Tech Saksham
Case Study Report

Data Analytics with Power BI

"Analysis of Commercial Electricity Consumption in Indian state"

"A.P.C. Mahalaxmi College For Women"

NM ID	NAME
23C5CDC801742AB95DC48DCD384AC24A	KARPAGAVALLI K

Trainer Name : R UMAMAHESWARI

Master Trainer : R UMAMAHESWARI

ABSTRACT

Energy has been universally recognized as one of the most important input for economic growth and human development. Generally, it has defined as "Capacity to do work" thereby, for bring out desirable design on economic level there must be need of intensive of energy performance in various sectors of the country. Perceiving commercial energy at the one of economic viability consumption has equip the present status of economic level to be boost and reach global advance in due period with identification of which are highly consumes among public and the statistics of this has brought out in this study. Electricity, LPG, kerosene, coal and natural gas are the chosen commercial energy and data for the specified years have collected from central electricity authority CAE and Energy statistics 2015 for 2007-2014.

INDEX

CHAPTER 1

INTRODUCTION

12.1 Problem statement

Energy is an integral part of today's modern life. It has become the blood of our day to day life. But it is not free. It comes at a monetary price but more than that it comes at environment cost too. Every farming activity and agricultural allied undertakings need a specific amount of energy to undertake the process and operations. It could be in the form of electrical energy, thermal energy or any other forms of energy use. During good old days, when energy was in surplus, no one cared about designing the system to minimize the energy use. In addition to this, designers used to take huge safety margins on one side and extra precaution on initial capital investment on the other, which also led to extra amount of energy consumption to undertake a specific task. However, the situation has changed now dramatically and survival becomes a question mark in front of most of the farmers that those days enjoying a very comfortable position earlier. Under such a scenario, effective energy management strategy is the only option for survival. To cut price, the cost of production needs to be reduced. The energy cost is 5 to25% or even more in Indian agriculture. Hence the present study is to attempt sustainability of development of Human Development Index through

12.2 Proposed Solution

The proposed solution is to develop a PowerBI dashboard that can analyze and visualize real-time customer data. The dashboard will integrate data from various sources such as transaction history, customer feedback, and demographic data. It will provide a comprehensive view of customer behavior, preferences, and trends, enabling banks to make informed decisions. The dashboard will be interactive, user-friendly, and customizable, allowing banks to tailor it to their specific needs. The real-time analysis capability of the dashboard will enable banks to respond

promptly to changes in customer behavior or preferences, identify opportunities for cross-selling and up-selling, and tailor their products and services to meet customer needs.

12.3 Feature

- **Real-Time Analysis**: The dashboard will provide real-time analysis of electricity consumption.
- **Export and sharing options**: Provide functionality to export analysis results in various formats.
- **Trend Analysis**: The dashboard will identify and display trends..
  Predictive Analysis: It will use historical data to predict future.

12.4 Advantages

- **Data-Driven Decisions**: Electricity can make informed decisions based on real-time data analysis.
- **Improved Customer Engagement**: Understanding customer behavior and trends can help save electricity
.

12.5 Scope

Creative ideas towards the specified disputes are must not keep it prolong or manage instead giving appropriate solution for remedies. Therefore, this study also contributing some solutions for existing problem pertained to over commercial energy consumption in India
 1. Generation of awareness among public to consume commercial energy less to prevent utilization of primary energy as inputs.
 2. Policy requires to ensure towards keep sustainable development on energy consumption.
 3. Government should be regulate the production of commercial energy if it affect the economic growth.
 4. Price and imports of commercial energy should be regulate
. 5. Aware of efficient energy consumption have to proclaim.
 6. Evaluate the problems of primary energy consumers due to spread of commercial energy.
 7. Problems of over consumption of commercial energy leads worsen to nation that be proclaim.

CHAPTER 2

SERVICES AND TOOLS REQUIRED

2.1 Services Used

- **Data Processing Services**: Services like Azure Stream Analytics or AWS Kinesis Data Analytics can be used to process the real-time data.

- **Machine Learning Services**: Azure Machine Learning or AWS Sage Maker can be used to build predictive models based on historical data.

2.2 Tools and Software used

Tools:

Power BI: The main tool for this project is Power BI, which will be used to create interactive dashboards for real-time data visualization.

