Short Term internship

Data analytics

Project Report

Project Name

Solar Panel Forecasting

Team members

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Introduction:-

During our short-term internship with Smart bridge. we've delved into the world of data analytics, with a primary focus on solar panel forecasting. In this introduction section, we'll provide an over-view of the importance of data visualization in conveying insights and our objective to create informative visualization, including dashboards, reports and data stories.

a. overview:-

Short-term forecasting provides predictions upto seven days a head. Due to the power market regulations in many jurisdictions, intra-day forecasts and day-a head solar power forecasts are the most important time horizons in this category. Basically all highly accurate short term forecasting methods leverage serval data input streams such as meteoro logical, local weather phenoma

and ground observations along with complex math -ematical models.

b, Purpose :-

Solar power forecasting is the process of the gathering and analyzing data in the order to predict solar power generation an various time of horizonal with the goal to mitigate the impact of solar intermitterecy solar power forecasts are used to for efficient management of the electric grid and power trading.

2. literature survey :-

Before delving into our own works, it is essential to review the existing literature on a solar panel forecasting. This section will provide a comprechevie look at prior research and established methods in a fields.

we will explore how data analytics and visuali -zation have been appiled in the context of the solar energy predictions.

a. Existing Problem:

- Solar panels are not always efficient in converting sunlight into energy
- Solar panels can be damaged by severe wether also enviromental porblem with solar panels.
- Solar panels require regular maintenance.
- Solar panels can be authetically displeasing
- Electrical issues: Solar panels are connected to the electrical grid. If not fixed, this can lead to loss of power or even a fire.

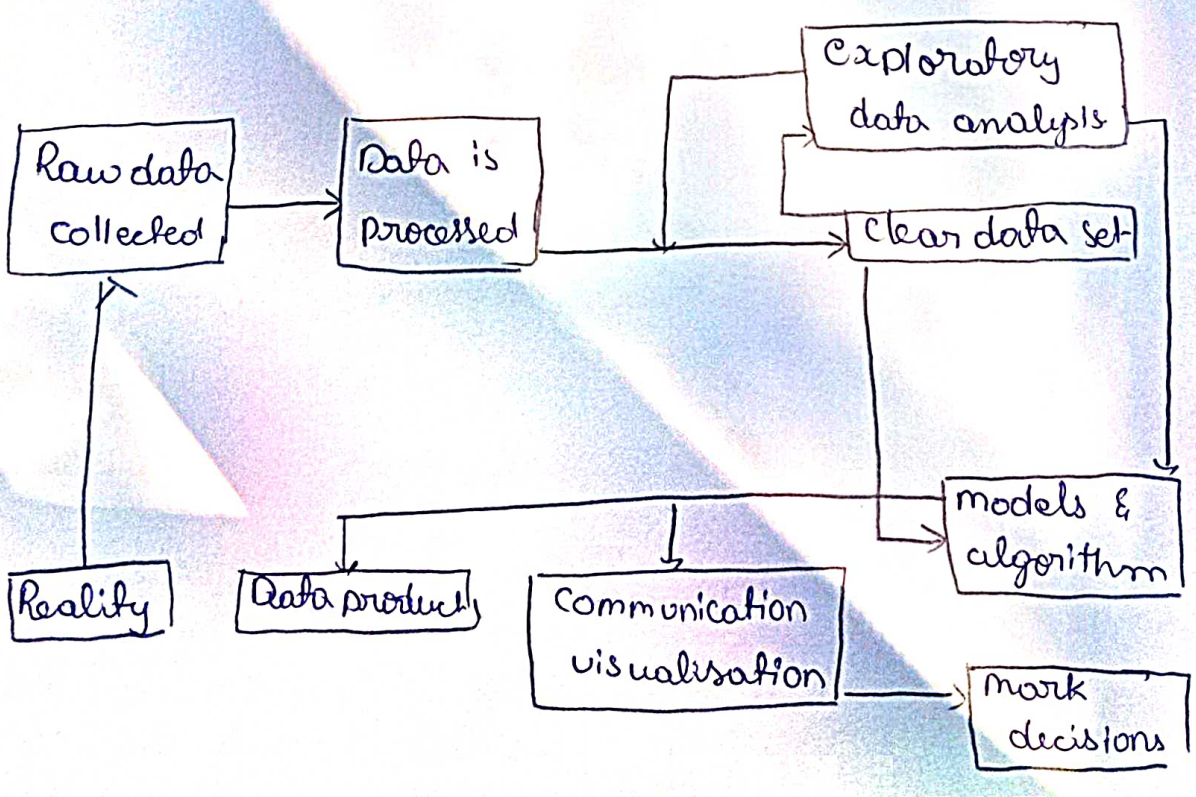
b. Proposed Solution:-

Solar forecasting solutions must be leverage a reliable and power solar data set as the basic for delivering a quality forcast. The solar forecast must be built on a foundation of trusted reliable and accurate solar data.

