**Project Initialization and Planning Phase**

|  |  |
| --- | --- |
| Date | 15 March 2024 |
| Team ID | LTVIP2025TMID26725 |
| Project Title | Visualization Tool for Electric Vehicle Charge and Range Analysis |
| 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** | |
| Objective | The primary objective of this project is to analyze and visualize electric vehicle (EV) charging patterns, battery efficiency, and driving range using Tableau. The goal is to provide a detailed overview of charging behavior, energy consumption, and range variations under different conditions. The insights will help EV users, fleet operators, and policymakers optimize charging strategies and improve overall EV efficiency. |
| Scope | The scope of this project includes:   * Collection and analysis of EV charging data, battery performance, and driving range metrics. * Creating interactive and insightful visualizations using Tableau to highlight trends in charging habits, efficiency, and energy consumption. * Developing a user-friendly dashboard to help stakeholders explore key factors affecting EV performance and range. * Identifying correlations between charging patterns, environmental conditions, and range efficiency to provide actionable recommendations. |
|  | |
| **Problem Statement** | |
| Description | Electric vehicles (EVs) generate vast amounts of data on charging patterns, battery efficiency, and range. However, analyzing this data to optimize charging strategies and improve range efficiency is challenging. This project uses Tableau to create interactive visualizations, making EV charge and range insights more accessible for users, fleet managers, and policymakers. |
| Impact | * By solving this problem, the project will make data about electric vehicle (EV) charging and range analysis easily accessible, helping: * EV Owners & Drivers: Optimize trip planning by understanding charging station locations, range limitations, and charging efficiency. * City Planners & Policymakers: Identify trends in EV usage to improve charging infrastructure and support sustainable urban mobility. * Environmental Analysts: Assess the impact of EV adoption on carbon emissions and energy consumption.. |
| **Proposed Solution** | |
| Approach | The methodology for this project involves the following key steps:   1. **Data Collection**: Collect data on UNESCO World Heritage Sites, including location, cultural significance, visitor numbers, and status of preservation. 2. **Data Preparation**: Clean and preprocess the collected data to ensure its accuracy and compatibility for analysis in Tableau. 3. **Visualization Development**: Use Tableau to create interactive dashboards and visualizations that present the data in a user-friendly and engaging manner. 4. **User Testing**: Conduct user testing to gather feedback and refine the visualizations for ease of use and effectiveness. 5. **Deployment**: Publish the final interactive dashboard for public access. |
| Key Features | * **Geographical Mapping**: Interactive maps to visualize the global distribution of UNESCO World Heritage Sites. * **Historical Trends**: Visualizations that track the number of heritage sites added over time. * **Visitor Statistics**: Insights into annual visitors and how they impact the preservation and popularity of sites. * **Search and Filter Options**: Ability to filter by site type (cultural, natural, mixed), geographical region, or year of inscription. * **Preservation Status**: Status indicators showing whether a site is endangered or well-preserved. |

**Resource Requirements**

|  |  |  |
| --- | --- | --- |
| **Resource Type** | **Description** | **Specification/Allocation** |
| **Hardware** | | |

| Computing Resources | High-performance system for data processing and visualization development | Example: Intel Core i7 or higher processor, 4 cores, 3.0 GHz or faster |
| --- | --- | --- |
| Memory | Sufficient RAM for smooth operation of Tableau and data processing | Example: 16 GB RAM |
| Storage | Adequate disk space to store large datasets and Tableau files | Example: 500 GB SSD |
| **Software** | | |
| Frameworks | Tableau for visualization and analysis | Example: Tableau Desktop or Tableau Public for creating visualizations |
| Libraries | Python for data cleaning and preprocessing (if needed) | Example: pandas, numpy, matplotlib for data preparation |
| Development Environment | Integrated development environment (IDE) for Python scripting and version control for code collaboration | Example: Jupyter Notebook, Git, GitHub |
|  | | |
| **Data** | | |
| Data | **Data Source**: Government EV infrastructure database | * Example: CSV or Excel format * Size: ~500-1000 records (depending on the data included) * Format: CSV, Excel, or JSON (depending on data availability) |