PRODUCT DEMAND PREDICTION WITH MACHINE

LEARNING

PROJECT TITLE: PRODUCT DEMAND ANALYSIS

PROBLEM STATEMENT:

Create a machine learning model that forecasts product

demand based on historical sales and external factors,

helping businesses optimize inventory management and

production planning to meet customer needs efficiently.

DATASET: Product demand dataset

link:https://www.kaggle.com/datasets/chakradharmattapal

li/product-demand-prediction-with-machine-learning

Project steps:

1.problem definition

2.Design Thinking

: Problem definition:

The problem is to create a machine learning model that

forecasts product demand based on historical sales data and

external factors. The goal is to help businesses optimize

inventory management and production planning to efficiently

meet customer needs. This project involves data collection,

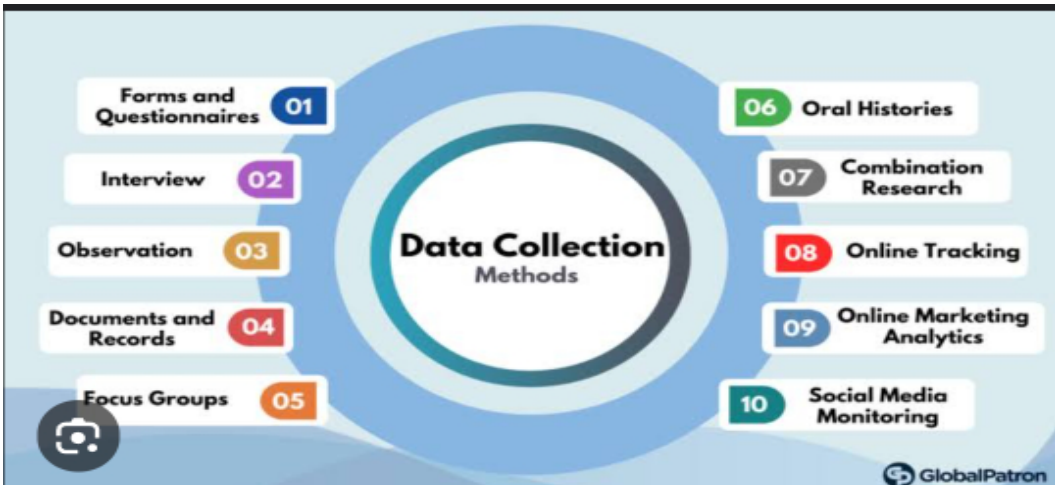
data preprocessing, feature engineering, model selection,

training, and evaluation.

1) Data collection.

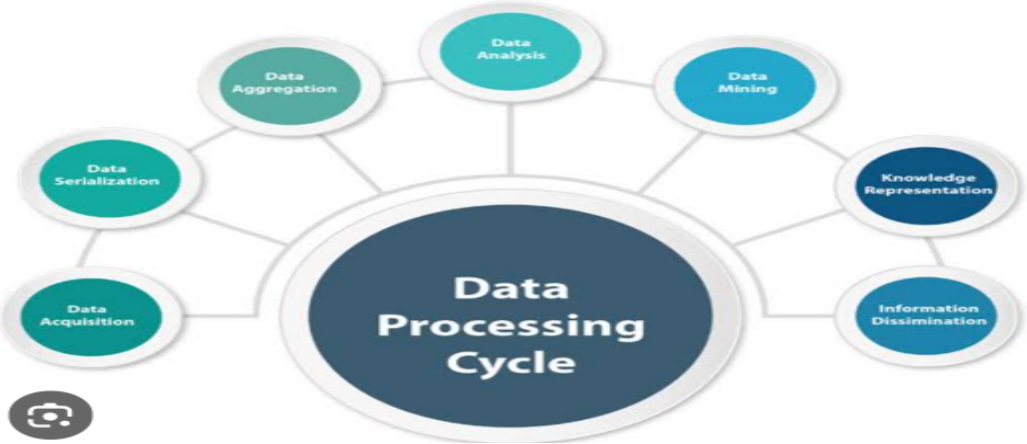
Data collection or data gathering is the process of gathering and measuring information on targeted variables in an established system, which then enables one to answer relevant questions and evaluate outcomes. Data collection is a research component in all study fields, including physical and social sciences, humanities,[2] and business. While methods vary by discipline, the emphasis on

ensuring accurate and honest collection remains the same. The goal for all data collection is to capture evidence that allows data analysis to lead to the formulation of credible answers to the questions that have been posed.



2) data processing.

Data processing occurs when data is collected and translated into usable information. Usually performed by a data scientist or team of data scientists, it is important for data processing to be done correctly as not to negatively affect the end product, or data output.



3) feature engineering

Engineers can create new products and services as technology advances to improve our lives and the world. We can expect more advancements in automation technology through AI and robotics. Engineers can use data to make better decisions and create better solutions. They collaborate with other professionals to create even more innovative solutions.

To learn more about engineering and advance your skills, check out the courses offered by Skill-Lync.

We offer a wide range of courses for engineering

graduates and working professionals to upskill and reskill with the new-age technologies.

Talk with our experts to know more about the courses!

(4).Model Training:

Train the selected model on your training data.

Example:

model.fit(X_train, y_train)(5).Model Training:

Train the selected model on your training data.

Example:

model.fit(X_train, y_train).

5) evaluation.

In common usage, evaluation is a systematic determination and assessment of a subject's merit, worth and significance, using criteria governed by a set of standards. It can assist an organization, program, design, project or any other intervention or initiative to assess any aim, realisable concept/proposal, or any alternative, to help in decision-making; or to generate the degree of achievement or value in regard to the aim and objectives and results of any such action that has been completed.[1]

Ex:

```
from sklearn.metrics import mean_absolute_error
y_pred = model.predict(X_test)

mae = mean_absolute_error(y_test, y_pred)

print(f"Mean Absolute Error: {mae}")y_pred = model.predict(X_test)

mae = mean_absolute_error(y_test, y_pred)

print(f"Mean Absolute Error: {mae}").
```