# Project Initialization and Planning Phase

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| Date | 28-07-2025 |
| Team ID | Simran Gupta |
| 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

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| **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 |

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# Resource Requirements

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| **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 |

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