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DWARKADAS J. SANGHVI COLLEGE OF ENGINEERING
(Autonomous College Affiliated to the University of Mumbai)
NAAC Accredited with "A" Grade (CGPA : 3.18)

Department of Information Technology

COURSE CODE: DJS22ITL6015 **DATE: 11-02-2025**

COURSE NAME: ISIG Laboratory **CLASS: T. Y. B.Tech**

NAME: Dipti Agarwal **DIV:** IT1-1 **ROLL:** I047

Experiment No. 3

CO/LO: Describe the types of support that an information system can provide to each functional area of the organization.

AIM / OBJECTIVE: To implement Competitive Strategy through Data Analytics in Business Decision-Making

THEORY:

Implementing Competitive Strategy through Data Analytics in business decision-making involves leveraging data-driven insights to gain a competitive edge in the market. This approach allows businesses to make informed decisions, optimize operations, and respond effectively to market dynamics.

1. Competitive Strategy Basics

Competitive strategy, as defined by Michael Porter, involves creating a **unique and valuable position** in the market by:

- **Cost Leadership**: Offering products/services at lower costs than competitors.
- **Differentiation**: Providing unique value to customers.
- **Focus**: Targeting a specific market niche.

2. Role of Data Analytics in Competitive Strategy

Data analytics enhances competitive strategy by:

- **Identifying Market Trends**: Analysing customer behaviour, preferences, and market shifts.
- **Optimizing Operations**: Improving efficiency and reducing costs through data-driven insights.
- **Enhancing Customer Experience**: Personalizing offerings based on customer data.
- **Predictive Decision-Making**: Forecasting future trends and making proactive decisions.

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3. Key Components of Data-Driven Competitive Strategy

- **Data Collection**: Gathering relevant data from internal and external sources.
- **Data Processing**: Cleaning, organizing, and analyzing data.
- **Insight Generation**: Deriving actionable insights from data.
- **Strategy Formulation**: Using insights to inform competitive strategies.
- **Execution and Monitoring**: Implementing strategies and tracking performance.

Steps to Implement Competitive Strategy through Data Analytics

Step 1: Define Business Objectives

- Identify key business objectives (e.g., increase market share, improve customer retention).
- Define measurable KPIs (e.g., revenue growth, customer satisfaction scores).

Step 2: Identify Data Sources

- **Internal Data**: Sales data, customer feedback, operational metrics.
- **External Data**: Market trends, competitor analysis, social media sentiment.
- **Tools**: Use CRM systems, web analytics tools, and APIs to gather data.

Step 3: Build a Data Analytics Infrastructure

- Select Dataset
- Implement data processing tools
- Use analytics platforms (e.g., Tableau, Power BI, or Python libraries like Pandas).

Step 4: Analyze Data for Insights

- Perform analytics to understand past performance (e.g., sales trends).
- Use analytics to forecast future trends (e.g., demand forecasting).
- Apply analytics to recommend actions (e.g., pricing strategies)

Step 5: Formulate Competitive Strategies

- **Cost Leadership**: Identify cost-saving opportunities through operational data.
- **Differentiation**: Analyze customer preferences to create unique value propositions.
- **Focus**: Use segmentation data to target specific customer groups.

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Case Study: A retail company wants to increase market share by improving customer retention.

1. **Define Objectives**:
    - Goal: Increase customer retention by 10% in the next year.
    - KPI: Customer retention rate.
2. **Identify Data Sources**:
    - Internal: Customer purchase history, loyalty program data.
    - External: Competitor pricing, social media sentiment.
3. **Build Analytics Infrastructure**:
    - Gather customer data.
    - Implement a data visualization tool like Tableau.
4. **Analyze Data**:
    - Identify patterns in customer churn (e.g., customers leaving after 6 months).
    - Predict which customers are at risk of churning.
5. **Formulate Strategy**:
    - Offer personalized discounts to at-risk customers.
    - Launch a loyalty program to reward repeat purchases.

OBSERVATION:

Step 1: Define Business Objectives

- **Objective**: Increase market share by targeting high-performing, high-demand vehicles.
- **KPIs**:
    - **Revenue Growth**: Increase in MSRP of vehicles sold.
    - **Customer Satisfaction**: Popularity of vehicles (based on features such as engine power, fuel efficiency).
    - **Market Segmentation**: Identify vehicles that meet specific customer needs, like luxury, performance, or fuel efficiency.

