WIE3008/WIE3012
Group Project 1 (30%)
MestiLaku Customer Segmentation and Personalized Marketing Solution

Submission Information
Submission Week 8; Group of 4-5; Power Point Slide.

Objective
To design a data solution for *MestiLaku, an e-commerce company, that includes a conceptual Data Warehouse (DW) schema and practical ETL/BI implementation using Power BI. Students will perform ETL tasks, develop a data model, and create dashboards to provide actionable insights into customer behavior and product performance. *Company Name can change

Background of MestiLaku
MestiLaku is a growing e-commerce retailer specializing in consumer products ranging from electronics to clothing. The company aims to leverage data analytics for personalized marketing and targeted campaigns to enhance customer experience and increase customer loyalty. The project goal is to create a data-driven system that segments customers based on purchase behaviors and provides MestiLaku with insights to optimize marketing efforts.

Project Components
1. Data Warehouse Design (Conceptual Only)
Objective: Design a conceptual Data Warehouse (DW) schema to centralize customer, product, and transaction data for seamless analysis and reporting.

Task:
- Create a star schema that identifies key fact and dimension tables.
- Use the schema to outline how MestiLaku would consolidate data for comprehensive customer and product analysis.

Schema Example:
- Fact Table: Customer_Transactions_Fact with fields like transaction_id, customer_id, product_id, amount, and transaction_date.
- Dimension Tables:
  - Customer_Dimension: customer_id, name, age, gender, location, signup_date
  - Product_Dimension: product_id, product_name, category, price
  - Time_Dimension: Stores date components (transaction_date, year, month)

Deliverable:
- A simple schema diagram showing fact and dimension tables.
- A short description of each table and its role in supporting customer and product insights.

2. ETL Process in Power BI
Objective: Perform ETL tasks within Power BI to prepare customer, product, and transaction data for analysis. This includes data import, transformation, and loading directly into Power BI's data model.

Task:
- Data Import:
  - Import the provided sample datasets into Power BI.
  - Datasets (eg):

- E-commerce Customer Behavior Data: https://www.kaggle.com/datasets/carrie1/ecommerce-data
- Online Retail Data: https://www.kaggle.com/datasets/vijayuv/onlineretail
- Product Sales Data: https://www.kaggle.com/datasets/kyanyoga/sample-sales-data
- Campaign Effectiveness Data: https://www.kaggle.com/datasets/rodsaldanha/arketing-campaign

- Data Transformation:
  - Cleaning, Feature Engineering, Merging
- Data Loading:
  - Load the transformed data into Power BI's data model.
  - Set up data refresh schedules to simulate automated ETL updates.

Deliverable:
- A structured Power BI model with transformed tables ready for BI analysis.

3. BI Analysis and Dashboard Design in Power BI

Objective: Create insightful dashboards in Power BI that provide actionable insights into customer segmentation, product performance, and marketing campaign effectiveness.

Task:
- Design three dashboards:
  - Customer Segmentation Dashboard: Demographics and purchasing behavior.
  - Product Performance Dashboard: Top-performing products, revenue trends.
  - Marketing Campaign Effectiveness Dashboard: Track response rates, conversions by segment.

Deliverable:
- A set of interactive Power BI dashboards that provide insights for MestiLaku's team.

Assignment Rubric

Data Warehouse Design (Conceptual) - 5 Marks
- Schema Completeness (3 Marks): Quality and logic of fact and dimension tables.
- Explanation of Benefits (2 Marks): Clear explanation of DW advantages for MestiLaku.

ETL Process in Power BI - 11 Marks
- Data Import (3 Marks): Successful data import from all sources.
- Transformation Quality (5 Marks): Effective data cleaning, feature engineering (e.g., segmentation), and merging of tables.
- Loading and Model Completeness (3 Marks): Setup of a structured data model in Power BI with scheduling for automated updates.

BI Analysis and Dashboard Design - 10 Marks
- Dashboard Completeness (5 Marks): Quality, design, and accuracy of each dashboard.
- Insightfulness (5 Marks): Ability to interpret visualizations and provide actionable recommendations based on insights.

Project Presentation - 4 Marks
- Clarity (2 Marks): Organized and clear presentation of components.
- Strategic Insight (2 Marks): Explanation of how BI adds strategic value to MestiLaku's business goals.

Presentation Structure for MestiLaku Project

Title Slide

- Course Code: WIE3008/WIE3012
- Project Title: Customer Segmentation and Personalized Marketing Solution for MestiLaku
- Team Members: List of student names and student IDs

Introduction

- Overview of MestiLaku: Briefly introduce the company and its industry focus.
- Project Objective: Highlight the goal of the project (data-driven customer segmentation and personalized marketing).

Conceptual Data Warehouse Design

- Star Schema Overview: Show a visual diagram of the star schema.
- Fact and Dimension Tables:
  - Briefly describe the key fact table (Customer_Transactions_Fact) and main dimension tables.
- Benefits of DW: Summarize the advantages of data warehousing for MestiLaku.

ETL Process Overview in Power BI

- Data Sources: Briefly describe and list the data sources used
- ETL Process Steps: Highlight the main steps in the ETL process:
  - Data Import
  - Data Transformation (cleaning, feature engineering, merging)
  - Data Loading

ETL Process – Data Import and Transformation

- Data Import: Show screenshots of the Power BI data import process.
- Transformation Techniques:
  - Example of data cleaning, handling duplicates, and feature engineering (e.g., creating customer segments).
- Merging: Illustrate how tables are merged for a comprehensive view.

Data Model in Power BI

- Model Structure: Display a screenshot of the data model within Power BI.
- Loading and Automation: Describe the process of loading the data into Power BI's data model and any automation settings.

BI Analysis and Dashboard Overview

- Objective: Outline the purpose of each dashboard created
- Key Insights: Explain the type of insights each dashboard provides.

Customer Segmentation Dashboard

- Visualization Examples: Include screenshots of visuals showing customer segmentation by demographics and purchase behavior.
- Insights: Briefly describe the key insights this dashboard provides to MestiLaku.

Product Performance Dashboard

- Visualization Examples: Display visuals for top-performing products, product revenue by category, etc.
- Insights: Highlight how the dashboard informs inventory and sales strategies.

Marketing Campaign Effectiveness Dashboard

- Visualization Examples: Show metrics like response rates and conversion rates by customer segment.
- Insights: Explain how MestiLaku can use these insights to improve future marketing strategies.

Project Conclusion and Benefits

- Summary of Findings: Briefly summarize the project's key results and insights.
- Strategic Impact for MestiLaku: Discuss the long-term benefits of implementing a data-driven approach for customer segmentation and personalized marketing.

Practical Instructions and Resources

1. Power BI Data Import: [Power BI Data Import Guide] (https://docs.microsoft.com/en-us/power-bi/connect-data/desktop-data-sources)
   2. Data Transformation in Power BI: [Data Transformation Guide] (https://docs.microsoft.com/en-us/power-bi/transform-model/desktop-query-overview)
   3. Creating Dashboards in Power BI: [Power BI Visualization Guide] (https://docs.microsoft.com/en-us/power-bi/visuals/power-bi-visualization-types)