

ONLINE SHOPPERS INTENTIONS USING ML

Team Member-

Yash Yadav

Vivek Karmakar

Rohan

Tanisha Bhatt

INTRODUCTION-

In the ever-evolving landscape of e-commerce, understanding and catering to the intentions of online shoppers is paramount to success. Machine Learning (ML) has emerged as a powerful tool to decipher and respond to these intentions in real-time. This project aims to revolutionize the online shopping experience by harnessing the potential of ML to analyze and predict the intentions of shoppers.

The purpose of this project is twofold: to provide a highly personalized and user-centric online shopping environment and to enhance business efficiency and growth. By employing cutting-edge ML algorithms, this initiative seeks to offer shoppers tailored product recommendations, optimize website content, and streamline payment and delivery processes. Simultaneously, it equips businesses with invaluable insights into user behavior and market trends, enabling data-driven decision-making and the ability to adapt to changing consumer preferences.

Through the amalgamation of advanced ML techniques and a deep understanding of online shoppers' intentions, this project aspires to not only foster a more engaging and secure online shopping experience but also drive business growth through enhanced customer satisfaction and strategic decision-making. It represents the fusion of technology and commerce, propelling the online shopping industry into a new era of personalized, data-driven excellence.

LITERATURE SURVEY-

Existing Problem-

The digital marketplace has witnessed unprecedented growth, leading to a surge in online shoppers. However, converting visitor intent into successful transactions remains a challenge. Traditional online shopping platforms often struggle to decipher the nuanced intentions of users, resulting in suboptimal user experiences and missed business opportunities.

Problem Statement Definition-

The problem at hand revolves around the precise understanding and prediction of online shoppers' intentions using machine learning techniques. It involves the development of algorithms capable of analyzing vast datasets encompassing user behavior, preferences, and purchase history. By accurately predicting users' intentions, businesses can personalize product recommendations, optimize website interactions, and enhance overall user satisfaction. The challenge lies in creating robust machine learning models that can adapt to evolving user behaviors and market trends in real-time.

References-

In addressing this challenge, researchers and practitioners have explored various avenues, contributing valuable insights to the field of online shoppers' intentions using machine learning.

IDEATION & PROPOSED SOLUTION-

The Empathy Map-

The Empathy Map is a tool designed to help teams understand and empathize with their users or customers. In the context of online shopping intention using ML, the following canvas outlines the thoughts and feelings of users, helping to identify their needs and pain points.

- .What does the user SEE?
- .What does the user HEAR?
- .What does the user SAY and Do?
- .What does the user THINK and FEEL?

Brainstorming-

Brainstorming within the realm of online shopping intentions using machine learning offers a liberating and inclusive atmosphere. It empowers every team member to actively engage in the creative thinking process, fostering innovative solutions to challenges. Emphasizing quantity over immediate quality, brainstorming encourages the generation of diverse, out-of-the-box ideas. These ideas serve as building blocks, allowing the team to collaboratively explore and expand upon each concept. This approach fuels a collaborative spirit, where participants support one another, leading to the development of a wealth of creative solutions. Regardless of physical proximity, this brainstorming template enables teams to transcend boundaries and collectively shape groundbreaking concepts, enhancing the online shopping experience through the integration of machine learning techniques.

REQUIREMENT ANALYSIS-

Functional Requirements:

1. User Registration and Authentication:

Users should be able to register, create accounts, and log in securely. Authentication mechanisms, including two-factor authentication, should be implemented to ensure user data safety.

2. Product Search and Filtering:

Users should be able to search for products based on keywords, categories, and filters.

Advanced search options, such as sorting by price, popularity, and user ratings, should be available.

3. Personalized Product Recommendations:

Machine learning algorithms should analyze user behavior and preferences to provide personalized product recommendations.

Non-Functional Requirements:

1.Performance:

The system should handle a large number of concurrent users without performance degradation.

Web pages should load within 3 seconds to ensure a seamless user experience.

2.Security:

Implement SSL/TLS encryption to secure data transmission.

Ensure secure storage of user data and payment information.

Implement fraud detection algorithms to identify and prevent malicious activities.

3.Scalability:

The system should be scalable to accommodate increased user traffic during peak seasons or promotional events.

Scalability should be achieved through cloud-based infrastructure and load balancing techniques.

4.Reliability:

The platform should have a high uptime percentage (e.g., 99.9%) to ensure it is accessible to users at all times.

Implement regular data backups and disaster recovery mechanisms to prevent data loss

PROJECT DESIGN-

In the world of online shopping face a critical challenge: understanding and predicting user behavior. Traditional methods often fall short in capturing the nuances of customer interactions, leading to missed opportunities for personalized engagement.

Our solution employs a Machine Learning-driven approach to comprehensively analyze user behavior during online shopping sessions. By leveraging advanced algorithms, we delve into the wealth of data generated by users, identifying subtle patterns that human analysis might miss. This deep understanding enables us to customize product recommendations, optimize pricing strategies, and enhance user interfaces, ensuring a seamless and highly personalized shopping experience.