Step 2: Identify Data Sources

- **Internal Data**:
    - Sales data: MSRP, vehicle popularity, vehicle characteristics (make, model, engine, transmission type).
    - Operational metrics: Performance of different vehicle categories.
    - Customer feedback data on vehicle style and preferences.
- **External Data**:

  - Market trends in the automotive industry, such as fuel type trends, preferences for manual vs. automatic transmissions, demand for compact vehicles, etc.
  - Competitor pricing and product offerings in similar categories.
  - Social media sentiment and consumer reviews (if available).
- **Tools**:
  - Use CRM (Customer Relationship Management) data for sales and customer interaction history.
  - Tableau, Power BI, or Python libraries (e.g., Pandas) for analytics and visualization.

Step 3: Build a Data Analytics Infrastructure

- **Dataset Selection**:
  - Select relevant columns from the dataset: `Make`, `Model`, `Year`, `Engine HP`, `Transmission Type`, `Driven_Wheels`, `Vehicle Style`, `highway MPG`, `city mpg`, `Popularity`, `MSRP`.
- **Data Processing Tools**:
  - Use **Tableau** for visualization and dashboards to track performance.
  - Clean the data by handling missing values and outliers.
  - Standardize formats for consistency (e.g., fuel types, engine types, transmission types).
- **Analytics Platforms**:
  - Tableau for building interactive dashboards that display key metrics, including:
    - Price comparisons by make/model and performance.
    - Popularity heatmaps for vehicle models and styles.
    - Correlations between engine power, fuel efficiency, and pricing.

Step 4: Analyze Data for Insights

- **Past Performance**:
  - Use Tableau to visualize past sales data, focusing on vehicle popularity, MSRP, and features such as horsepower and fuel efficiency.
  - Identify which models performed best (e.g., BMW 1 Series with 300 HP has higher MSRP and popularity).
- **Forecasting Future Trends**:
  - Create a trendline for future sales based on past popularity and pricing trends. Forecast the potential demand for specific categories (e.g., high-performance, luxury cars).
  - Use regression models to forecast MSRP based on features (engine power, fuel type, transmission type, etc.).
- **Recommending Actions**:

- **Pricing Strategy**: Based on competitor analysis and demand trends, adjust pricing strategies for high-demand models.
- **Market Positioning**: Use customer preference data to create customized marketing strategies for specific segments (e.g., targeting fuel-efficient cars for eco-conscious consumers).

Step 5: Formulate Competitive Strategies

- **Cost Leadership**:
  - **Data Analysis**: Identify lower-cost features in vehicles (e.g., fewer cylinders or lower engine power) that still maintain competitive performance.
  - **Action**: Position lower-priced models as value-driven options with a competitive edge in fuel efficiency or other key features.
- **Differentiation**:
  - **Data Analysis**: Identify models with unique features (e.g., rear-wheel drive, high-performance engines) that cater to luxury or high-performance vehicle customers.
  - **Action**: Promote high-end models with superior features as luxury or high-performance vehicles in the market. Adjust MSRP based on competitive pricing data.
- **Focus Strategy**:
  - **Data Analysis**: Use vehicle style (e.g., convertible vs. coupe) and market category (e.g., luxury) to target niche customer groups.
  - **Action**: Develop targeted marketing campaigns focusing on high-demand, specific vehicle styles (e.g., compact luxury cars, performance-oriented vehicles).

Example Tableau Dashboard Metrics

- **Vehicle Popularity vs. MSRP**: A scatter plot to compare the popularity of each model against its price.
- **Fuel Efficiency by Vehicle Style**: A line graph to show fuel efficiency (city MPG and highway MPG) for different styles (coupe, convertible).
- **Engine Power and Transmission**: Bar charts showing how different engine powers correlate with manual or automatic transmission types.

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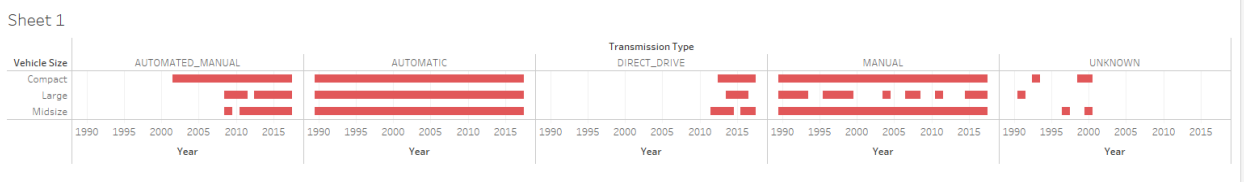

