

# Phase VI: Database Interaction and Transactions

## Objective:

Phase VI of CustoVision develops the **PL/SQL layer** for interacting with the database, performing transactions, analytics, and automated reporting.

## Procedures:

3–5 parameterized procedures perform INSERT, UPDATE, and DELETE operations on Sales\_History, Forecasts, and Alerts.

Procedures handle **IN/OUT/IN OUT parameters**, enforce data validation, and include exception handling to maintain integrity.

**Functions:** 3–5 functions handle calculations (demand prediction), validations (stock checks), and lookups (customer segment retrieval).

Functions return specific data types and raise exceptions for invalid inputs.

## Cursors & Bulk Operations:

Explicit cursors enable row-by-row processing for reporting and analytics.

Bulk operations optimize performance for large datasets.

## Window Functions:

Implemented ROW\_NUMBER(), RANK(), DENSE\_RANK(), LAG(), LEAD(), and aggregates with OVER. Supports customer/product ranking, period comparisons, running totals, and trend analysis.

## Packages:

Procedures and functions grouped into **PL/SQL packages** for modularity.

Packages include **specifications** (public interface) and **bodies** (implementation).

## Exception Handling & Logging:

Predefined and custom exceptions handled.

Errors logged in audit tables for recovery and monitoring.

## Testing:

Each procedure and function tested with edge cases, null values, and high-volume data.

Test queries validated DML operations, cursors, and window function results.

Performance benchmarks recorded to ensure efficiency.

## Outcome & MIS Relevance:

Fully functional PL/SQL layer enables **automated data management, predictive analytics, and stock alerts**.

Ensures **data integrity, accuracy, and efficiency** for decision-making in inventory and marketing.

Serves as a foundation for **business intelligence reporting** and MIS operations.