Phase 1: Problem Definition and Design Thinking

Problem Definition:

PRODUCT SALES ANALYSIS

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. Specific Insights
   - The specific insights which will be extracted from the sale data includes
     - ✓ identifying top-selling products,
     - ✓ analyzing sales trends, and
     - ✓ understanding customer preferences.
2. Data Collection:
   - The data can be collected via datasets regarding 'sales-stores product details' in open source repositories such as 'Kaggle'.
   - 'Cleaning' and 'Pre-processing' of dataset to remove the duplicate values, handle missing values and standardize the data formats.
   - Ensuring the data quality ,quantity and accuracy.
3. Visualization Strategy:
   - Before visualization, Depending on the complexity of the dataset, appropriate data model must be created. This involves defining relationships between different parts of data, creating calculated fields, conversion of data types such as one hot encoding (conversion of categorical to numerical data) and aggregating data to the required granularity.
   - Using IBM Cognos Framework Manager or Data modules to import and connect your prepared data to the Cognos environment.
   - Designing reports and dashboards in IBM Cognos that are tailored to the analysis objectives.
   - Different visualizing techniques such as :
     - ✓ Bar charts or Tables - for 'Top-Selling-Products'
     - ✓ Line charts or time-series graphs - for 'Peak Sales Periods'
     - ✓ Pie charts or heat maps - for 'Customer Preferences' is to be adopted .
4. Actionable Insights:
   - Using IBM Cognos features like filters, calculations, and drill-down capabilities to analyze the data interactively.
   - Applying statistical methods (such as univariate, bivariate and multivariate analysis) and algorithms to uncover patterns, correlations, and outliers.
   - If analyzing sales trends over time, use time-series analysis techniques. Decomposing time series data to separate trends, seasonality, and residuals.
   - For more advanced insights, machine learning model could be built. Predictive models can forecast future sales, customer behavior, or demand for specific

products.

- Clustering algorithms can identify customer segments with distinct preferences. Recommendation systems can suggest products based on past customer behavior.