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DATE:17-05-2025

TECHNOLOGY-PROJECT NAME:

Personalized marketing and customer experience

SUBMITTED BY,

Your Name and team member names:

Personalized marketing and customer experience

Project Title: AI-Driven Personalized Marketing and Customer Experience

Abstract:

This project leverages artificial intelligence (AI), machine learning (ML), and data analytics to

enhance customer experience through personalized marketing strategies. The system utilizes

customer data to segment users, predict preferences, and deliver tailored content and offers in real

time. This document provides complete project documentation, including architecture, codebase,

system walkthrough, and testing reports.

Contents:

1. Project Demonstration

2. Project Documentation

3. Feedback and Final Adjustments

4. Final Project Report Submission

5. Project Handover and Future Works

1. Project Demonstration

Overview:

A real-time demonstration will showcase the AIs ability to analyze user behavior and recommend

products and content based on individual preferences.

Demonstration Details:- User Journey: Walkthrough of a simulated customer interacting with the platform.- Real-Time Recommendations: Dynamic product suggestions based on browsing and purchase

history.

- A/B Testing Module: Testing different versions of content/offers to optimize conversion.- Security Measures: Display of customer data protection and compliance with GDPR/CCPA.

Outcome:

Stakeholders will see how AI can improve engagement, retention, and ROI through personalization.

2. Project Documentation

Overview:

Covers system design, algorithms used, and operation manuals.

Documentation Sections:- System Architecture: Diagrams of the recommendation engine, customer data flow, and analytics

dashboard.- AI Models: Description of clustering, collaborative filtering, and NLP sentiment analysis.- Code Documentation: Key modules with explanations and source code references.- User Guide: Interface usage, setting preferences, and interpreting recommendations.- Admin Guide: Data input, AI training, and campaign management.- Testing Reports: Performance benchmarks, accuracy reports, and security test results.

Outcome:

Comprehensive guide for developers, marketers, and users.

3. Feedback and Final Adjustments- Feedback Collection: From test users and marketing analysts.- System Refinement: Based on metrics such as click-through rate and conversion.- Final Testing: Ensures stable and responsive operation.

Outcome:

Product is optimized for deployment.

4. Final Project Report Submission- Executive Summary: Highlights the personalization process and its impact.- Phase Breakdown: Covers research, model development, system integration, and testing.- Challenges & Solutions: Includes handling cold start problem and data privacy issues.- Outcome: AI system ready for commercial use.

5. Project Handover and Future Works- Next Steps:

- Integration with CRM platforms (like Salesforce, HubSpot)

- Multilingual personalization

- Real-time behavioral prediction

Outcome:

Scalable marketing platform ready for future innovation

Program:

```
import pandas as pd

import matplotlib.pyplot as plt

import seaborn as sns
```

```
# Load the Walmart dataset
df = pd.read_csv('walmart.csv')

# Display basic info
print(df.head())
print(df.columns)  # Helpful to confirm actual column names

# -------- Pie Chart: Sales by Category --------
if 'Category' in df.columns and 'Weekly_Sales' in df.columns:
    df = df.dropna(subset=['Category', 'Weekly_Sales'])  # Clean missing data
    category_sales = df.groupby('Category')['Weekly_Sales'].sum()

    plt.figure(figsize=(8, 8))
    category_sales.plot(kind='pie', autopct='%1.1f%%', startangle=140)
    plt.title('Total Weekly Sales by Category')
    plt.ylabel('')
    plt.tight_layout()
    plt.show()
else:
    print("Required columns for pie chart not found.")

# -------- Line Chart: Weekly Sales Over Time --------
if 'Date' in df.columns and 'Weekly_Sales' in df.columns:
    df = df.dropna(subset=['Date', 'Weekly_Sales'])  # Clean missing data
    df['Date'] = pd.to_datetime(df['Date'], errors='coerce')  # Convert to datetime
    df = df.dropna(subset=['Date'])  # Remove bad dates
    df.sort_values('Date', inplace=True)
```

```
    plt.figure(figsize=(12, 6))
    # If seaborn throws error, you can switch to matplotlib.plot()
    try:
        sns.lineplot(data=df, x='Date', y='Weekly_Sales')
    except Exception as e:
        print("Seaborn error:", e)
        plt.plot(df['Date'], df['Weekly_Sales'])

    plt.title('Weekly Sales Over Time')
    plt.xlabel('Date')
    plt.ylabel('Weekly Sales')
    plt.tight_layout()
    plt.show()
else:
    print("Required columns for line chart not found.")
```

output: