Predicting the Energy Output of Wind Turbine Based On Weather Condition

Literature review:

We are going to deploy an application that will utilize multiple Watson AI Services including Cloud function, Watson Machine Learning and Node-RED/other web frame-work services. During the course of this project, we'll learn about combining Watson services, and how they can build interactive customer satisfaction interactive portals for prediction on current conditions.

Pros:

- The Web Dashboard responds to weather conditions analysis that are not manually answered.
- We can improve results by training data to our choice of parameters.
- No need to search weather analysis in different sites.
- Easy to use and has a friendly user interface to work with.
- Companies can deploy to improve their energy harnessing efficiency.
- Reduces man power
- Can be used even in areas of less connectivity.
- Cost efficient
- The database maintained can allow companies, to easily monitor the access/users.
- Promotes Alternative resources of energy and drives a motto to use Clean & Green Fuel.

Cons:

- Requires all services that handles requests and renders responses.
- Requires some complex integration of services.

Applications:

- Several companies can use the service and deploy it on their own servers.
- This would save time and money as no three to four applications are needed.
- The service can be provided to users in application along with other features.
- Could be helpful even in areas with less connectivity.

- As the application is quite robust and resilient in its architecture it allows one to easily navigate   through different sections.

Existing Problem:

If we examine the problem statement we could easily identify that the problem statement talks of the problem that wind energy plays an important role in supply of energy but yet the harnessing of energy is not up to mark. Due to irregularities or vagaries in the atmospheric conditions and the wind available there is a substantial loss of the energy that could be utilized more efficiently.

Proposed Solution:

For the above problem to get solved we develop a time series model to predict the power output of wind farm based on the weather condition in the site (1Hr prediction to 72Hrs. prediction) Build an application to recommend the Power Grid to suggest the best time to utilize the energy from wind farm.

Problem Statement:

Wind energy plays an increasing role in the supply of energy world-wide. The energy output of a wind   farm is highly dependent on the wind conditions present at its site. If the output can be predicted more accurately energy suppliers can coordinate the collaborative production of different energy sources more efficiently to avoid costly overproduction.

Conclusion:

Energy prediction dashboard using Watson studio, Watson Machine Learning, Node-RED and Weather Data. The experimental investigations showed the integration of different IBM cloud services. The results show that the responses from the Application were relevant and helpful. Although, the Web- Application demands complex integration of services it can be deployed easily to leverage the energy prediction and improve the energy production, effectively. In conclusion, this project solves the problem of returning response of "Would this hour be the best to run the wind turbine?" or "Will the weather conditions be stable today?"