Our approach apart is the depth of analysis and precision achieved through Machine Learning. We don't just stop at generic user segmentation; instead, our algorithms discern the finest nuances of customer intent. This profound understanding allows us to predict user preferences in real-time, leading to personalized recommendations that truly resonate with individual shoppers. Our system continually learns and adapts, ensuring a continuously evolving and highly relevant customer experience.

Our solution profoundly impacts both businesses and consumers. For businesses, it translates into increased conversions, higher customer retention, and amplified brand loyalty. For consumers, it means a curated shopping journey where their needs and desires are not just met but anticipated. By reducing decision fatigue and presenting tailored options, we enhance customer satisfaction, encouraging mindful purchasing and fostering a positive relationship between consumers and brands.

CODING & SOLUTIONING-

1.Pre-processing-

Pre-processing is a crucial step in machine learning where the raw data is transformed into a format suitable for analysis and modeling. In the context of online shoppers' intention, pre-processing techniques like data cleaning, feature scaling, and handling missing values are applied. For instance.

##1.Label Encoding

```
from sklearn.preprocessing import LabelEncoder
```

2.Logistic Regression-

Logistic Regression is a classification algorithm used to predict a binary outcome (1 / 0, Yes / No) based on one or more predictor variables. In the context of online shoppers' intention, logistic regression can be employed to predict whether a shopper is likely to make a purchase (1) or not (0) based on various features such as browsing history, time spent on the website, and past purchase behavior.

Model building

```
from sklearn.linear_model import LogisticRegression  
model = LogisticRegression()
```

3.Random Forest-

Random Forest is an ensemble learning method that combines multiple decision trees to make predictions. In the context of online shopping intention, a Random Forest model can be utilized to predict customer behavior, considering various

factors such as product preferences, demographics, and interaction patterns. Random Forest can handle complex relationships in the data and provide accurate predictions.

```
##Random Forest Classifier

from sklearn.ensemble import RandomForestClassifier
model =RandomForestClassifier(criterion='entropy')
```

4.Unsupervised Learning-

Unsupervised learning techniques, such as clustering algorithms like K-Means or hierarchical clustering, can be applied to group similar online shoppers together based on their behavior or preferences. This segmentation helps businesses understand different customer segments and tailor marketing strategies accordingly. Unsupervised learning can reveal hidden patterns and trends within the data.

```
##Unsupervised_Kmeans
df['VisitorType'].value_counts()
df.head()
```

5.Matrix Evolution-

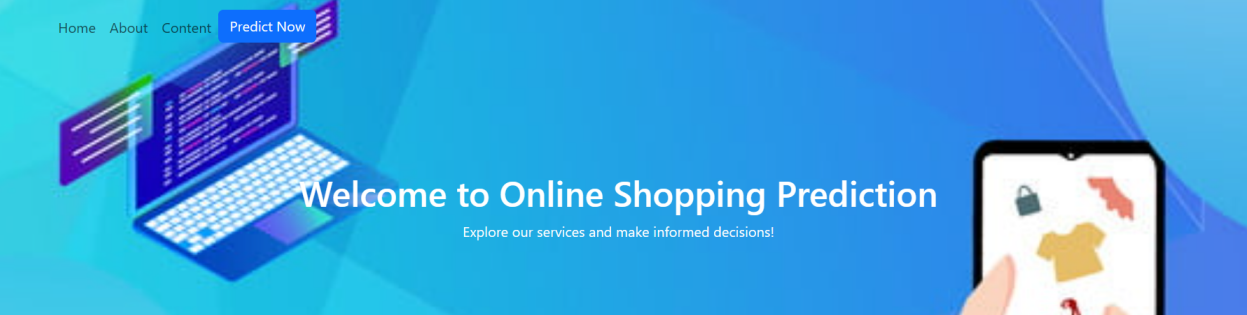
Matrix Evolution, or matrix factorization, is often used in collaborative filtering methods for recommendation systems. It involves decomposing the user-item interaction matrix into latent factors, enabling the system to predict missing entries. In the context of online shopping intention, matrix evolution techniques can be applied to provide personalized product recommendations to users based on their historical interactions and preferences.

```
] ##Evaluation_metrics  
from sklearn.metrics import accuracy_score, confusion_matrix, classification_report, roc_auc_score, roc_curve
```

6.Libraries-

```
import pandas as pd  
import numpy as np  
import seaborn as sns  
import matplotlib.pyplot as plt
```

RESULTS-



About Us

Welcome to Online Shopping Intent Prediction, where innovation seamlessly merges with your online shopping adventures. Harnessing the power of cutting-edge Machine Learning, our passionate team is dedicated to enhancing your shopping journey. With precision-driven algorithms and extensive data analysis, we anticipate your desires, offering personalized recommendations and tailored product suggestions. At the heart of our mission is your satisfaction, driving us to redefine online shopping. Whether you're a fashion connoisseur, tech enthusiast, or home decor lover, our intuitive algorithms cater to your unique tastes. Embark on this transformative experience, where technology transforms your dreams into reality. Dive into a world of curated shopping, where every click brings you closer to a future of effortless online indulgence. Welcome to the future of online shopping, welcome to Online Shopping Intent Prediction.