3. Theoritical Analysis:-

In this section, we will transition from the literature survey to our own theoretical analysis. we will delve into the principle, model and methodologies we have employed to fore-cast solar panel performance. This is where we outline the concepts and theories that underpin exist work including the factors considered in solar energy prediction.

4. Block Diagram:



b. Hardware / Software designing :-

Aurora Solar design software that helps th Solar companies quickly design photovoltaic syster that are tailored to each client's specific needs.

Open Solar is a free Solar design Solar and management software with a built in CRM. digital scheduling • real time customer alerts.

The collected data :-

- first hour of period.
- Is daylight
- Distance to Solar noon.
- Average temperature (day)
- Average wind direction (day)
- Average wind speed (day)
- Sky cover
- Visibility
- Humidity
- Average wind speed (period)

5. Advantages and Disadvantages.

Advantages :-

- clear energy source
- Reduction in electricity bill
- Multiple Applications
- low maintenance cost
- Independent source of Energy
- Sustainable
- lower water pollution.
- lower impact on environment.

Disadvantages :-

- Installation cost is too high
- Reliability
- lots space required for installition.
- Not efficient
- Pollution and impact on environment

6. Applications:-

Our work extends beyond the theoretical realm, as we aim to apply our finding in a practical Real Scenarios. This section will explore the real-world applications of a Solar panel forecasting including how our data analytics and visualizations can be used in Energy management, Solar panel installation planning and Sustainable Energy initiatives.

7. Conclusion:-

In this conclusion, we will summarize the significance of our internship project with the Smart bridge. This section will emphasize the value of the data analytics and data visualization in the context of a Solar pannel forecasting. We will reiterate the key takeaways from our work and highlight its potential impact on the field.

