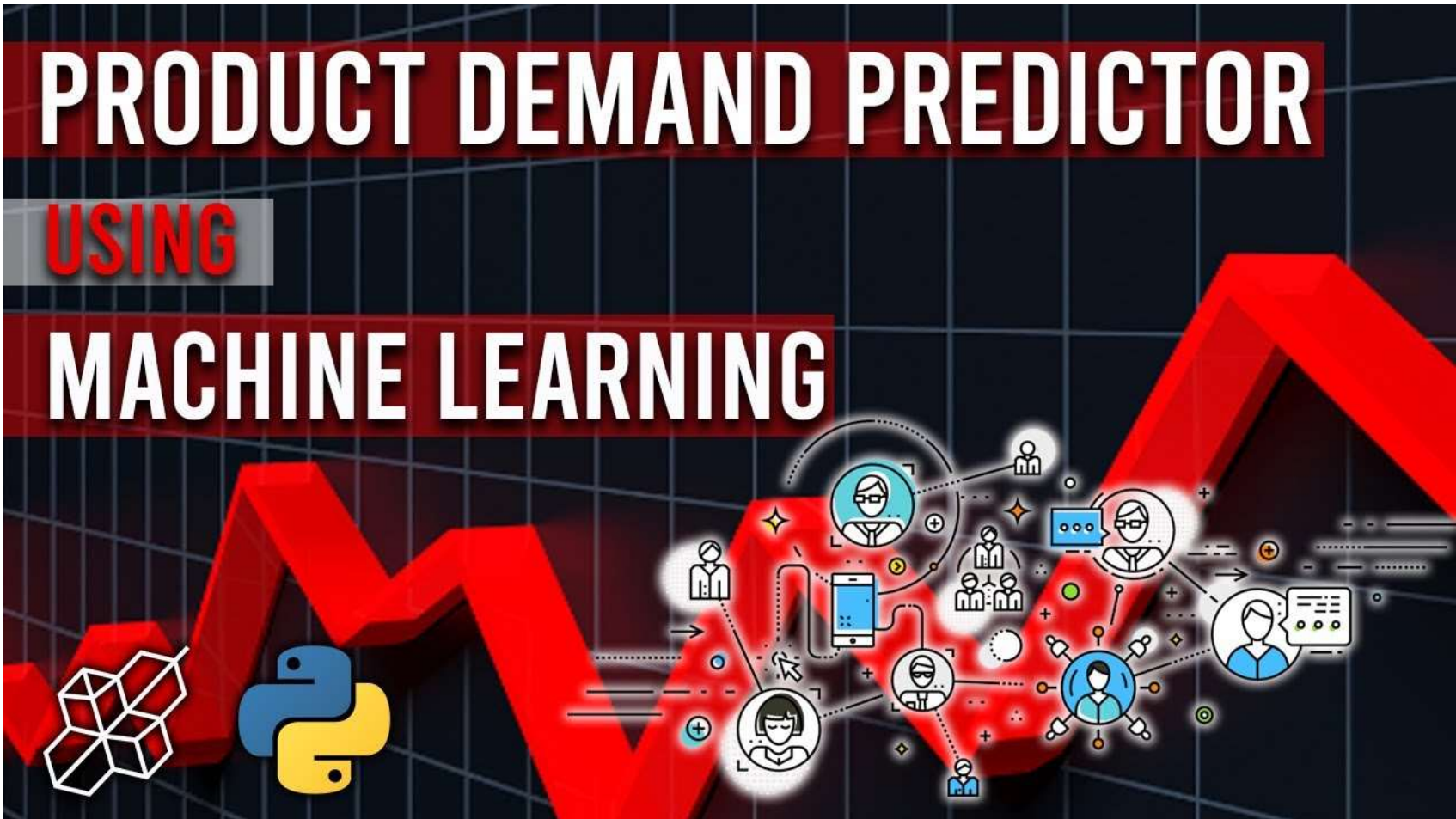


PRODUCT DEMAND PREDICTOR

USING

MACHINE LEARNING



USING

MACHINE LEARNING

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ABSTRACT

Abstract :The key to success in today's business is controlling the retails supply chain. Predicting customer demand is very essential for supply chain management. The perfect prediction has an effective impact on earning a profit., storage., lost profit., sales amount and consumer attraction. This article will produce a new method-using machine learning that will help for accurate prediction. This method collects the previous data of a store and analyze those data.

INTRODUCTION

Customer satisfaction is a vital parameter of business. Retailers always try to fulfill their demands. In a market, retailers making competition for product selling and earn profit. Retailers always look for earning more profit with calculated investment. Therefore, product demand forecasting will help them to get profit with absolute investment

DEFINING A TARGET

How to define a target in product demand prediction with machine learning a target in product demand prediction with machine learning typically involves selecting the variable you want to predict, which is usually a measure of product demand.

Understand Your Problem: First, you need a clear understanding of what you want to predict. Is it the number of units sold, revenue generated, or some other metric? Define this as your target variable.

