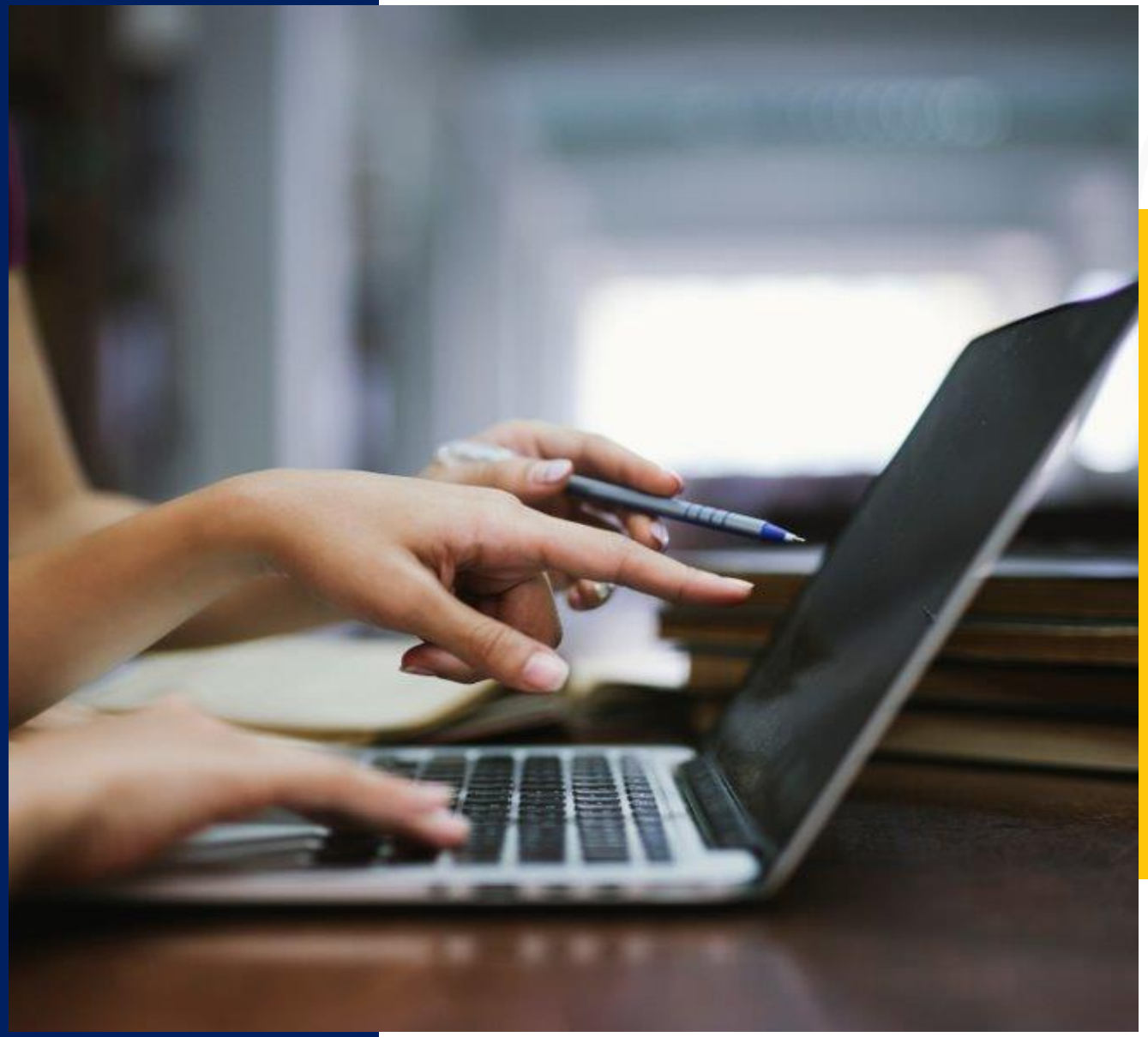

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ENERGY CONSUMPTION PREDICTION

Team ID - 10973

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Under the mentorship of:
Sunil Sumit Sartale

Project Objectives

- Problem Statement
- Project Overview – Introduction
- End Users
- Wow Factor in Project
- Modelling/Block Diagram/Flow of Project
- Result/outcomes
- Conclusion
- Future Perspective

Source

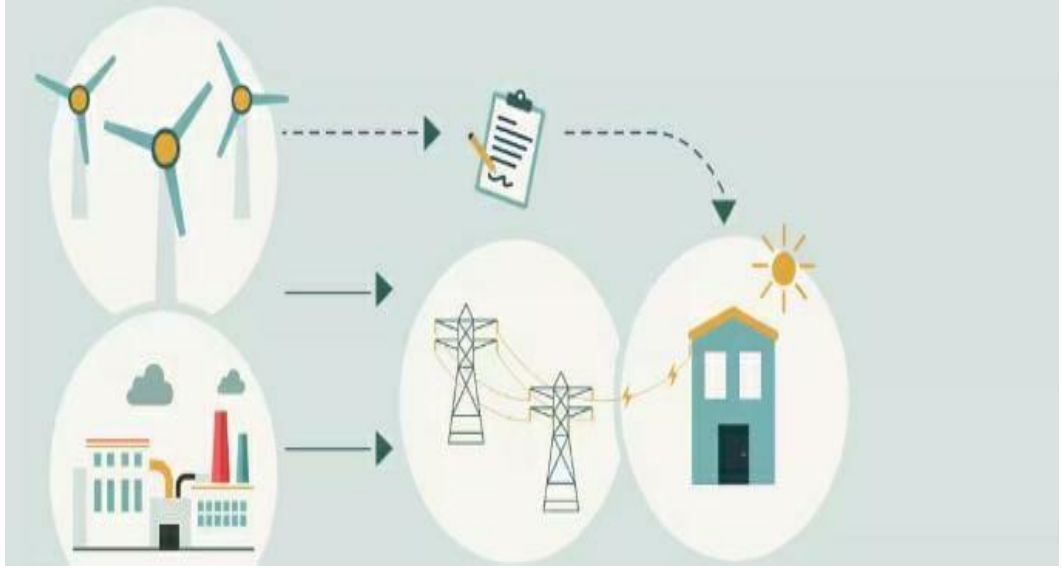
https://www.freepik.com/

Problem Statement

- Energy consumption varies throughout the day due to changes in temperature, human activity, appliances usage, and industrial load.

- The problem is to build a machine learning model that predicts the future energy consumption of a building, home, campus, or city based on historical data and various factors such as time, weather, and load.

- Accurate energy prediction is essential for smart grids and sustainable energy management.