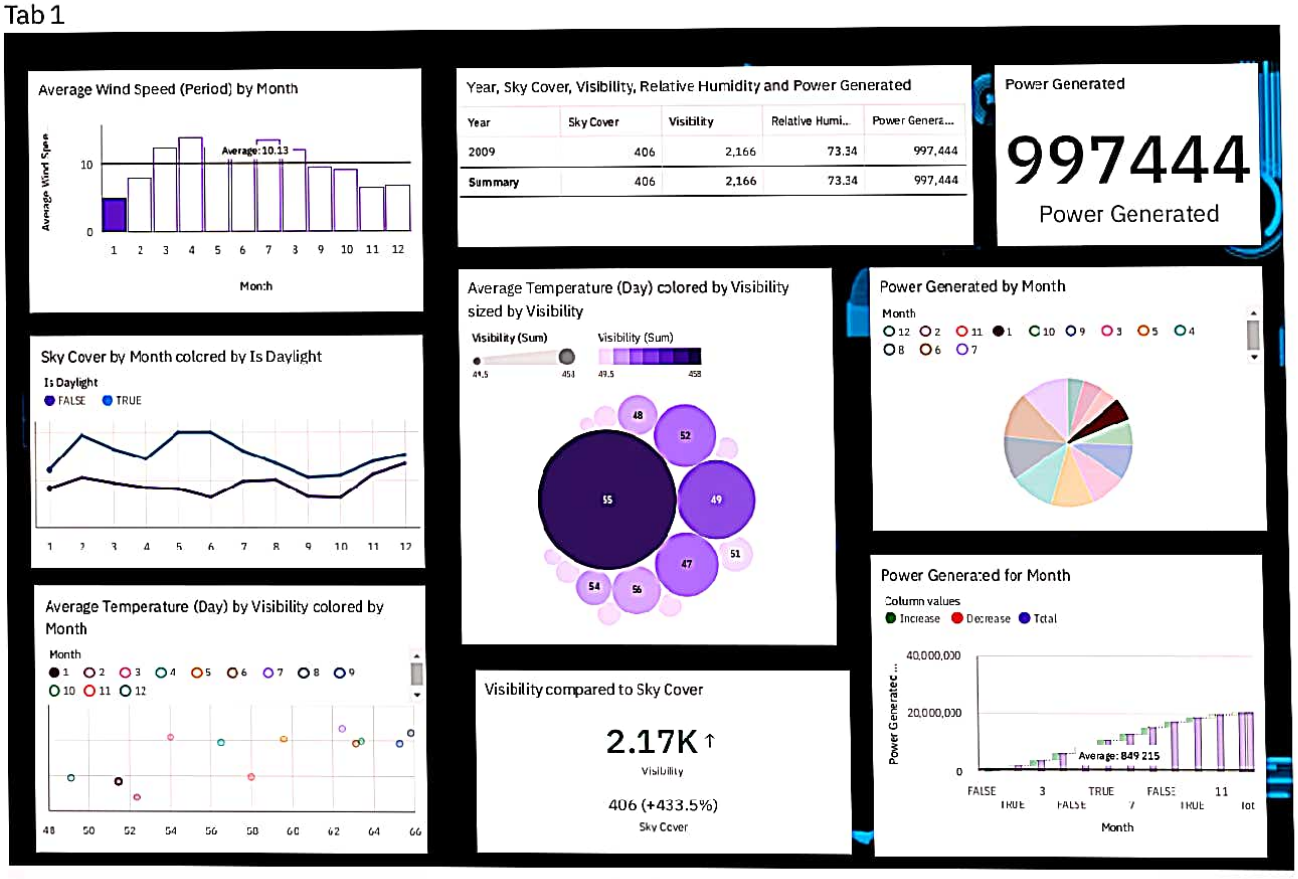
8. Future Scope :-

The future Scope Section will provide insights into what lies head. He will discuss potential areas for futher research and development in Solar panel forecasting. as well as how our work can serve as a foundation for future projects and innovations. This will open the door to on going exploration and improvement in the critical field.

Results:-

The results section will be delve into the specific findings we've uncovered during our internship. It will include a summary of the insights gained from our data visualization and analytical work. This section should highlight key takeaways from the project, such as notable trends, performance indicators, and data-driven recommendations.

Tab 1


Average Wind Speed (Period) by Month
Average Wind Spee
Average: 10.13
10
0
1 2 3 4 5 6 7 3 9 10 11 12
Month
Year, Sky Cover, Visibility, Relative Humidity and Power Generated
Year Sky Cover Visibility Relative Humi.. Power Genera...
2009 406 2,166 73.34 997,444
Summary 406 2,166 73.34 997,444
Power Generated
997444
Power Generated
Sky Cover by Month colcred by Is Daylight
Is Daylight
FALSE TRUE
1 2 3 4 5 6 7 8 9 10 11 12
Average Temperature (Day) colored by Visibility sized by Visibility
Visibility (Sum)
Visibility (Sum)
48 52 55 49 47 51 54 56
Power Generated by Month
Month
12 2 11 1 10 9 3 5 4 8 6 7
Average Temperature (Day) by Visibility colored by Month
Month
1 2 3 4 5 6 7 8 9 10 11 12
48 50 52 54 56 58 60 62 64 66
Visibility compared to Sky Cover
2.17K ↑
Visibility
406 (+433.5%)
Sky Cover
Power Generated for Month
Column values
Increase Decrease Total
40,000,000
20,000,000
0
Average: 849 215
FALSE 3 TRUE FALSE 11
Month

SOLAR PANEL FORECASTING

3.VISIBILITY COMPARED TO SKY COVER

- Based on the current forecasting, Sky Cover may reach 23.37 by Date 2009-11-12.
- Sky Cover has an unusually high value at time point 2009-02-04.
- The overall number of results for Sky Cover is nearly three thousand.

Visibility compared to Sky Cover

27.9K ↑

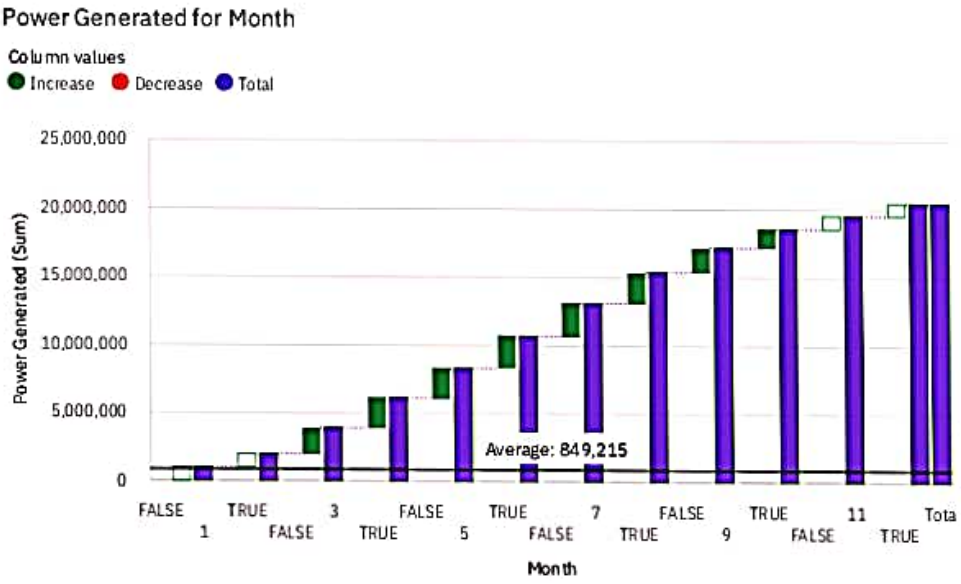
Visibility

5.8K (+380.85%)