Data Collection: Collect historical data related to your products and their associated features. This can include data on past sales, pricing, promotions, marketing efforts, seasonality, and external factors like economic indicators or weather.



SOURCE CODE

Certainly, here's a simplified example of product demand prediction using Python and scikit-learn. This example assumes you have historical data of product demand and other relevant features. We'll use a linear regression model for simplicity, but you can explore more complex models for better accuracy

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CODE

```
# Import necessary libraries
```

```
import pandas as pd
```

```
from sklearn.model_selection import train_test_split
```

```
from sklearn.linear_model import
```

```
LinearRegression
```

```
from sklearn.metrics import  
mean_squared_error, r2_score
```

```
# Load your dataset (replace 'data.csv' with your dataset)
```

```
data = pd.read_csv('data.csv')
```

```
# Assume your dataset has columns like 'feature1', 'feature2', 'demand' for features and target
```

```
# Split the data into features (X) and target (y)  
X = data[['feature1', 'feature2']]
```

```
y = data['demand']
```

```
# Split the data into training and testing sets
```

```
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)
```

```
# Create a Linear Regression model  
model = LinearRegression()
```

```
# Train the model  
model.fit(X_train, y_train)
```

```
# Make predictions  
y_pred = model.predict(X_test)
```

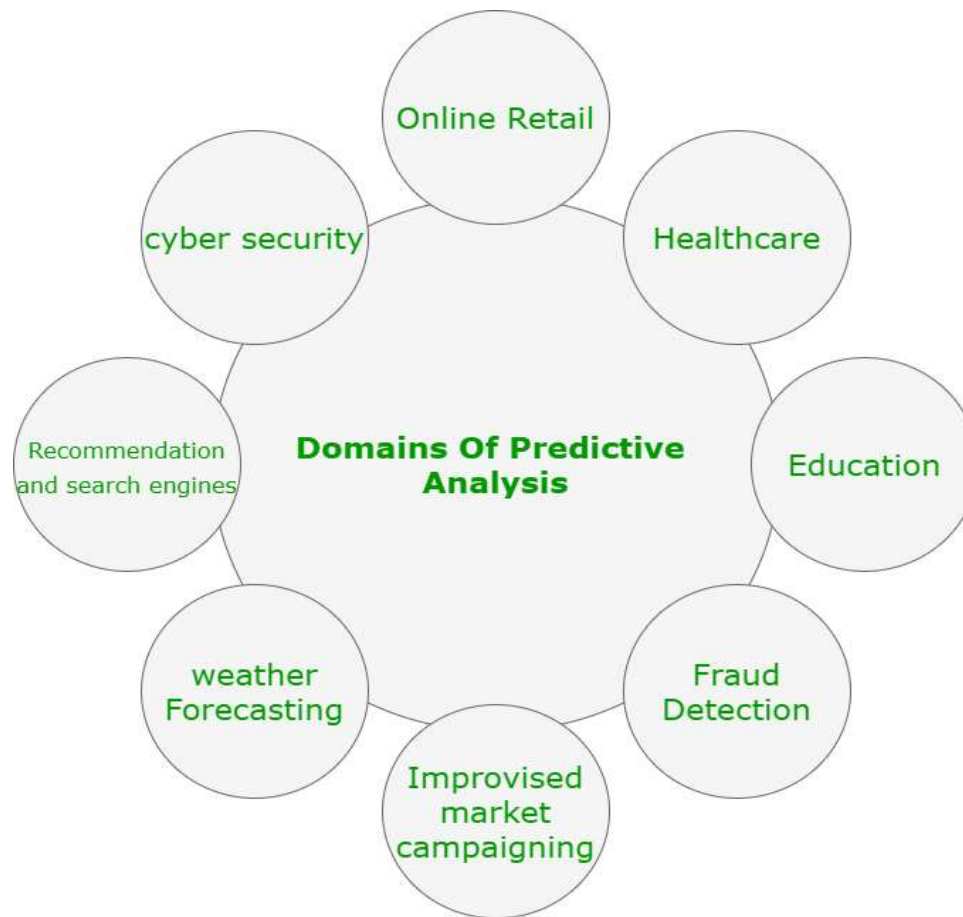
```
# Evaluate the model  
mse = mean_squared_error(y_test, y_pred)
```

```
r2 = r2_score(y_test, y_pred)
```

```
print(f'Mean Squared Error: {mse}')
```

```
print(f'R-squared (R2) Score: {r2}')
```

PREDICTION ANALYSIS PLAN



CONCLUSION

Demand prediction is one of the largest problems in a retail business. This prediction has control of stock, sales, profit, new product addition. Solving this prediction problem machine learning technology is now using in shops. There are many models existing that can predict the demand for a product. KNN, Random forest, FNN, ANN, Holt-Winters model algorithms used so far. These methods judged based on MAPE. Less MAPE considered a good method. Our study comparing the existing method with our proposed method.

THANK YOU