

COURSE: DATA ANALYTICS WITH COGNOS
PHASE I: PROJECT SUBMISSION PART I
TITLE: PRODUCT SALES ANALYSIS

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Project Title: Product Sales Analysis

Problem Definition:

The project involves using IBM Cognos to analyze sales data and extract insights about top selling products, peak sales periods, and customer preferences. The objective is to help businesses improve inventory management and marketing strategies by understanding sales trends and customer behavior. This project includes defining analysis objectives, collecting sales data, designing relevant visualizations in IBM Cognos, and deriving actionable insights.

Design Thinking:

1. Analysis Objectives:

- **Identifying Top-Selling Products:**
 - Determine the top-selling products based on total sales revenue or units sold.
 - Identify any seasonal variations in the sales of these products.
 - Discover the geographical regions or customer segments where these products perform exceptionally well.
- **Analyzing sales trends:**
 - Identify overall sales trends over time (e.g., monthly, quarterly, or annually).
 - Detect any sudden spikes or dips in sales and investigate their causes.
 - Determine if there are specific products or product categories that exhibit consistent growth or decline in sales.
- **Understanding customer preferences:**
 - Segment customers based on demographics (age, gender, location), purchase history, and behavior (e.g., frequent shoppers, one-time buyers).

- Identify the most preferred products or product categories for each customer segment.
- Analyze how customer preferences change over time and in response to marketing campaigns.

2. Data Collection:

- Sales Data:

- **Point of Sale (POS) System:** Collect transaction-level data from the point of sale system if available. This should include details such as product IDs, transaction dates and times, quantities sold, and prices.
- **Historical Sales Records:** Gather historical sales records covering an extended period to identify long-term trends and seasonality.
- **Sales Channels:** Include data from all sales channels, whether it's in-store, online, or through third-party retailers.

- Product Data:

- **Product Catalog:** Obtain a comprehensive product catalog that includes product names, descriptions, categories, and attributes.
- **SKU Information:** If applicable, collect data on stock-keeping units (SKUs) for each product, which can help in tracking inventory at a granular level.
- **Pricing Information:** Include pricing data for each product, including regular prices, discounts, and any special pricing structures.

- customer demographics:

- For data collection in this project, customer demographics encompass a comprehensive set of information about the individuals who engage in transactions.
- This includes but is not limited to age, gender, location, income level, occupation, marital status, educational background, and household size. Gathering data on these demographic attributes allows for segmentation and analysis of the customer base, aiding in the identification of target customer groups, understanding their preferences, and tailoring marketing strategies.
- Moreover, it provides insights into the potential impact of demographic factors on purchasing behavior and sales trends, facilitating data-driven decisions for inventory management and marketing efforts.

- Transaction records:

- The transaction record for the data collection in this project comprises a set of crucial details pertaining to a sales transaction. Each record is uniquely identified by a Transaction ID and includes essential information such as the Transaction Date and Time, Customer ID, Customer Name, Payment Method, and the Total Amount of the purchase.
- It also encompasses a comprehensive list of the Products Purchased, with each product identified by a unique Product ID, Product Name, Quantity, Unit Price, and Subtotal.
- Additionally, the record features both the Shipping Address and Billing Address, offering insights into customer locations and payment details, and specifies the Sales Channel through which the transaction was conducted, providing context for the sales channel's performance and effectiveness in driving revenue.

3. Visualization Strategy:

- To visualize the insights using IBM Cognos and create interactive dashboards and reports, we will follow a structured plan. First, we will import the cleaned and prepared sales data into IBM Cognos. Next, we'll design a set of interactive dashboards that cater to various user needs, incorporating dynamic filters and drill-down options for in-depth exploration.
- Key insights, such as top-selling products, sales trends, and customer preferences, will be presented using appropriate chart types, including bar charts, line graphs, pie charts, and heatmaps. We'll ensure that visualizations are clear, labeled, and use a consistent color scheme for readability.
- Additionally, we will integrate geospatial data if applicable, providing regional insights on a map. For time series analysis, time-based visualizations will be created to capture trends over different periods. Throughout the process, we'll emphasize responsiveness and accessibility, ensuring that the dashboards and reports work well on various devices and are accessible to all users.
- Finally, thorough documentation and training materials will be provided to support users in effectively utilizing the interactive dashboards and reports to make data-driven decisions for optimizing inventory management and marketing strategies.

4. Actionable Insights:

- The derived insights from the analysis of sales data in IBM Cognos provide actionable guidance for optimizing both inventory management and marketing strategies.
- By identifying top-selling products and understanding customer preferences, businesses can prioritize stock levels and tailor marketing campaigns to promote these high-demand items. Analysis of sales trends and peak sales periods informs inventory stocking strategies to ensure adequate supply during surges in demand, reducing stockouts and improving customer satisfaction.
- Insights into the effectiveness of marketing campaigns and channels help allocate resources more efficiently, targeting the right audience with the right promotions.
- Additionally, by forecasting future sales trends, businesses can make data-driven decisions on inventory replenishment and marketing planning.
- Overall, these insights enable businesses to reduce carrying costs, minimize lost sales opportunities, enhance customer experiences, and maximize ROI on marketing investments.