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TECHNOLOGY-PROJECT NAME: **-** PERSONALIZED MARKETING AND CUSTOMER EXPERIENCE

SUBMITTED BY,

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Title: AI-Driven Personalized Marketing and Customer Experience

Abstract:

The AI-Driven Personalized Marketing and Customer Experience project focuses on transforming how businesses engage with customers by leveraging artificial intelligence, machine learning, and real-time analytics. The system provides tailored marketing campaigns, predicts customer behavior, and delivers personalized experiences across multiple channels. In this final phase, the solution integrates with CRM platforms, employs natural language processing for sentiment analysis, and includes secure data handling mechanisms. This report details the system demonstration, technical architecture, source code, testing results, and user documentation to support scalability and operational deployment.

Index (Suggested for Inclusion)

1. Project Demonstration

2. Project Documentation

3. Feedback and Final Adjustment

4. Final Project Report Submission

5. Project Handover and Future Works

1. Project Demonstration

Overview:

Demonstration of the personalized marketing platform, highlighting its real-time recommendation engine, behavioral targeting, and customer journey mapping.

Demonstration Details:

System Walkthrough: Live demonstration of the platform’s dashboard, campaign creation tools, and AI-generated suggestions for customer engagement.

AI Personalization Engine: Showcase of the recommendation engine using customer interaction data and preferences.

Behavioral Analytics: Real-time analysis of customer interactions across digital channels, including click-through and purchase behavior.

Performance Metrics: Insights into system efficiency, latency, and scalability under high-traffic scenarios.

Security & Privacy: Demonstration of GDPR compliance, user data anonymization, and access controls.

Outcome:

The system effectively demonstrates how personalized marketing strategies can be scaled, automated, and optimized using AI.

2. Project Documentation

Overview:

Comprehensive documentation to ensure the system is understandable and maintainable for future developers and users.

Documentation Sections:

System Architecture: Diagrams of AI modules, data pipelines, and CRM integrations.

Code Documentation: Detailed codebase with explanations of machine learning models, APIs, and frontend interfaces.

User Guide: Instructions for marketing teams on campaign setup, customer segmentation, and performance tracking.

Administrator Guide: System maintenance, performance monitoring, and troubleshooting procedures.

Testing Reports: Accuracy of recommendations, system performance under load, and security audit results.

Outcome:

Provides a well-documented blueprint for replication, scaling, or further innovation.

3. Feedback and Final Adjustments

Overview:

Collecting and incorporating feedback from marketing professionals, test users, and technical mentors.

Steps:

Feedback Collection: Surveys and usability tests during the demonstration phase.

Refinement: Addressing issues such as targeting accuracy, UI/UX adjustments, and system latency.

Final Testing: Post-adjustment performance validation and UX testing.

Outcome:

Ensures a polished and user-friendly product that aligns with stakeholder expectations.

4. Final Project Report Submission

Overview:

A complete summary of the project’s progress, accomplishments, and challenges.  
Report Sections:

Executive Summary: Overview of goals, features, and outcomes.

Phase Breakdown: Development of the AI model, integration with CRM tools, and user engagement strategies.

Challenges & Solutions: Key issues such as cold-start problems in recommendations or data privacy concerns and how they were mitigated.

Outcomes: System readiness and potential impact on marketing effectiveness.

Outcome:

Serves as the final academic and technical submission for evaluation.

5. Project Handover and Future Works

Overview:

Details for handing over the project and planning its next development phases.

Handover Details:

Next Steps: Suggestions for integrating voice-based customer feedback, predictive churn analysis, and omnichannel personalization.

Documentation & Access: Delivery of source code, user credentials, and deployment guidelines.

Outcome:

A handover package ready for industry deployment or academic continuation.

* CODE INPUT

import pandas as pd

from sklearn.neighbors import NearestNeighbors

# Sample purchase history data (user-item matrix)

data = {

'User': ['Alice', 'Bob', 'Carol', 'Dave'],

'Product\_A': [5, 4, 0, 0],

'Product\_B': [3, 0, 0, 2],

'Product\_C': [0, 0, 5, 4],

'Product\_D': [0, 2, 4, 5]

}

df = pd.DataFrame(data).set\_index('User')

# Train KNN model

model = NearestNeighbors(metric='cosine', algorithm='brute')

model.fit(df)

# Recommend for Alice

alice\_data = df.loc[['Alice']]

distances, indices = model.kneighbors(alice\_data, n\_neighbors=3)

print("Users similar to Alice:")

for i in indices[0][1:]:

print(df.index[i])

* CODE OUTPUT

Bob

Dave

Recommended products for Alice:

Product\_D 3.5

Product\_C 2.0

dtype: float64

* SOURCE CODE

For example, in Python:

def greet(name):

print("Hello, " + name)

greet("Alice")

This is source code. It can be compiled or interpreted by a computer to perform tasks — in this case, printing a greeting.

1. Data Collection and Analysis

Source code can gather and analyze customer data like:

Browsing history

Purchase behavior

Demographics

Feedback and reviews

Example (Python - simplified):

def recommend\_products(purchase\_history):

if "laptop" in purchase\_history:

return ["Laptop Bag", "Mouse", "Keyboard"]

return ["Popular Deals"]

print(recommend\_products(["laptop", "headphones"]))

2. Email or Notification Personalization

Automatically sending tailored messages based on user actions.

Example:

def send\_email(user\_name, favorite\_product):

print(f"Hi {user\_name}, check out discounts on {favorite\_product}!")

send\_email("Anita", "smartphones")

3. Dynamic Website Content

Web apps can show different content to different users based on their interests.

Example (pseudo-code for a website):

if user.interest == "sports":

show("Sports Deals")

else:

show("Trending Now")

4. Chatbots and Customer Support

Source code powers AI chatbots that provide customized support based on user history.