PROJECT DEVELOPMENT – OPTIMIZING ENERGY DEMAND AND CONSUMPTION THROUGH DATA-DRIVEN STRATEGIES

A.V.C COLLEGE OF ENGINEERING,

MANNAMPANDAL.

COLLEGE CODE: 8203

COLLEGE NAME: A.V.C COLLEGE OF ENGINEERING

TECHNOLOGY: DATA ANALYTICS

TOTAL NO. OF STUDENTS IN A GROUP: 5

TEAM NAME: "TECH TITANS**"**

TEAM MEMBERS:

1. B. AZRINA (REG NO:820322205013)
2. V. SAHANA (REG NO:820322205035)
3. M. FIRNAS (REG NO:820322205017)
4. N. SYED ADIL (REG NO:820322205049)
5. S. MOHAMED SHALMANSHA (REG NO:820322205026)

SUBMITTED BY,

B.AZIRNA

NM ID: aut820322it052

DASHBOARD CREATION:

LINKS:

- ✓ **INTRO_PAGE:**
  https://us1.ca.analytics.ibm.com/bi/?perspective=dashboard&pathRef=.my_folders%@FMY&action=view&mode=dashboard&subView=model0000018f8ce421ce_00000000

- ✓ **DAY_OF_THE_WEEK:**
  https://us1.ca.analytics.ibm.com/bi/?perspective=dashboard&pathRef=.my_folders%@FMY&action=view&mode=dashboard&subView=model0000018f8f5942f4_00000000

- ✓ **TIME_OF_THE_DAY:**
  https://us1.ca.analytics.ibm.com/bi/?perspective=dashboard&pathRef=.my_folders%@FMY&action=view&mode=dashboard&subView=model0000018f8f788389_00000000

- ✓ **EXTERNAL_FACTOR:**
  https://us1.ca.analytics.ibm.com/bi/?perspective=dashboard&pathRef=.my_folders%@FMY&action=view&mode=dashboard&subView=model0000018f8fb2319b_00000000

DASHBOARD SCREENSHOT & ANALYSIS:

INTRO PAGE SCREENSHOT:

IoT Sensor Data:

- Day of Week 1 has the lowest total IoT Sensor Data at 233.63, followed by 4 at 236.71.
- Day of Week 3 has the highest total IoT Sensor Data at 247.27, followed by 0 at 246.94.
- Based on the current forecasting, IoT Sensor Data may reach 236.6 by Day of Week 8.
- The overall number of results for IoT Sensor Data is almost 3500.

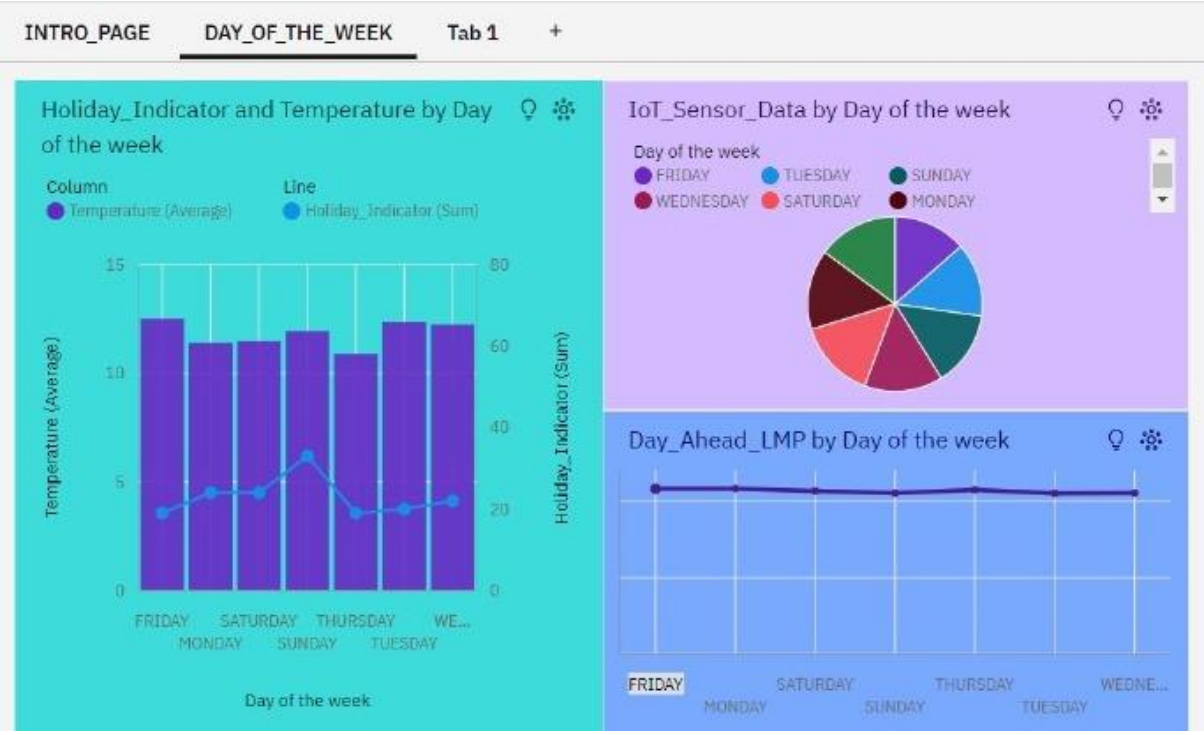
Day Ahead Demand:

- Day_of_Week 4 has the lowest total Day_Ahead_Demand at over 353 thousand, followed by 5 at almost 354 thousand.
- Day_of_Week 3 has the highest total Day_Ahead_Demand at over 357 thousand, followed by 2 at nearly 357 thousand.
- Based on the current forecasting, Day_Ahead_Demand may reach nearly 355 thousand by Day_of_Week 8.
- The overall number of results for Day_Ahead_Demand is almost 3500.

Electricity Load:

- Day_of_Week 0 has the lowest total Electricity_Load at over 346 thousand, followed by 2 at over 351 thousand.
- Day_of_Week 3 has the highest total Electricity_Load at over 359 thousand, followed by 1 at over 357 thousand.
- Based on the current forecasting, Electricity_Load may reach nearly 359 thousand by Day_of_Week 8.
- The overall number of results for Electricity_Load is almost 3500.

DAY OF THE WEEK SCREENSHOT:



Holiday Indicator and Temperature:

- Day of the week FRIDAY has the highest Average Temperature but is ranked #6 in Average Humidity.
- Day of the week TUESDAY has the highest Average Humidity but is ranked #2 in Average Temperature.
- Overall day of the weeks, the average of Temperature is 11.83.
- The average values of Temperature range from 10.88, occurring when Day of the week is THURSDAY, to 12.5, when Day of the week is FRIDAY.
- Day of the week FRIDAY has the highest Average Temperature but is ranked #6 in Total Holiday Indicator.
- Overall day of the weeks, the sum of Holiday Indicator is 161.