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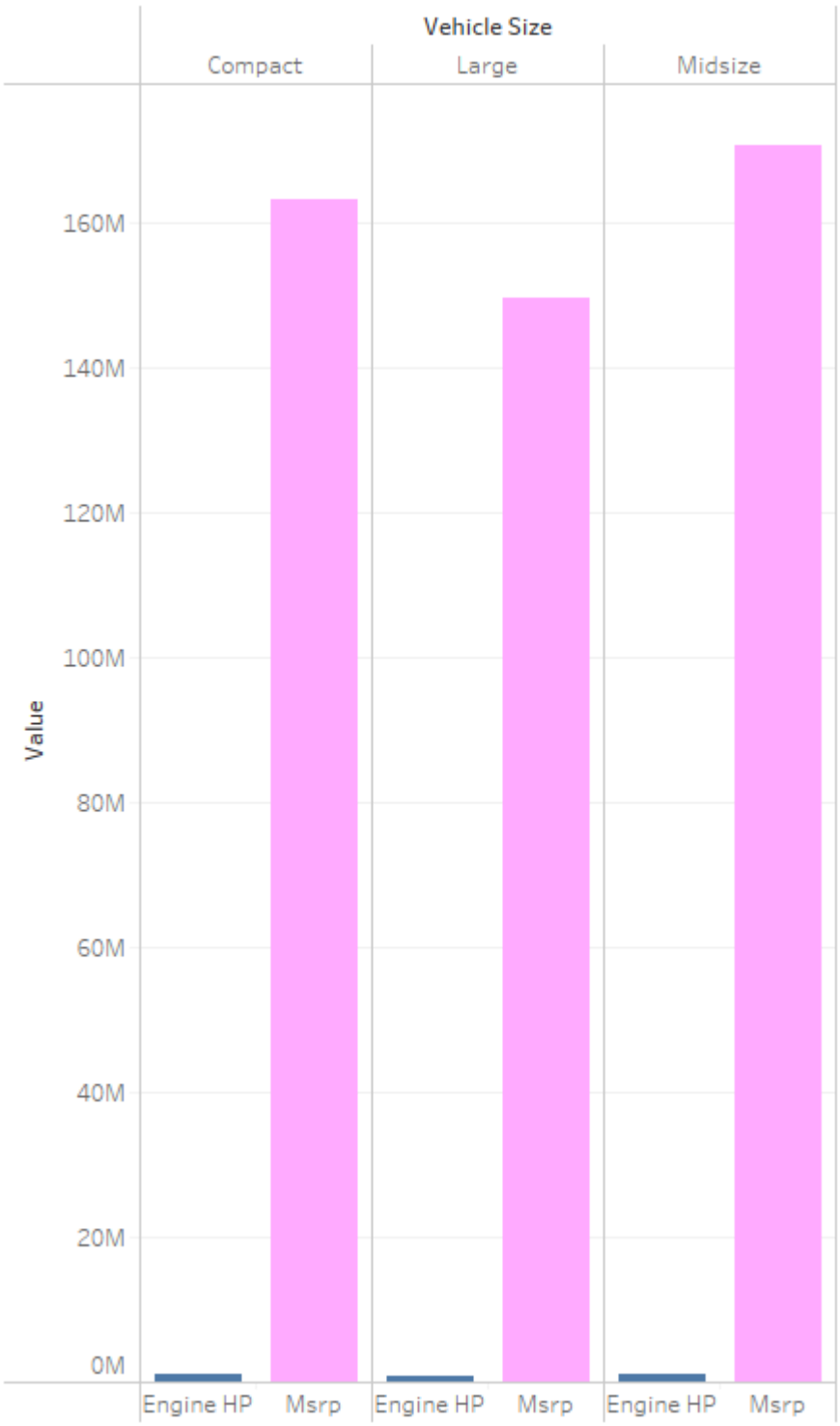
Sheet 2



