Ideation Phase
Define the Problem Statements

Date	11 October 2022
Team ID	PNT2022TMID14768
Project Name	Predicting the energy output of wind turbine based on weather condition
Maximum Marks	2 Marks

Project Tile:

Predicting the energy output of wind turbine based on weather condition
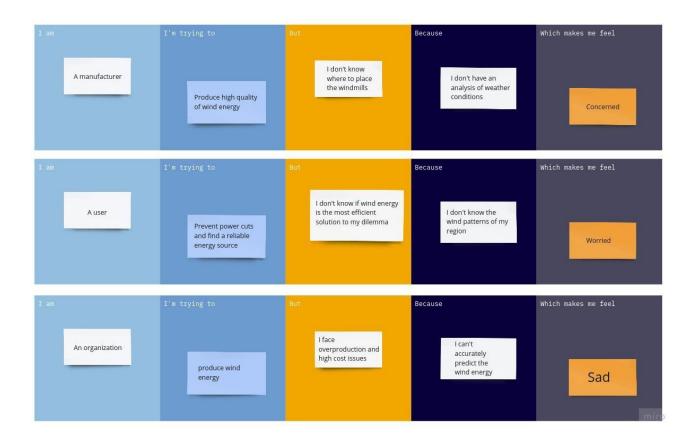
Problem statement:

The prediction of wind power plays an indispensable role in maintaining the stability of the entire power grid. Due to its renewable resources and environmental friendliness, wind speed/power has gained increasing interest worldwide. The wind industry is rapidly expanding into a large-scale industry as a result of the fast-rising amount of installed wind generating capacity worldwide. When it comes to scheduling power systems and other practical aspects of wind energy conversion, such as the dynamic management of wind turbines, reliable short-term wind speed forecasts are essential. A precise forecast is required to solve issues with variable energy production brought on by changing weather patterns. The wind speed has a big impact on how much power is produced by the wind. Despite being quite non-linear, wind speed exhibits a consistent pattern over a specific amount of time. Thus, wind power forecasting plays a key role in dealing with the challenges of balancing supply and demand in any electricity system, given the uncertainty associated with the wind farm power output.

Aim:

Wind power generation differs from conventional thermal generation due to the stochastic nature of wind. Therefore, we examine the impact of different weather conditions on the energy output of wind farms. Accurate wind power forecasting reduces the need for additional balancing energy and reserve power to integrate wind power. A prediction system is developed with a method of combining statistical models and physical models. In this system, the inlet condition of the wind farm is forecasted by the auto regressive model.

a. User interacts with the UI (User Interface) to enter Data.

b. The entered data is analyzed by the model which is integrated.

c. Once model analyses the input the prediction is showcased on the UI

I am	I'm trying to	But	Because	Which makes me feel
A manufacturer	Produce high quality of wind energy	I don't know where to place the windmills	I don't have an analysis of weather conditions	Concerned
A user	Prevent power cuts and find a reliable energy source	I don't know if wind energy is the most efficient solution to my dilemma	I don't know the wind patterns of my region	Worried
An organization	produce wind energy	I face overproduction and high cost issues	I can't accurately predict the wind energy	Sad

Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	manufacturer	Produce high quality of wind energy	I don't know where to place the windmills	I don't have an analysis of weather conditions	Concerned
PS-2	user	Prevent power cuts and find a reliable energy resource	I don't know if wind energy is the most efficient solution to my dilemma	I don't know the wind patterns of my region	Worried
PS-3	organization	Produce wind energy	I face overproduction and high-cost issues	I can't accurately predict the wind energy	sad