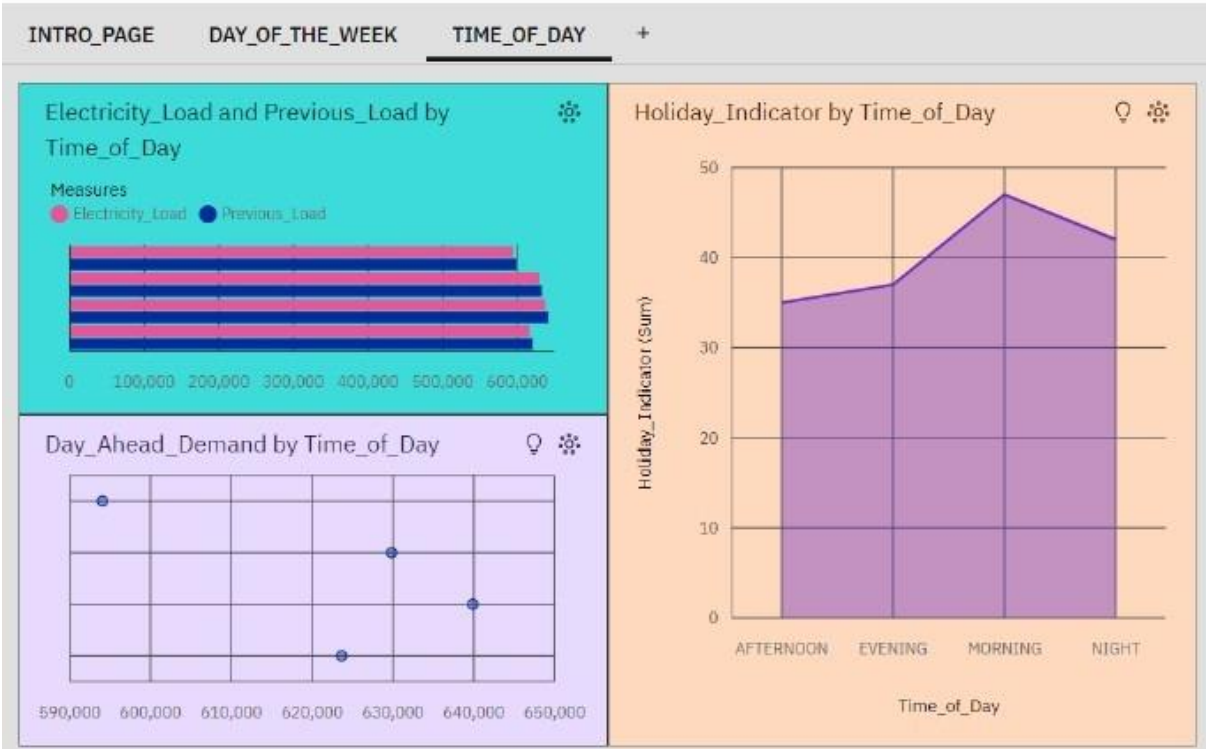
IoT Sensor Data:

- Day of the week THURSDAY has the highest Total IoT_Sensor_Data but is ranked #7 in Average Humidity.
- Day of the week TUESDAY has the highest Average Humidity but is ranked #6 in Total IoT_Sensor_Data.
- Overall day of the weeks, the average of IoT_Sensor_Data is 0.5097.
- The total number of results for IoT_Sensor_Data, across all day of the weeks, is almost 3500.

Day Ahead LMP:

- Day of the week TUESDAY has the highest Average Humidity but is ranked #7 in Total Day_Ahead_LMP.
- Day of the week MONDAY has the highest Total Day_Ahead_LMP but is ranked #5 in Average Humidity.
- Day_Ahead_LMP ranges from over 21 thousand, when Day of the week is TUESDAY, to almost 22 thousand, when Day of the week is MONDAY.

<u>TIME_OF_THE_DAY SCREENSHOT:</u>



Holiday Indicator:

- Time_of_Day MORNING has the highest values of both Holiday Indicator and Temperature.
- Holiday Indicator ranges from 35, when Time_of_Day is AFTERNOON, to 47, when Time_of_Day is MORNING.
- For Holiday Indicator, the most significant values of Time_of_Day are MORNING and NIGHT, whose respective Holiday Indicator values add up to 89, or 55.3 % of the total.
- Over all values of Time_of_Day, the sum of Holiday Indicator is 161

