow agricultural businesses to standardize optimal growth conditions, resulting in improved yields, better resource allocation, and more sustainable farming practices. |
| **Proposed Solution** | |
| Approach | Use Power BI to develop predictive analytics dashboards with decomposition trees, bar charts, pie charts, and scatter plots, enhanced by calculated measures and columns. These visuals will help uncover the optimal combinations of environmental and management variables that influence plant growth. |

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| Key Features | - Decomposition tree for breakdown analysis<br>- Interactive Power BI dashboards<br>- Predictive models using calculated columns<br>- Insight into best soil-fertilizer-water combos<br>- Support for smart sensor validation and recommendations |

**Resource Requirements**

| **Resource Type** | **Description** | **Specification/Allocation** |
|---|---|---|
| **Hardware** | | |
| Computing Resources | CPU/GPU specifications, number of cores | 2 x NVIDIA V100 GPUs or equivalent Azure Power BI Embedded capacity (A3/A4 SKU) |
| Memory | RAM specifications | 8–16 GB RAM (local for development), scalable cloud memory for large datasets |
| Storage | Disk space for data, models, and logs | 1 TB SSD for storing historical data, Power BI datasets, and logs |
| **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 |