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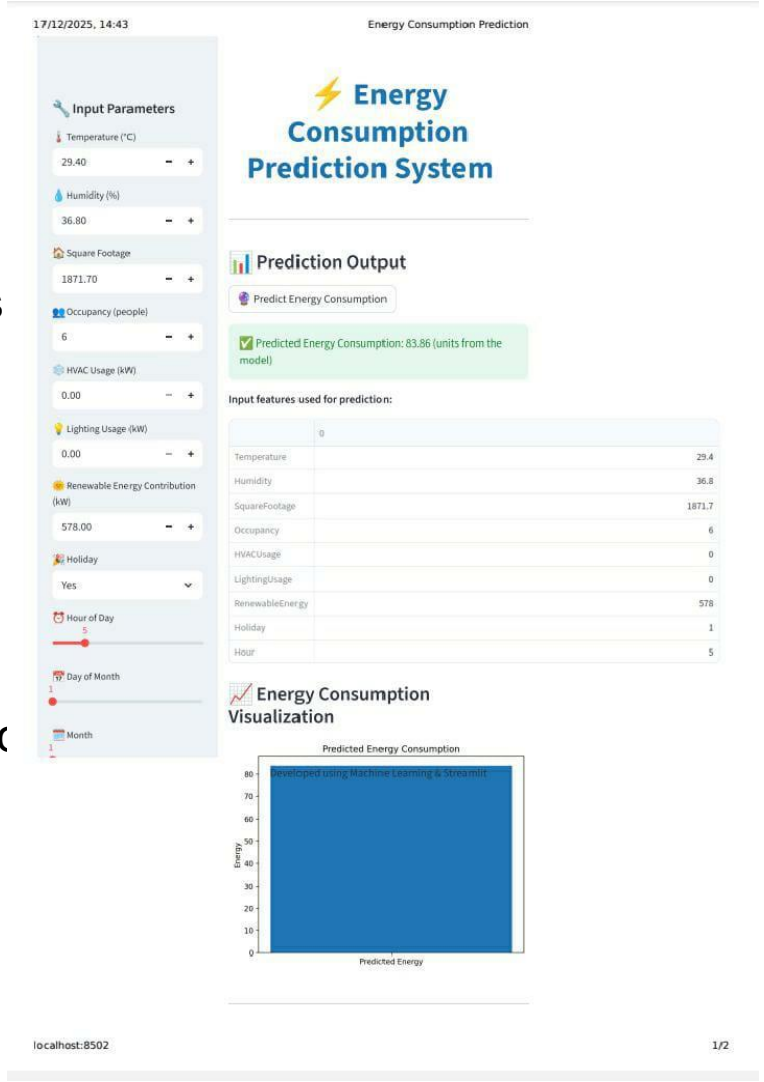
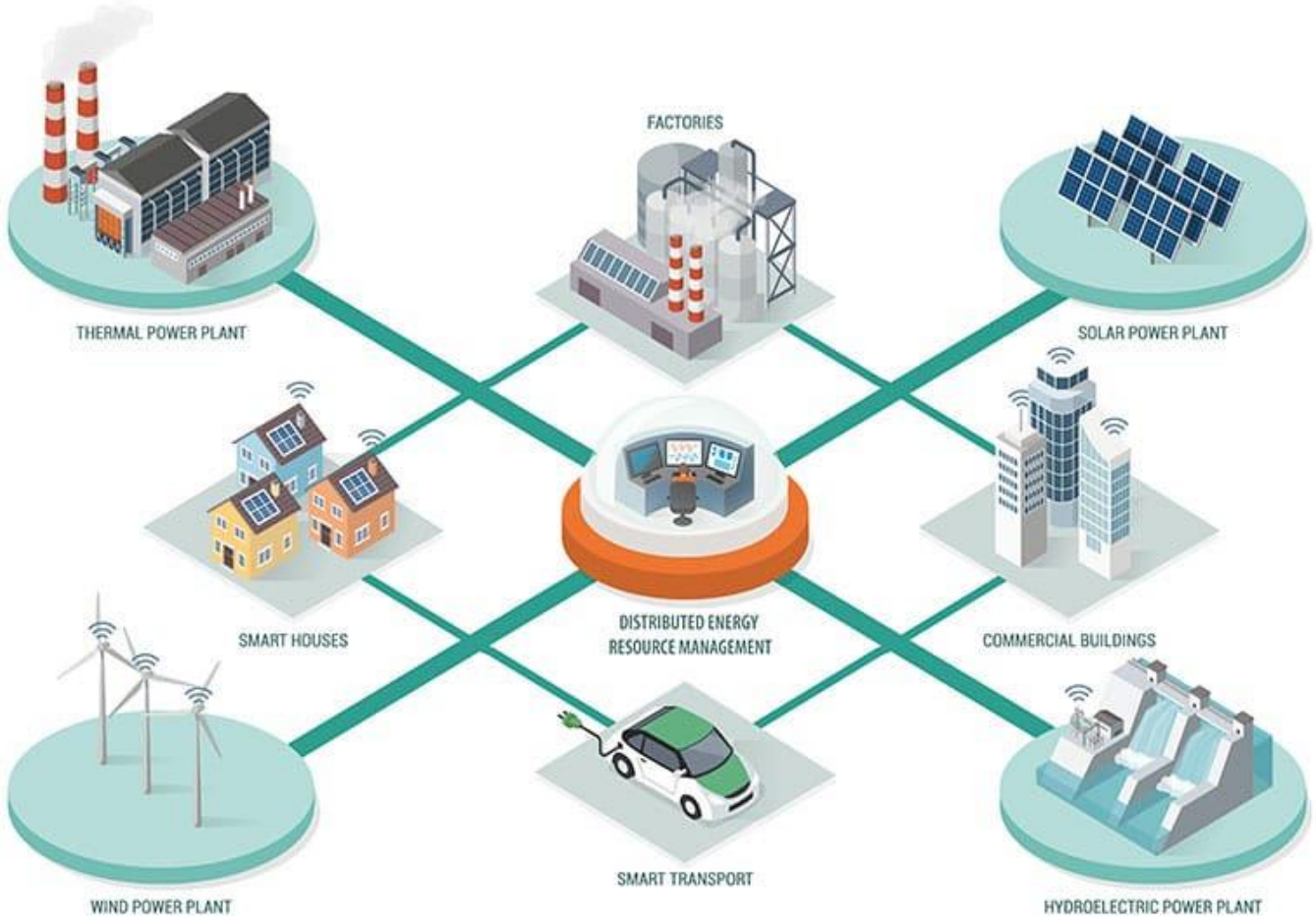
Project overview - Introduction

