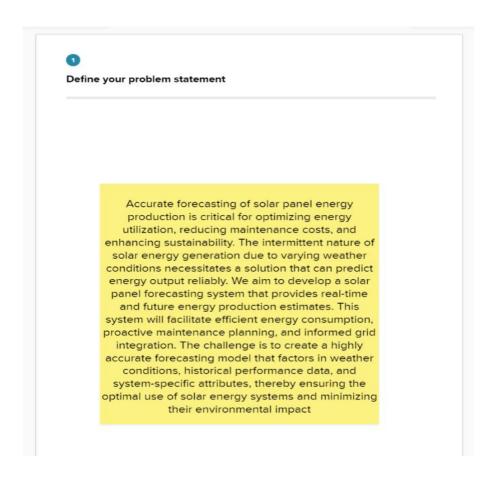
Ideation Phase Brainstorm & Idea Prioritization Template

Date	19 September 2023
Team ID	9C05B58063F2C7CAA384F87D2AA8CF21
Project Name	Solar panel forecasting
Maximum Marks	4 Marks

Brainstorm & Idea Prioritization:

In pursuit of an impactful solar panel forecasting project, we propose a range of ideas. The first concept involves the creation of a user-friendly mobile application that offers real-time solar panel performance forecasts for homeowners, facilitating optimized energy consumption and storage. Additionally, we suggest developing a community-based solar energy sharing platform, allowing neighbors to share excess energy, with forecasts ensuring grid stability and fair sharing. For the agricultural sector, we can build a tool that predicts solar energy availability, enabling farmers to optimize irrigation, livestock management, and crop planting. Furthermore, a disaster preparedness forecasting model can predict extreme weather event impacts on solar energy production, aiding in emergency planning and relief efforts. Implementing a solar energy trading marketplace where owners can buy and sell excess energy, guided by forecasts, is another valuable option

Step-1 Select the Problem Statement



Step-2: Brainstorm, Idea Listing and Grouping



Brainstorm

Write down any ideas that come to mind that address your problem statement.

Yuvasri

Data Collection:

Collect historical weather data, including irradiance (solar radiation), temperature, and cloud cover.

Gather historical solar panel performance data, considering factors like degradation over time.

Machine Learning Models:

Develop machine learning models (e.g., linear regression, random forest, neural networks) to predict solar panel output based on historical data. Explore models that can consider not only historical data but also real-time weather and atmospheric conditions.

Weather Forecast Integration:

Integrate weather forecast data from reliable sources to improve short-term predictions. This can help anticipate sudden changes in solar panel output due to weather conditions.

Anomaly Detection:

Liyashini

Anomaly Detection:

Implement anomaly detection algorithms to identify and account for sudden and unexpected drops in energy production, like cloud cover or heavy rain.

Time-Series Analysis:

Use time-series analysis to detect and predict daily and seasonal patterns in solar panel output.

Hybrid Models:

Combine different models, including physical models based on the PV system specifications and machine learning models, to improve forecasting accuracy.

Sarmila

Cloud Cover Prediction:

Develop cloud cover prediction models that can provide more accurate short-term forecasts by using cloud imaging or satellite data.

User Interface:

Create a user-friendly dashboard or web application to display forecasts, actual production, and system health in real-time. Optimization:

Integrate the forecasting model with optimization algorithms to manage energy storage, consumption, and grid interaction to maximize self-consumption and reduce costs.

Anusiya

Data Visualization:

Use data visualization techniques to present the forecasts and historical performance data to endusers or operators.

Maintenance Predictions:

Develop predictive models for solar panel maintenance based on historical data to reduce system downtime. API Integration:

Make the forecasting model accessible through APIs for easy integration with other systems and automation.



Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you and break it up into smaller sub-groups.

20 minutes

Solar Panel Maintenance Forecasting:

Create a predictive model that forecasts when solar panels may require maintenance or cleaning based on historical performance data and local environmental conditions. This can help reduce downtime and ensure optimal

Solar Energy Pricing
Forecast: Create a tool that
forecasts electricity prices
and aligns solar energy
production with peak pricing
periods, allowing users to
sell excess energy at higher
rates or optimize
consumption during low-cost
periods.

Energy Storage
Optimization: Develop a forecasting model that predicts energy production and consumption, allowing for optimized control of energy storage systems (e.g., batteries) to maximize self-consumption and grid interactions.

Demand Response
Forecasting: Predict energy
demand fluctuations and
provide forecasts to grid
operators and consumers,
enabling them to adjust their
energy consumption
patterns in response to
varying solar energy
production.

Environmental Impact
Assessment: Create a tool that
forecasts the environmental
impact of solar panel systems,
considering factors such as
reduced carbon emissions and
energy savings over time. This
information can be valuable
for sustainability reporting and
decision-making.

Solar Energy Investment ROI: Develop a forecasting tool that estimates the return on investment (ROI) for potential solar panel installations, considering location-specific data, electricity prices, and government incentives.

Step-3: Idea Prioritization

