

Ideation Phase

Brainstorm & Idea Prioritization Template

Date	17 September 2022
Team ID	PNT2022TMID35179
Project Name	Predicting the energy output of wind turbine based on weather condition
Maximum Marks	4 Marks

Brainstorm & Idea Prioritization Template:

Brainstorming provides a free and open environment that encourages everyone within a team to participate in the creative thinking process that leads to problem solving. Prioritizing volume over value, out-of-the-box ideas are welcome and built upon, and all participants are encouraged to collaborate, helping each other develop a rich amount of creative solutions.

Step-1: Team Gathering, Collaboration and Select the Problem Statement

Template

Brainstorm & idea prioritization

Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

🕒 10 minutes to prepare

🕒 1 hour to collaborate

👤 2-8 people recommended

📄 Share template feedback

Before you collaborate

A little bit of preparation goes a long way with this session. Here's what you need to do to get going.

🕒 10 minutes

A Team gathering

Define who should participate in the session and send an invite. Share relevant information or pre-work ahead.

B Set the goal

Think about the problem you'll be focusing on solving in the brainstorming session.

C Learn how to use the facilitation tools

Use the Facilitation Superpowers to run a happy and productive session.

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Define your problem statement

What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.

🕒 5 minutes

PROBLEM

How might we predict the energy output of wind turbine based on weather condition?

Key rules of brainstorming

To run an smooth and productive session

Stay in topic.

Encourage wild ideas.

Defer judgment.

Listen to others.

Go for volume.

If possible, be visual.

Step-2: Brainstorm, Idea Listing and Grouping

2 Brainstorm

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

10 minutes

Avantika

- Check wind direction and wind speed in different outdoor temperatures
- Check frequency of wind speed and determine if it's likely output energy

Sweta

- Rotor RPM wind direction is taken into consideration for determination
- spatiotemporal correlation - winds in different places affect each other - so we can use LSTM-CHN just model

Shruthi

- Check for height of windmill and determine the energy output
- Climatic condition of the wind farm is used primarily to calculate output energy
- output is forecasted accurately hence energy providers can keep away from costly overproduction

Subhiksha

- Map weather data to energy prediction and derive analysis
- user can upload their own real time dataset (csv or other formats) for forecasting

3 Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. In the last 10 minutes, 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

Various Inputs

- Check wind direction and wind speed in different outdoor temperatures
- Check frequency of wind speed and determine if it's likely output energy
- Check for height of windmill and determine the energy output
- temperature, pressure, wind direction, wind speed and flow generated by the system are taken as user inputs

Implementation ideas

- collect the historical data through the Supervisory Control and Data Acquisition system of wind farms and then filing curves
- spatiotemporal correlation - winds in different places affect each other - so we can use LSTM-CHN just model
- fuzzy model approach provides an interpretable model structure
- Map weather data to energy prediction and derive analysis

Physical factors contributing to output

- Number of windmills in a wind farm contribute to energy output
- Diameter of the rotor of a wind turbine plays a major role
- Rotor RPM wind direction is taken into consideration for determination
- output is forecasted accurately hence energy providers can keep away from costly overproduction

Results from the application

- Analyze model performance on different sites
- Post climatic conditions of the wind farm area are used in the analysis of energy prediction
- Climatic condition of the wind farm is used primarily to calculate output energy

Type of feeding dataset

- user can upload their own real time dataset (csv or other formats) for forecasting

Step-3: Idea Prioritization

4

Prioritize

Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

20 minutes