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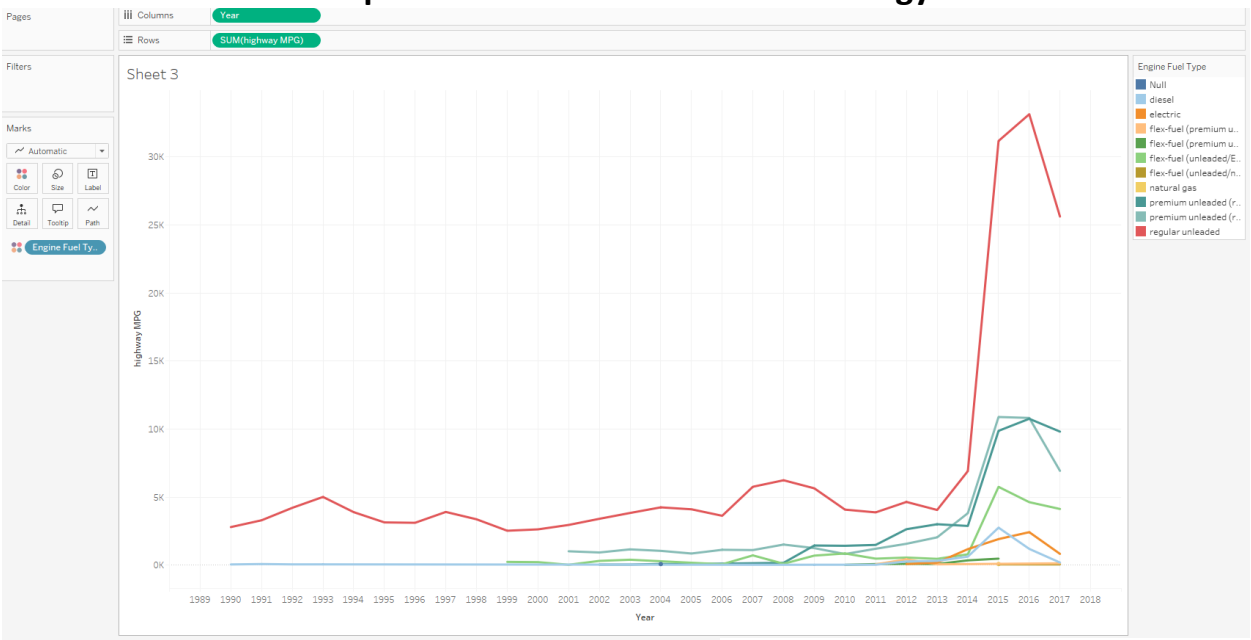