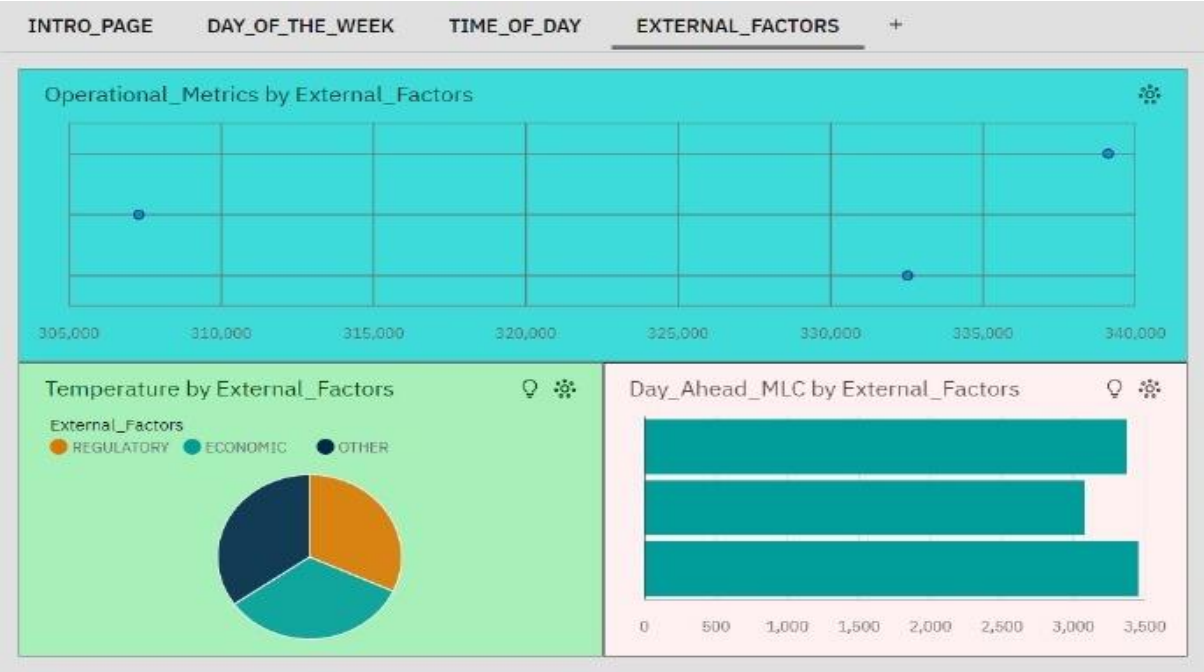
Day Ahead Demand:

- Time_of_Day AFTERNOON has the highest Average Humidity but is ranked #4 in Total Day_Ahead_Demand.
- Time_of_Day MORNING has the highest Total Day_Ahead_Demand but is ranked #4 in Average Humidity.
- The total number of results for Day_Ahead_Demand, across all Day_Ahead_Demand, is 4.
- The total number of results for Time_of_Day, across all Day_Ahead_Demand, is 4.

Electricity Load and Previous Load:

- Time_of_Day MORNING has the highest values of both Electricity_Load and Previous Load.
- Over all values of Time_of_Day, the average of Electricity_Load is 747.1.
- Over all values of Time_of_Day, the average of Previous Load is 751.7.
- The total number of results for Electricity Load, Previous Load across all Time_of_Day, is almost 3500.

EXTERNAL FACTORS SCREENSHOT:



Operational Metrics:

- External Factors ECONOMIC has the highest values of both Operational Metrics and Humidity.
- The total number of results for External Factors, across all Operational Metrics, is 3.
- The total number of results for Operational Metrics, across all Operational Metrics, is 3.

Temperature:

- External Factors OTHER has the highest Average Temperature but is ranked #3 in Average Humidity.
- External Factors ECONOMIC has the highest Average Humidity but is ranked #2 in Average Temperature.
- REGULATORY (34.3 %) and ECONOMIC (34.2 %) are the most frequently occurring categories of External Factors with a combined count of 2,272 items with Temperature values (68.5 % of the total).
- Over all values of External Factors, the average of Temperature is 11.83.

- The average values of Temperature range from 11.31, occurring when External Factors is REGULATORY, to 12.33, when External Factors is OTHER.

Day Ahead MLC:

- Day_Ahead_MLC is unusually low when External Factors is OTHER.
- External Factors ECONOMIC has the highest Average Humidity but is ranked #2 in Total Day_Ahead_MLC.
- External Factors REGULATORY has the highest Total Day_Ahead_MLC but is ranked #2 in Average Humidity.
- Day_Ahead_MLC ranges from over three thousand, when External Factors is OTHER, to almost 3500, when External Factors is REGULATORY.

CONCLUSION:

In conclusion, the adoption of data-driven strategies for optimizing energy demand and consumption is a strategic necessity for organizations aiming for sustainability and efficiency. The insights provided by our dashboard demonstrate the transformative potential of data in driving smarter, more sustainable energy practices. Continuous innovation and investment in data analytics will be crucial for sustaining and enhancing these benefits, ensuring a resilient and energy-efficient future.