- Energy consumption prediction refers to forecasting the future energy usage of a system, building, or region.
- Machine learning models help identify hidden patterns and trends energy usage.
- It supports power companies in planning generation, distribution, and load management.
- It helps understand how much energy will be required at a specific time (hourly, daily, weekly, or monthly).
- Overall, energy consumption prediction supports better decision-making, reduces energy waste, and promotes sustainability.



End User

- Householders/Residential Users
- Energy / Power Companies
- Government and Policy Makers
- Utility Management Companies
- Commercial Buildings



Wow factor in Solution

- High-Accuracy ML Model
- Weather-Aware Prediction
- Smart Feature Engineering
- Visual Analytics Dashboard

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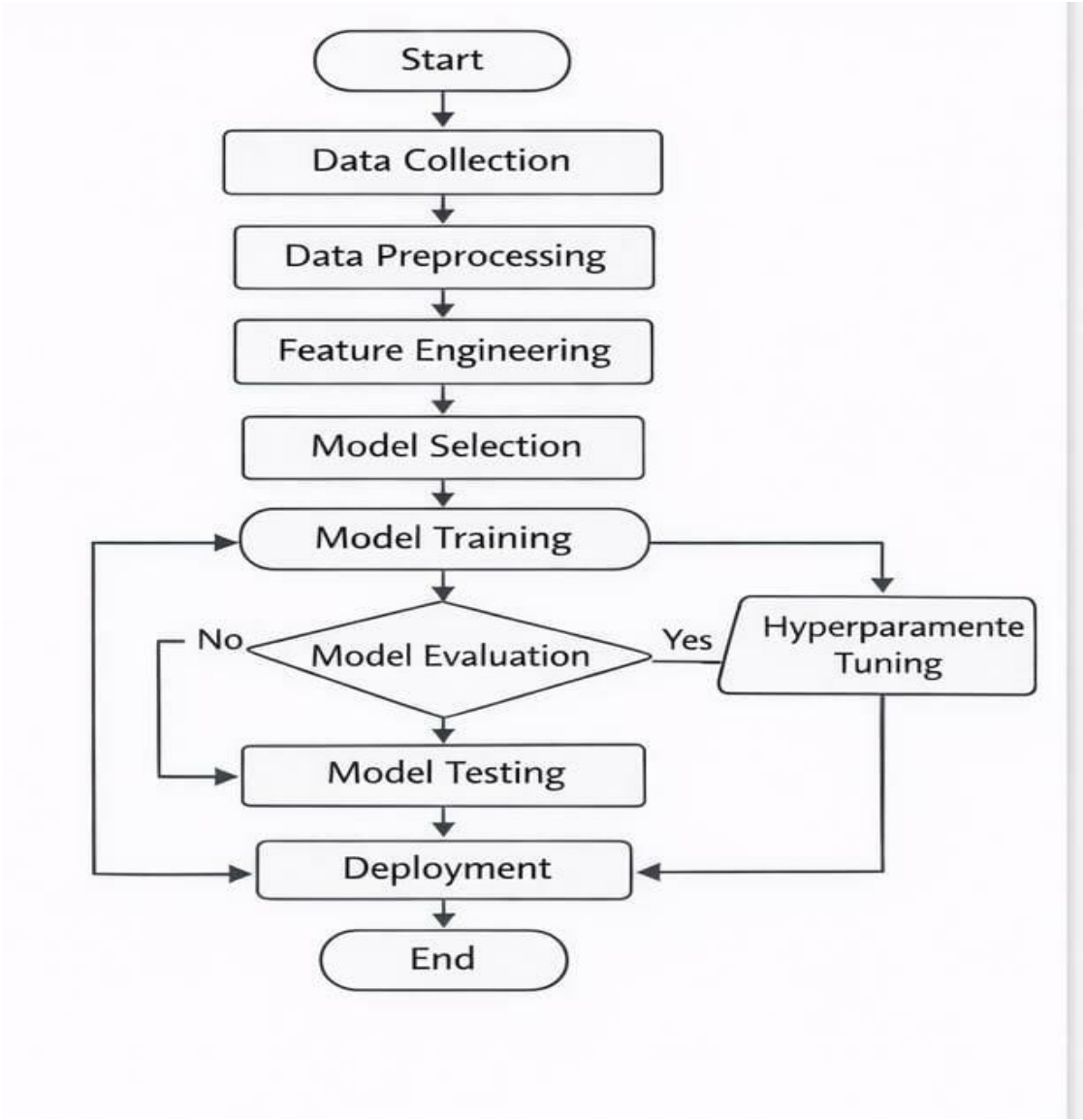
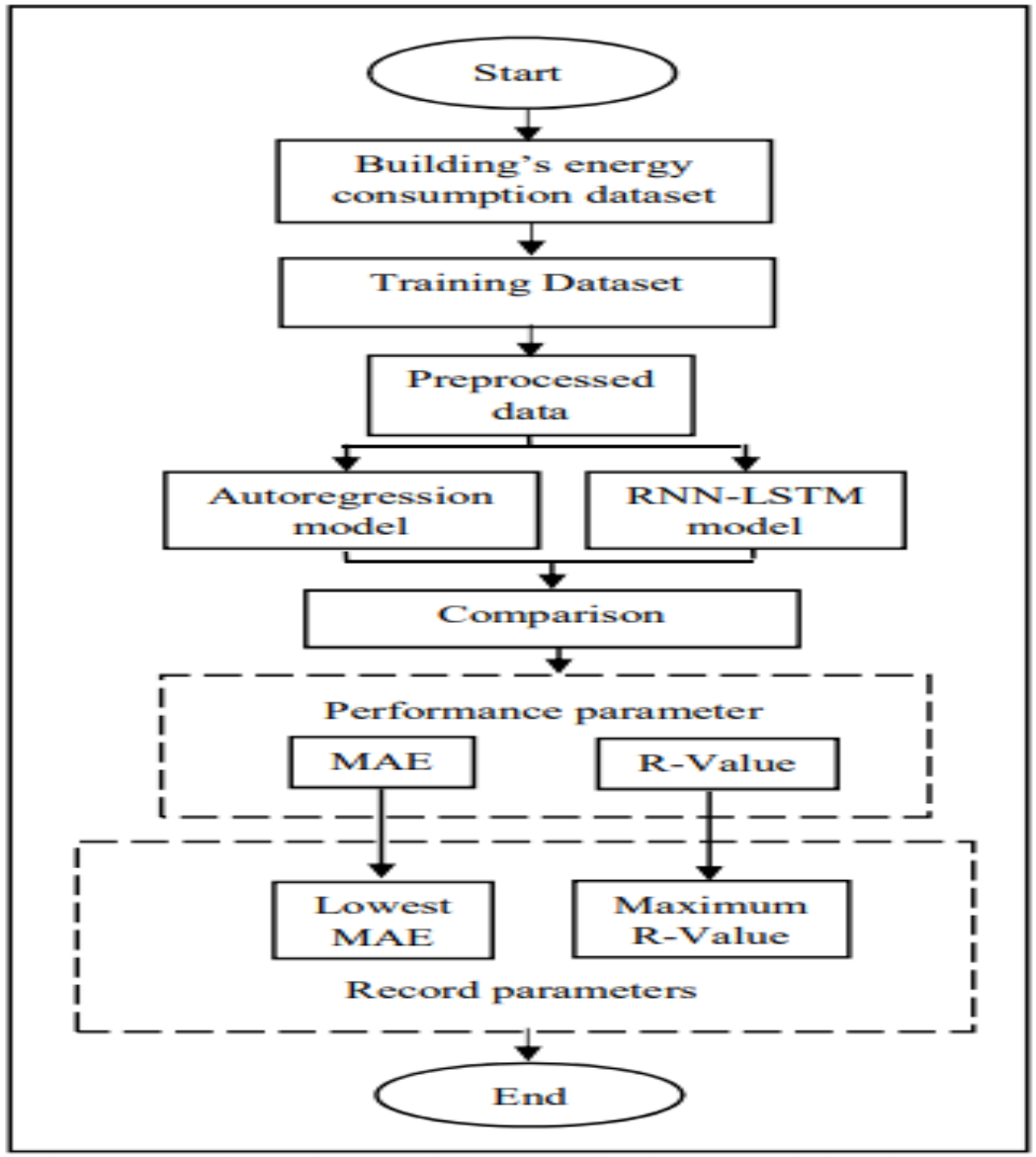
Modelling

