

Project Design Phase-II
Technology Stack (Architecture & Stack)

Date	03 October 2022
Team ID	591312
Project Name	Project – Solar Panel Forecasting
Maximum Marks	4 Marks

Technical Architecture:

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2

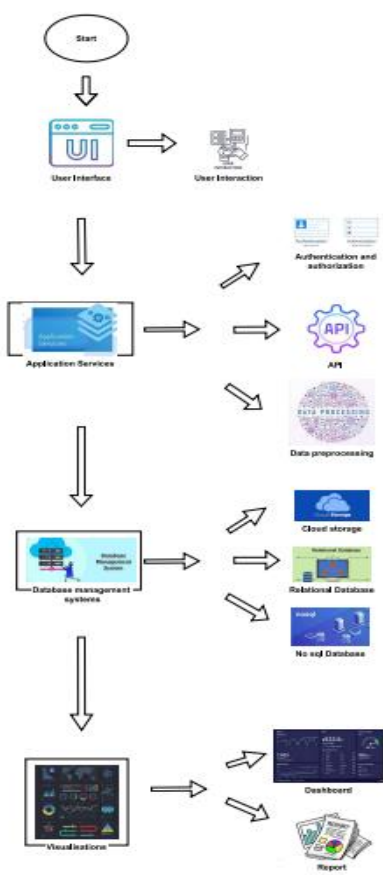


Table-1 : Components & Technologies:

S.No	Component	Technology	Description
1.	Solar panel data	Data Preprocessing, Statistical Models, Machine Learning Models, Deep Learning, Predictive Analytics	Data Preprocessing, Statistical Models, Machine Learning Models, Deep Learning, Predictive Analytics
2.	Weather Data	Numerical Weather Models, Weather Forecast APIs	Meteorological data like temperature, irradiance, cloud cover, wind speed, and humidity.
3.	Data processing	Data Cleaning, Feature Engineering	Data cleaning, normalization, and feature engineering for forecasting models.
4.	Statistical Models	Time Series Analysis, Regression	Traditional methods like time series analysis and regression for short-term forecasts.
5.	Cloud computing	Scalable Cloud Platforms	Scalable cloud platforms for handling large datasets and intensive computations.
6.	Predictive Analytics	Predictive Maintenance Algorithms	Methods to predict system failures and maintenance based on historical data
7.	Web-Based Dashboards	User Interface Design	User-friendly interfaces for visualizing forecasting results and system performance.
8.	Edge Computing	On-site computing resources for real-time analysis and decision-making.	On-site computing resources for real-time analysis and decision-making.
9.	Geographic Information Systems (GIS)	Spatial Data Management	Tools for spatial analysis considering location-specific factors.
10.	Ensemble Methods	Bagging, Boosting, Stacking	Techniques combining multiple models for improved accuracy (e.g., Bagging, Boosting).

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Forecasting Timeframe	Short-term (hours to days) and Long-term (weeks to months) forecasting based on the desired application.	Statistical Models, Machine Learning, Weather Models
2.	Data Sources	Utilizes historical solar data, weather data, and potentially real-time solar data.	IoT Sensors, Weather Stations, Satellite Data.
3.	Accuracy	The accuracy of the forecasting method, ranging from low to high.	Numerical Weather Models
4.	Scalability	Scalability for different system sizes, from small installations to large solar farms.	Distributed Computing, Cloud-Based Solutions
5.	User Interface	User-friendly interfaces for visualization and decision-making	Web-Based Dashboards