Sky Cover

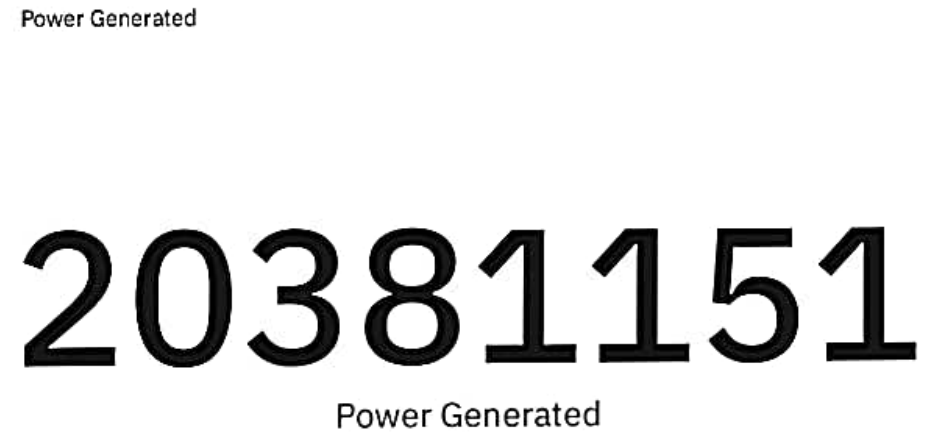
4. POWER GENERATED FOR VISIBILITY

- Power Generated is unusually high when the combination of Visibility and Is Daylight is 10 and TRUE.
- Power Generated is unusually high when Visibility is 10.
- Is Daylight TRUE has the highest Power Generated at over twenty million, out of which Visibility 10 contributed the most at over eighteen million.
- From 2009-04-23 to 2009-04-24, TRUE's Power Generated increased by 4491%.
- From 2009-04-23 to 2009-04-24, 10.0's Power Generated increased by 4491%.



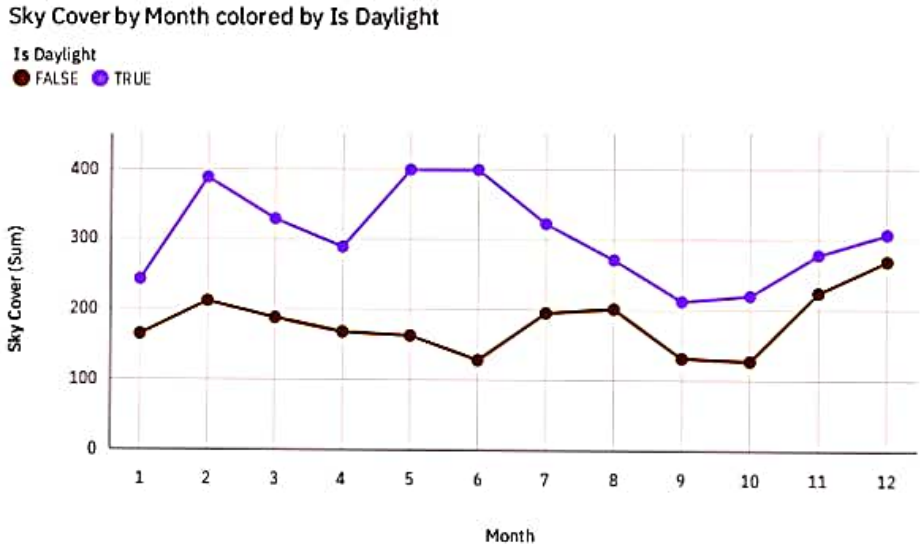
5.TOTAL POWER GENERATED

- Power Generated has a weak upward trend.
- Date 2008-10-11 and 2008-10-30 have the lowest total Power Generated at 0.0.
- Date 2009-05-20 has the highest total Power Generated at 97262.0, followed by 2009-07-06 at 97165.0.
- Based on the current forecasting, Power Generated may reach almost 60 thousand by Date 2009-11-12.



6.SKY COVER BY MONTH BY ITS IS DAYLIGHT

- Sky Cover is most unusual when the combinations of Month and Is Daylight are 5 and TRUE, 6 and TRUE, 2 and TRUE, 10 and FALSE, 6 and FALSE and more.
- Sky Cover is most unusual in 9, 10 and 2.
- Based on the current forecasting, Sky Cover may reach 968.3 by Month 15.



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