Flow Chart



Modelling


Start
Building's energy consumption dataset
Training Dataset
Preprocessed data
Autoregression model
RNN-LSTM model
Comparison
Performance parameter
MAE
R-Value
Lowest MAE
Maximum R-Value
Record parameters
End

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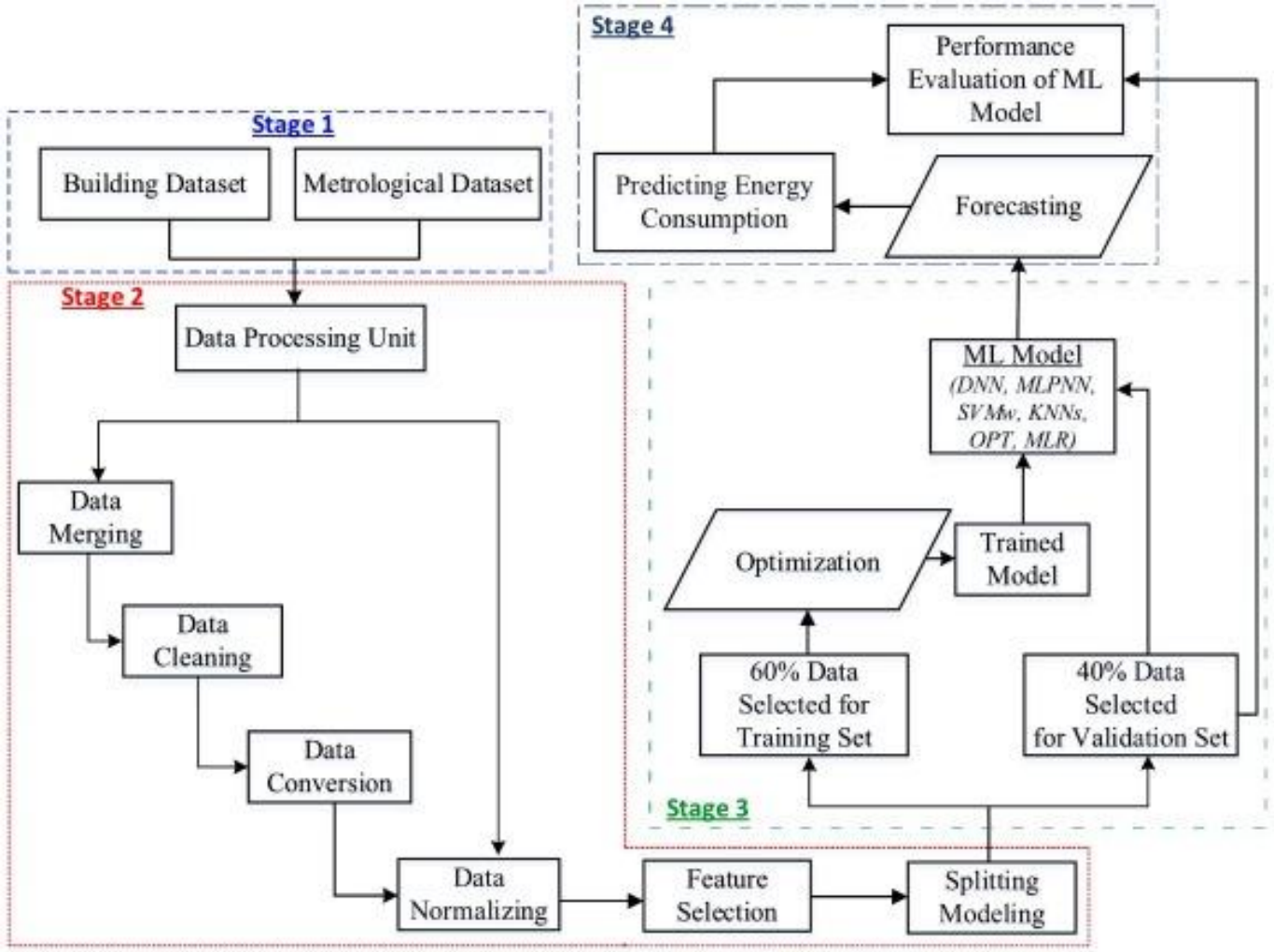
Modelling