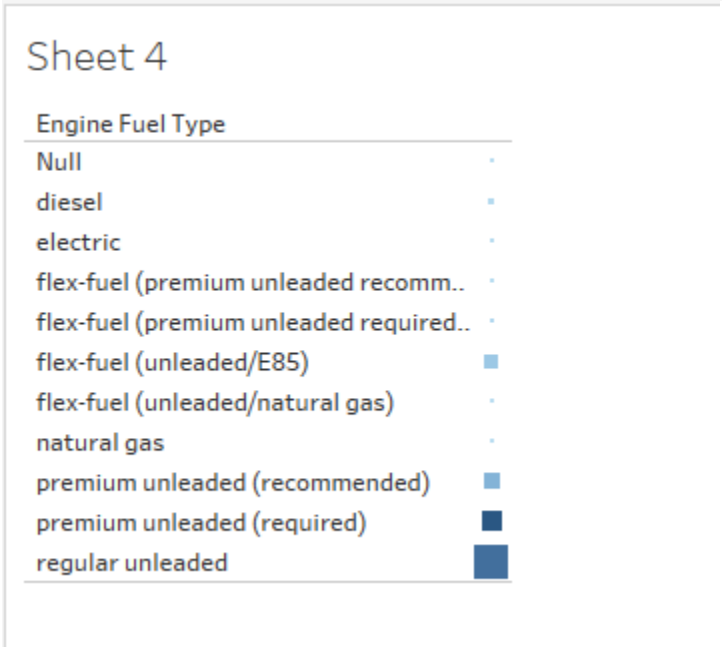

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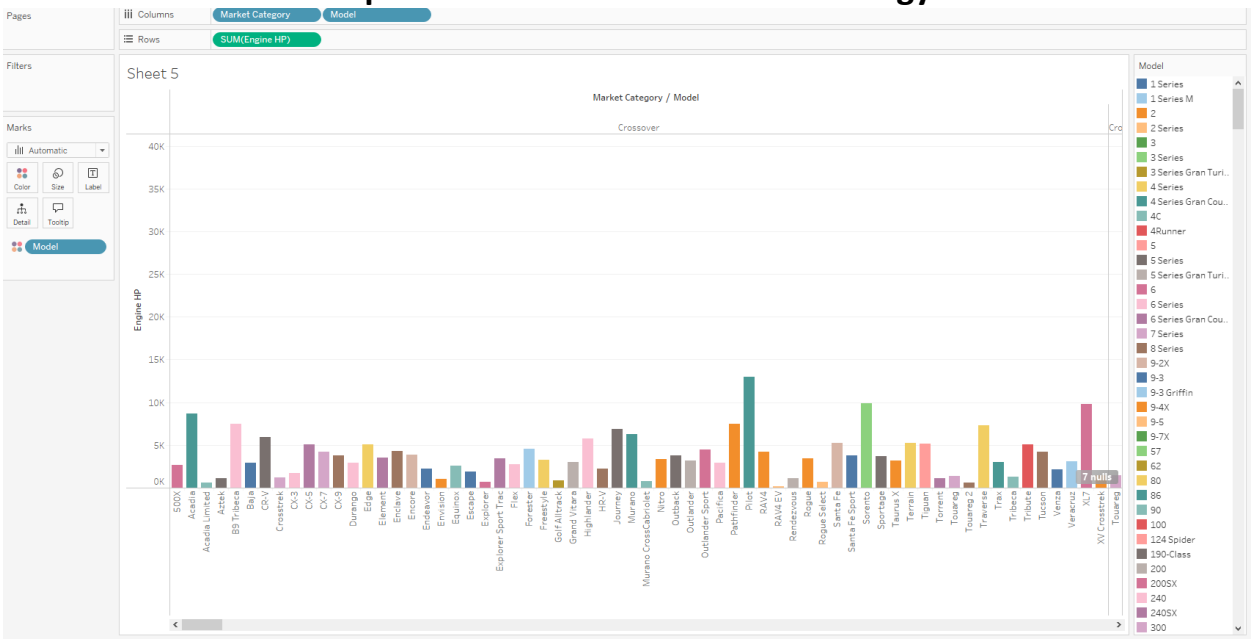

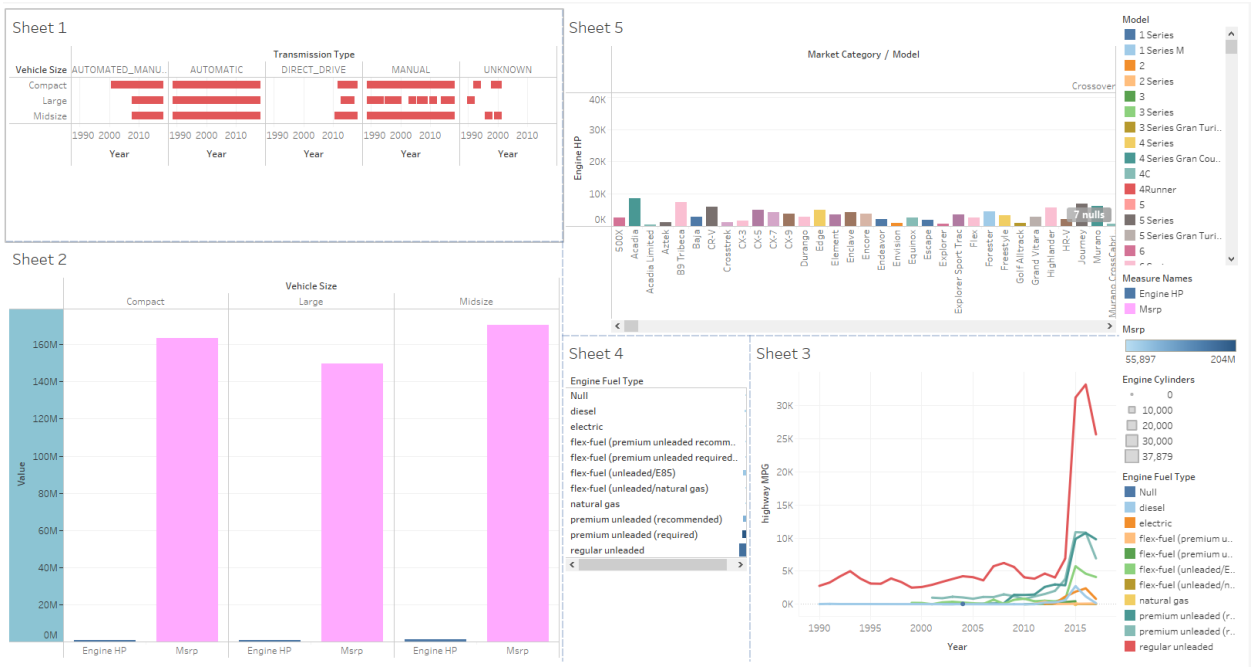

CONCLUSION:

In this experiment we implemented Competitive Strategy through Data Analytics in Business Decision-Making

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QUESTIONS:

1. What Porter's competitive strategy should a luxury fashion brand adopt to enhance its online presence while preserving exclusivity and why?
2. A startup in the food delivery industry wants to gain a competitive edge. Based on Porter's Five Forces Model, what IT-based strategies can the startup adopt to reduce competitive rivalry and improve customer loyalty?

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2. Provost, F., & Fawcett, T. (2013). Data Science for Business.