Software Requirements:

- **PowerBI Desktop**: This is a Windows application that you can use to create reports and publish them to PowerBI.
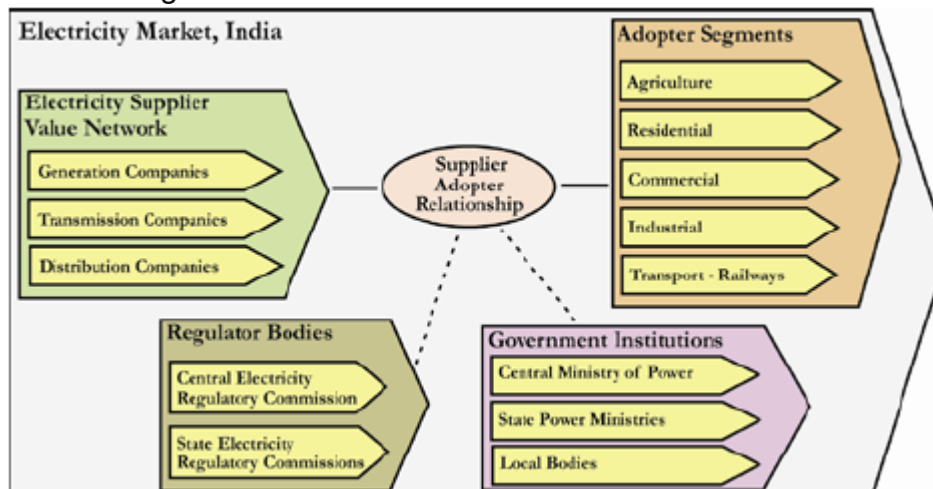
CHAPTER 3

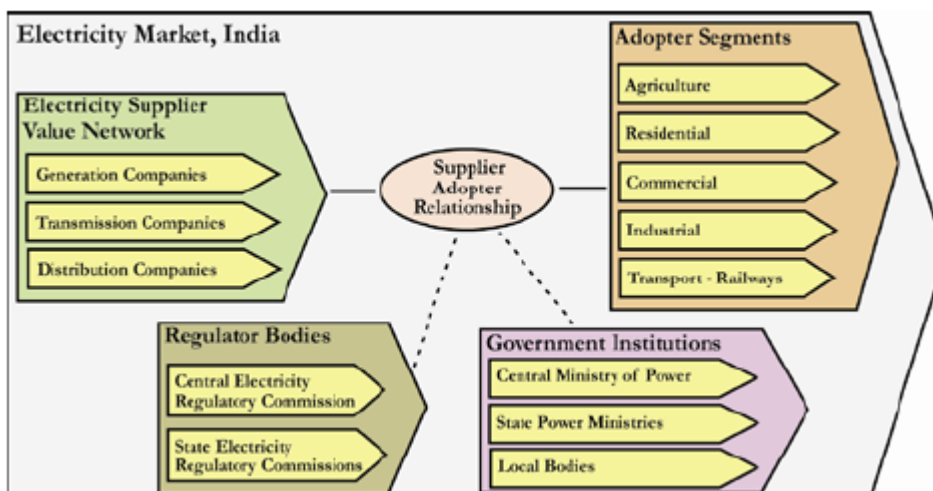# PROJECT ARCHITECTURE

3.1 Architecture

Here's a high-level arch itecture for the project:

Electricity Market, India

Electricity Supplier Value Network
- Generation Companies
- Transmission Companies
- Distribution Companies

Supplier Adopter Relationship

Adopter Segments
- Agriculture
- Residential
- Commercial
- Industrial
- Transport - Railways

Regulator Bodies
- Central Electricity Regulatory Commission
- State Electricity Regulatory Commissions

Government Institutions
- Central Ministry of Power
- State Power Ministries
- Local Bodies

CHAPTER 4

MODELING AND RESULT

Manage relationship

Managing relationships for analyzing commercial electricity consumption in Indian states involves coordinating with various stakeholders and ensuring effective communication and collaboration. Here's how you can manage these relationships:

Create relationship

Select tables and columns that are related.