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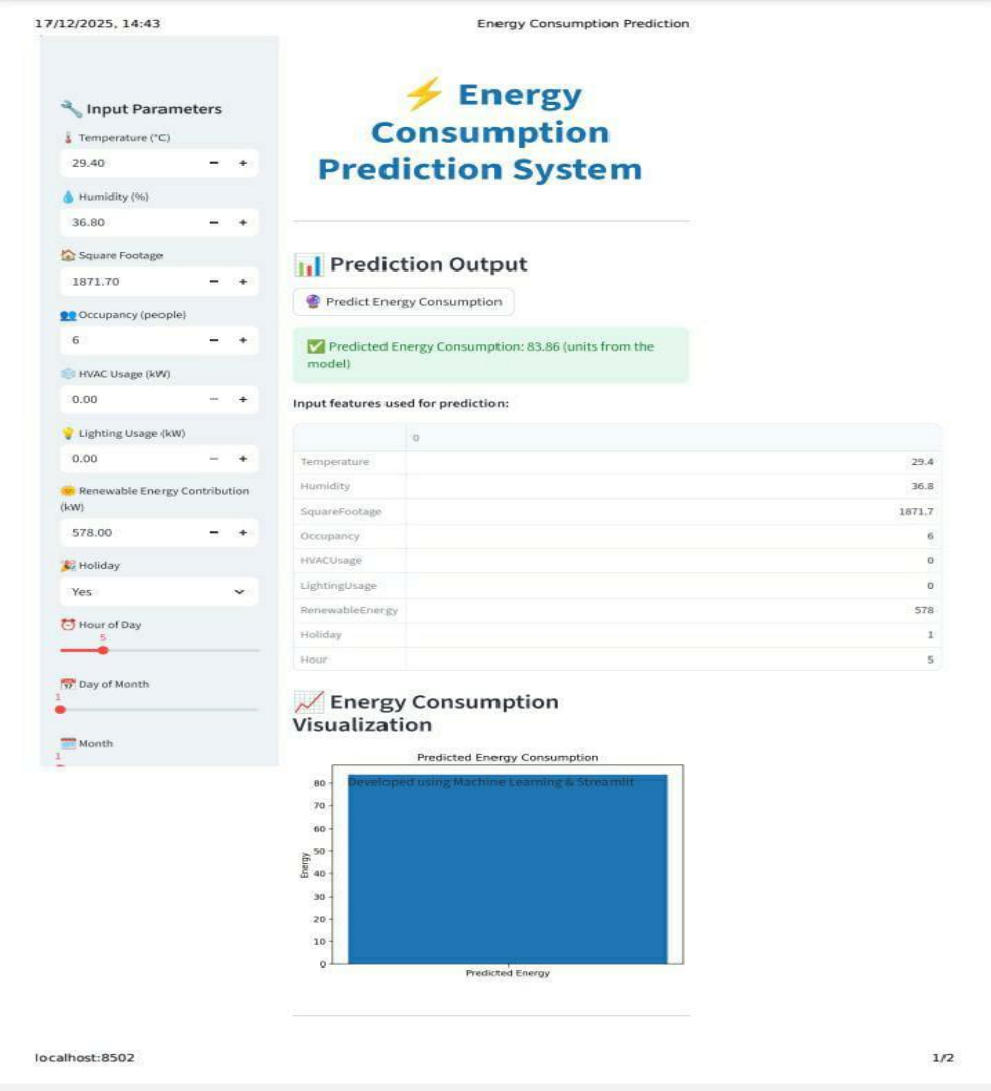
Result / Outcomes



