Project Planning Phase
Project Planning

Date	16 February 2026
Team ID	LTVIP2026TMIDS90282
Project Name	Weather-Based Prediction of Wind Turbine Energy Output: A Next-Generation Approach to Renewable Energy Management
Maximum Marks	

Project Planning:

The project planning process involves defining objectives, identifying required resources, and structuring the development workflow to ensure timely and successful implementation. The overall goal is to build a weather-based wind energy prediction system that is accurate, efficient, and user-friendly.

The planning begins with understanding the problem domain. The need for accurate wind energy prediction is identified as a key requirement for renewable energy management. Based on this requirement, the project objectives are clearly defined, including data analysis, model development, evaluation, and deployment.

Once preprocessing is completed, the dataset is divided into training and testing sets. This step is crucial to evaluate the performance of the machine learning algorithm on unseen data. A proper split ensures that the model generalizes well and avoids overfitting.

Resource planning plays a significant role in this phase. The technologies required for the project include Python programming language, machine learning libraries such as Scikit-learn, data analysis libraries like Pandas and NumPy, visualization tools such as Matplotlib and Seaborn, and the Flask framework for web deployment. Version control using Git and GitHub is also included in the planning.

Time management is another important component of project planning. The development process is divided into structured phases: data collection, preprocessing, model building, evaluation, application development, and testing. Each phase is allocated sufficient time to ensure quality work and proper documentation.

Risk assessment is also considered during planning. Potential challenges such as incomplete datasets, overfitting of the model, or deployment issues are identified. Strategies such as proper data validation, evaluation metrics, and modular design are planned to mitigate these risks.

The integration planning ensures that the machine learning model and the web application work seamlessly together. The trained model is saved as a .sav file and loaded within the Flask application to enable real-time predictions. This integration step is crucial for transforming the project from a theoretical model into a practical system.

Overall, the project planning phase ensures that the development process is organized, efficient, and aligned with the project objectives. A well-defined plan enables smooth execution, better coordination, and successful completion of the wind turbine energy prediction system.