1_data ▾

Column1	Punjab	Haryana	Rajasthan	Delhi	UP	Uttarakhand	HP	J&K	Chandigarh
03-01-2019 00:00:00	121.9	133.5	240.2	85.5	311.8	39.3	30.1	54.1	
04-01-2019 00:00:00	118.8	128.2	239.8	83.5	320.7	38.1	30.1	53.2	
05-01-2019 00:00:00	121	127.5	239.1	79.2	299	39.2	30.2	51.5	

‹   ›

2_data ▾

States	Regions	latitude	longitude	Dates	Usage
UP	NR	27.59998069	78.05000565	02-01-2019 00:00:00	313.9
UP	NR	27.59998069	78.05000565	03-01-2019 00:00:00	311.8
UP	NR	27.59998069	78.05000565	04-01-2019 00:00:00	320.7

Cardinality

[_____ ▾]

Cross filter direction

[_____ ▾]

☐ Make this relationship active

☐ Apply security filter in both directions

☐ Assume referential integrity

Navigator

Display Options ▾

▲ 📁 whole dataset.xlsx [2]

☑ ▦ 1_data

☐ ▦ 2_data

1_data

Preview downloaded on Monday

Column1	Punjab	Haryana	Rajasthan	Delhi	UP
02-01-2019 00:00:00	119.9	130.5	234.1	85.8	313.5
03-01-2019 00:00:00	121.9	133.5	240.2	85.5	311.1
04-01-2019 00:00:00	118.8	128.2	239.8	83.5	320.1
05-01-2019 00:00:00	121	127.5	239.1	79.2	291
06-01-2019 00:00:00	121.4	132.6	240.4	76.6	286.1
07-01-2019 00:00:00	118	132.1	241.9	71.1	294.1
08-01-2019 00:00:00	107.5	121.4	237.2	69	289.4
09-01-2019 00:00:00	132.5	148.2	197	89.2	258.6
10-01-2019 00:00:00	131.5	157	199.9	92.8	284.1
11-01-2019 00:00:00	130.3	145.3	187.7	79.5	281.4
12-01-2019 00:00:00	137.9	151.9	189.9	92.6	298.6
13-01-2019 00:00:00	135.8	141.4	186.9	89.4	310
14-01-2019 00:00:00	139.3	143.8	195.2	82.2	319.5
15-01-2019 00:00:00	141.1	142.9	185.4	77.8	326.1

ⓘ The data in the preview has been truncated due to size limits.

Display Options *

▲ 📁 whole dataset.xlsx [2]
  ☐ 📋 1_data
  ☑ 📋 2_data

2_data

Preview downloaded on Monday

States	Regions	latitude	longitude	Dates
Punjab	NR	31.51997398	75.98000281	02-01-201:
Haryana	NR	28.45000633	77.01999101	02-01-201:
Rajasthan	NR	26.44999921	74.63998124	02-01-201:
Delhi	NR	28.6699929	77.23000403	02-01-201:
UP	NR	27.59998069	78.05000565	02-01-201:
Uttarakhand	NR	30.32040895	78.05000565	02-01-201:
HP	NR	31.10002545	77.16659704	02-01-201:
J&K	NR	33.45	76.24	02-01-201:
Chandigarh	NR	30.71999697	76.78000565	02-01-201:
Chhattisgarh	WR	22.09042035	82.15998734	02-01-201:
Gujarat	WR	22.2587	71.1924	02-01-201:
MP	WR	21.30039105	76.13001949	02-01-201:
Maharashtra	WR	19.25023195	73.16017493	02-01-201:
Goa	WR	15.491997	73.81800065	02-01-201:
DNH	WR	20.26657819	73.0166178	02-01-201:
Andhra Pradesh	SR	14.7504291	78.57002559	02-01-201:
Telangana	SR	18.1124	79.0193	02-01-201:
Karnataka	SR	12.57038129	76.91999711	02-01-201:
Kerala	SR	8.900372741	76.56999263	02-01-201:
Tamil Nadu	SR	12.92038576	79.15004187	02-01-201:
Pondy	SR	11.93499371	79.83000037	02-01-201:
Bihar	ER	25.78541445	87.4799727	02-01-201:

Dashboard

Sum of Usage by States and Regions

Sum of Usage by Regions, latitude and longitude
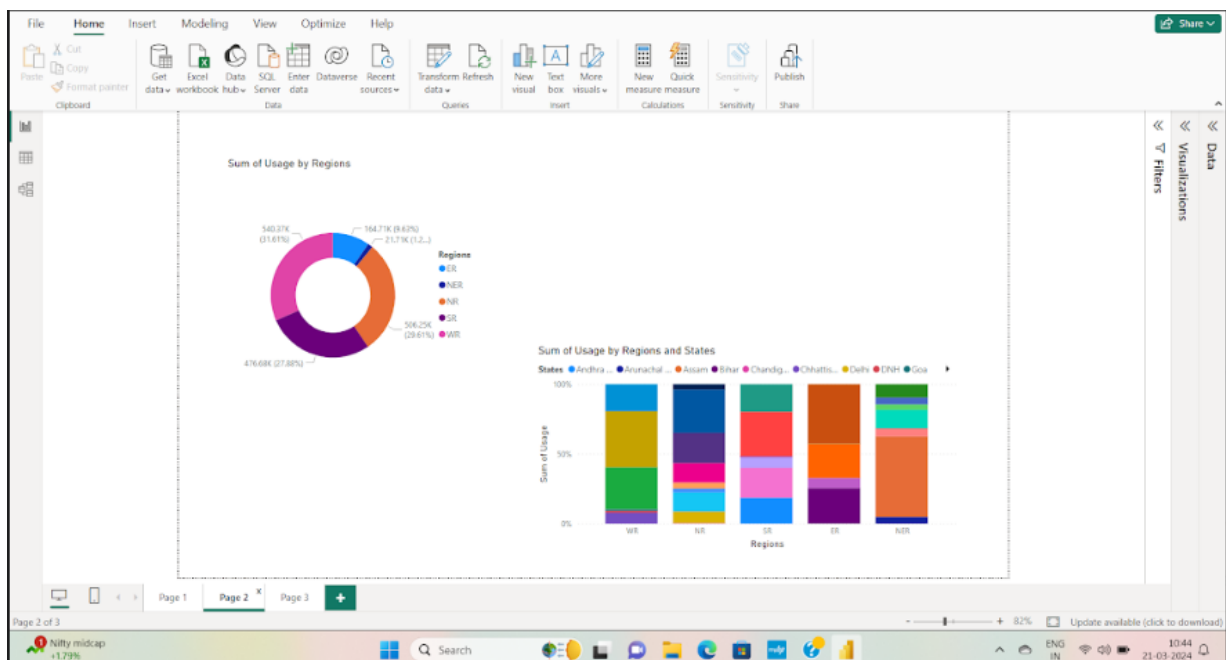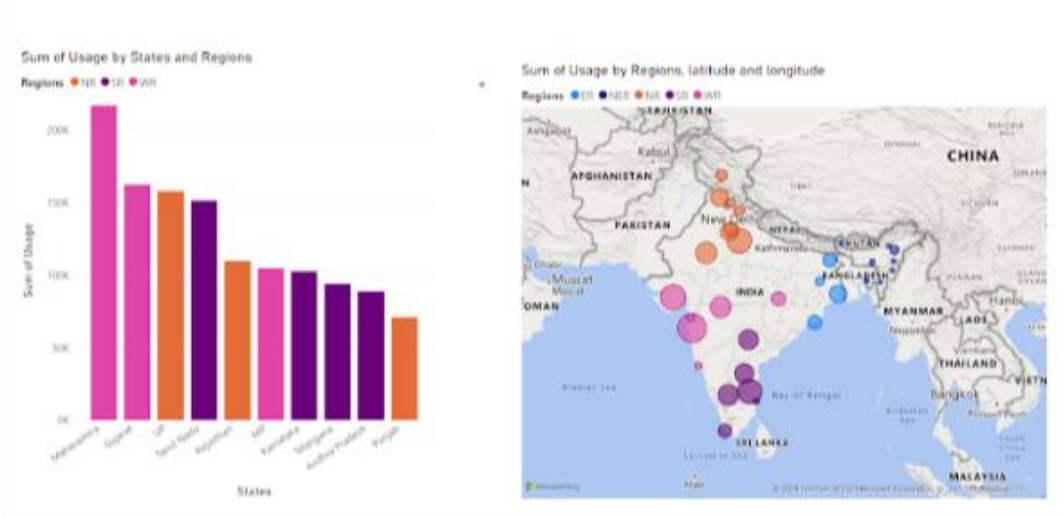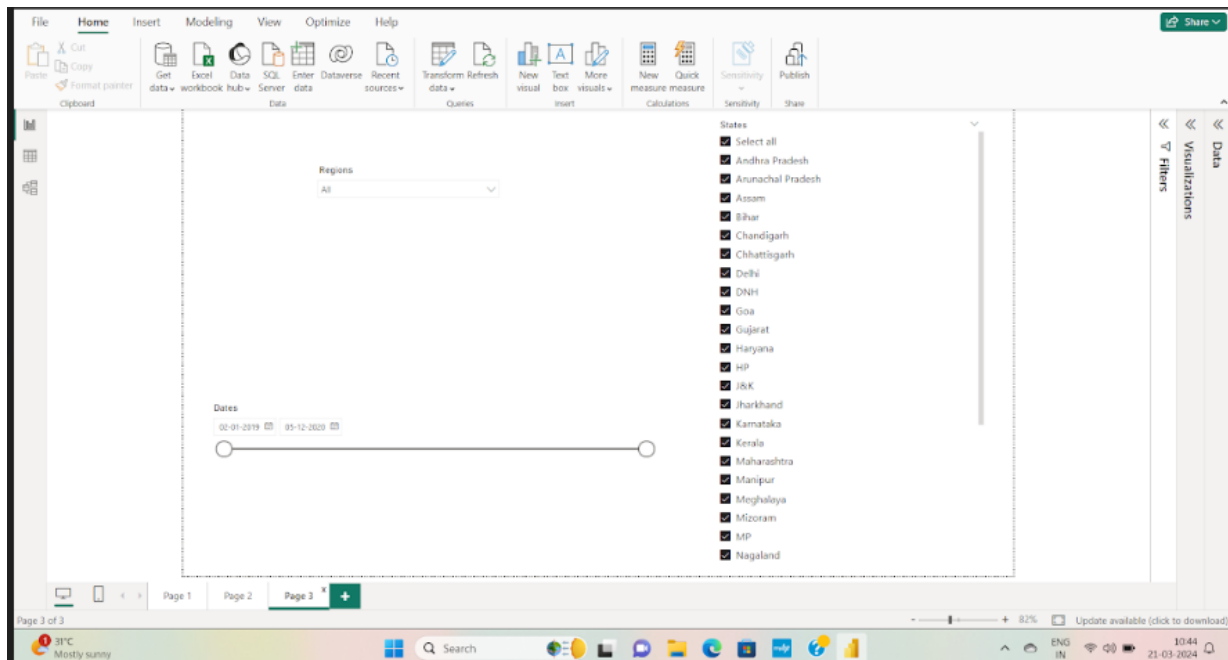
CONCLUSION

