**Project Initialization and Planning Phase**

| Date | 5 oct 2025 |
| --- | --- |
| Team ID | SWUID20250216152 |
| Project Title | Predicting plant growth stages with environmental and management factors. |
| Maximum Marks | 3 Marks |

**Project Proposal (Proposed Solution) template**

This project focuses on leveraging Power BI to analyze environmental and management data to predict plant growth stages. By combining key factors such as soil type, sunlight hours, water frequency, fertilizer type, temperature, and humidity, the project aims to develop a data-driven decision support system for optimizing crop growth and greenhouse management.

| **Project Overview** | |
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| Objective | To design and implement a **Power BI-based analytical solution** that visualizes environmental and management parameters and predicts plant growth stages, helping to improve crop yield and promote sustainable agricultural practices. |
| Scope | · Analyze agricultural data to identify relationships between growth conditions and plant stages.  · Develop interactive Power BI dashboards with visual insights.  · Incorporate predictive analytics using Power BI and Python integration.  · Enable decision-makers to monitor, evaluate, and optimize growth conditions in real time.  *Out of Scope:*  · Real-time IoT sensor integration (future enhancement).  · Automation of environmental control systems. |
| **Problem Statement** | |
| Description | XYZ Company faces challenges in maintaining consistent plant growth due to varying environmental and management conditions. The lack of an integrated system to visualize and analyze these variables makes it difficult to identify optimal growth patterns. |
| Impact | Solving this problem will enable the company to:  · Standardize growing conditions across locations.  · Increase productivity through predictive insights.  · Reduce manual monitoring and resource wastage. |
| **Proposed Solution** | |
| Approach | The project will employ Power BI to connect, clean, and visualize data from greenhouse environments. Using **Power Query** for preprocessing, the system will identify patterns and forecast plant growth milestones.  **Key Steps:**  1. Collect and preprocess environmental & management data.  2. Use Power BI to create visual dashboards and decomposition trees.  3. Deliver insights through interactive dashboards. |
| Key Features | · Decomposition Tree for factor impact analysis.  · Interactive filters for soil, fertilizer, and watering types.  · Predictive cards showing expected growth stages.  · Real-time visual comparison across greenhouse conditions. |

**Resource Requirements**

| **Resource Type** | **Description** | **Specification/Allocation** |
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| **Hardware** | | |
| Computing Resources | CPU/GPU specifications, number of cores | Dell laptop |
| Memory | RAM specifications | e.g., 8 GB |
| Storage | Disk space for data, models, and logs | e.g., 1 TB SSD |
| **Software** | | |
| Frameworks | Microsoft Power BI Desktop | Power BI |
| Libraries | Built in Power BI Desktop | Data Visualization |
| Development Environment | Power BI Desktop | Power BI Desktop |
| **Data** | | |
| Data | Kaggle dataset: predicting plant growth milestone with environmental and management factors | e.g., Kaggle dataset, images |