Result Demo-

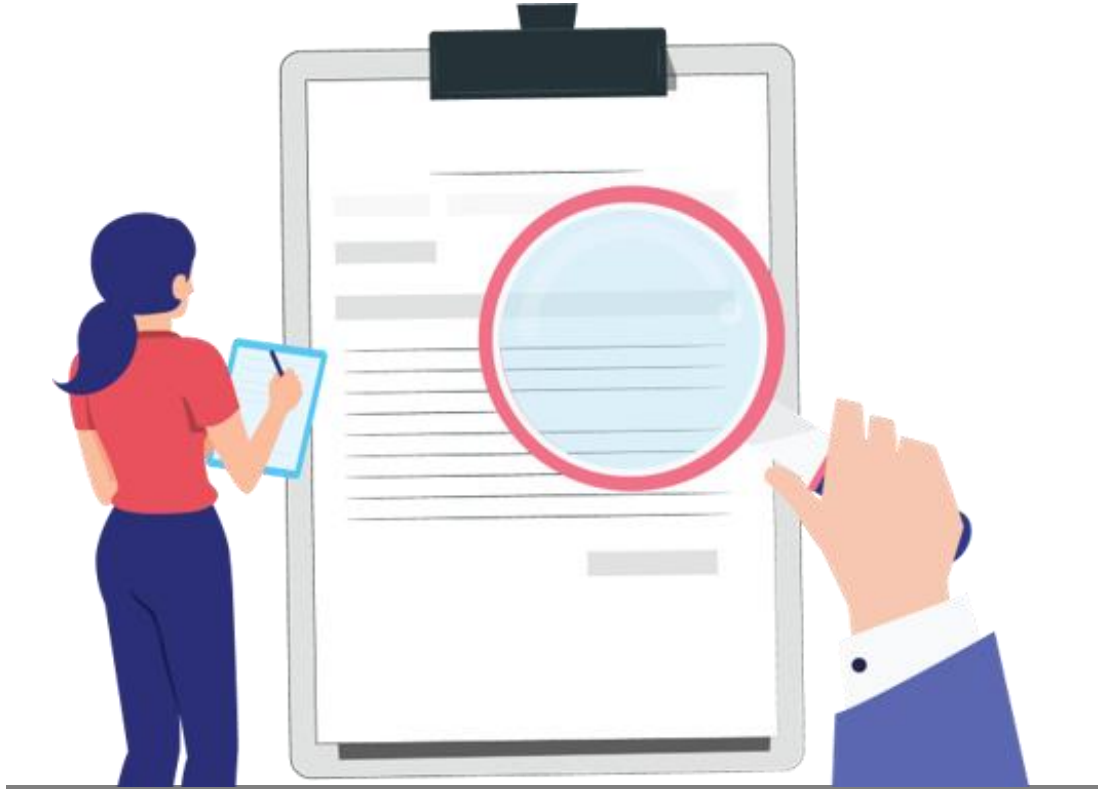
Click Here

Conclusion

- The Energy Consumption Prediction project successfully demonstrates how machine learning can be used to analyze historical usage patterns and accurately forecast future energy demand.

- The final model provides reliable predictions, which can help households, industries, and energy providers make informed decisions.

- Overall, this project highlights the importance of data-driven approaches in optimizing energy usage and contributes toward building smarter, more energy-efficient systems.



Source

https://www.freepik.com/

Future Perspective

1. Integration of Smart Grids

- Future energy systems will use smart meters, IoT sensors, and real-time monitoring to improve prediction accuracy.

2. AI-Driven Accurate Forecasting

- Advanced ML and deep learning models (LSTMs, Transformers) will deliver ultra-accurate predictions.

3. Renewable Energy Optimization

- Solar, wind, and hydro usage will depend heavily on prediction models.

4. Smart Cities Development

- Entire cities will run optimized street lighting, traffic systems, water pumps, and public buildings using predictive analytics.

5. Personalized Energy Management

- “Your consumption will be high tomorrow — adjust usage to save cost.”

Thank You