The project "Analysis of commercial electricity consumption in Indian states" using PowerBI has successfully demonstrated the potential of data analytics in electrical consumption. The present study has described pertaining to energy consumption in the aspect of classified commercial type energy with the reference of India's different sectorial energy consumption. Energy conditions of the country with past data promoted us to analysis present and future requires of energy also used. Examines of commercial energies and it's affections among the people entitled here specifically and subsequently, consumption and demand

pattern of energy with the causes of variations also included. Mainly, the causes for dynamic changes on energy consumption from non-commercial to commercial energy also engraved for the findings of present existing scarce in renewable sources for resolve it. The use of PowerBI has made it possible to present data in a visually appealing and easy-to-understand format, thereby aiding in better decision-making.

FUTURE SCOPE

The future scope of this project is vast. With the advent of advanced analytics and machine learning, PowerBI can be leveraged to predict future trends based on historical data. Implement real-time monitoring systems using smart meters and lo T devices. Enhance data collection accuracy and granularity for better decision-making .focus on energy-efficient practices in commercial buildings and industries .conduct regular energy audits and recommend improvements .develop predictive models for load profiling and demand forecasting .optimize infrastructure planning and manage peak loads effectively .Tailor strategies for different commercial sectors . identify sector-specific challenges and opportunities.

REFERENCES

https://en.m.wikipedia.org/wiki/Electricity_sector_in_India

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