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PL/SQL Project

CustoVision: Customer Needs Prediction System

1. Project Overview

CustoVision is a PL/SQL-based intelligent system designed to help businesses predict what their customers will need before they need it. By analyzing past sales data, customer behavior, and seasonal buying patterns, the system generates accurate demand forecasts and customer insights. This helps businesses prevent stockouts, reduce unnecessary purchasing, and make data-driven decisions in real time.

The project focuses on integrating forecasting algorithms directly inside the Oracle database using PL/SQL procedures, functions, triggers, and packages. The result is a smart, automated prediction engine that assists inventory planning, supply chain efficiency, and marketing strategies.

2. Project Objective

The main objective of CustoVision is to create a simple but powerful prediction system that businesses can rely on. The system aims to:

Forecast customer demand based on historical sales patterns

Classify customers according to their buying behavior

Identify products that may run out soon

Provide managers with clear, automated reports for decision-making

3. Key Features

a. Sales Data Analysis

The system analyzes past transactions including product categories, dates, quantities sold, and customer IDs to identify buying trends and behavior patterns.

b. Demand Forecasting

CustoVision uses PL/SQL to apply statistical forecasting methods such as:

Moving averages

Weighted averages

Linear trend estimation

These algorithms predict how much of each product will be needed in upcoming weeks or months.

c. Customer Segmentation

-Customers are grouped based on:

-Purchase frequency

-Preferred product types

-Seasonal or occasional buying patterns

This helps businesses target promotions and understand which customers are most valuable.

d. Automated Alerts & Reporting

The system produces PL/SQL-generated reports that summarize:

-Predicted demand per product

-Current stock vs. expected needs

-Products at risk of shortage

-Segmented customer categories

-Alerts notify managers when expected demand is higher than available stock.

4. Database Schema

CustoVision relies on three main tables:

- Products**(product_id (PK);product_name;Category;unit_price)
- Sales_History**(sale_id (PK);product_id (FK);sale_date;quantity_sold;customer_id (FK))
- Customers**(customer_id (PK);customer_name;demographics / behavior info)

This structure supports accurate forecasting, segmentation, and reporting.

5. Innovation and PL/SQL Implementation

CustoVision is innovative because all the intelligence happens inside Oracle using PL/SQL—not with external analytic tools. Key components include:

- Forecasting functions** to calculate moving averages and trends
- Customer classification procedures** to group buyers
- Triggers** that update forecasts automatically when new sales data is inserted
- Reporting packages** that generate formatted summaries and alerts

This demonstrates mastery of PL/SQL in a real-world, business-focused problem.

6. Implementation Steps

- Build database tables and relationships
- Insert sample product, customer, and sales data
- Develop forecasting functions and procedures
- Implement customer segmentation logic
- Create triggers for automatic prediction updates
- Build reporting and alert modules
- Test predictions against historical data
- Finalize documentation and demonstration

7. Expected Outcomes

Upon completion, CustoVision will deliver:

- Accurate demand predictions
- Early warnings for low-stock products
- Customer segmentation insights
- Automated reports for decision-making
- A fully functional PL/SQL-based predictive system
- Practical experience in forecasting, analytics, and database development