**Oracle APEX Business Analyst Project: Operational Analysis for OT.**

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**Date: 11 September 2025**

**Introduction:**

This project involved the design and development of an interactive Business Intelligence Web App using Oracle Application Express (APEX). The primary goal was to transform OT's raw operational data into actionable insights, enabling management to make informed, data-driven decisions, I personally chose the route of trying to enhance profitability, optimize inventory, understand customer value, and improve order management processes.

The Web App provides a centralized view of key performance indicators (KPIs) across four critical business domains: Product Performance, Customer Analytics, Inventory Management, and Order Status Tracking. This report details the methodology used to build the APEX application and provides a deep dive into the insights derived from each of its core components.

**Methodology:**

The Web App was built using Oracle APEX, a low-code development platform ideal for rapidly creating data-driven web applications. The process began with a thorough analysis of OT's database schema to identify key tables and relationships.

The application consists of a four page Web Application each page having sophisticated SQL queries. These queries were crafted to aggregate and analyze data from multiple tables, calculating metrics such as total revenue, profit margin, lifetime customer value, and inventory valuation. Each region was configured using APEX's built-in components:

Interactive Reports were used for detailed tabular data, allowing users to sort, filter, and drill down into the information.

Chart Regions were employed to provide visual summaries of the data, such as bar charts, pie charts, pyramids and donut charts, making trends and comparisons immediately apparent.

The pages were styled with HTML and CSS for clarity and professionalism, ensuring that the most critical metrics are prominent and easy to understand.

This approach ensures that the Web App is not just a static report but a dynamic tool for ongoing business analysis.

**Analysis of Insights:**

1. **Product Category Analysis:**

**Business Question:** Which product categories are the most and least profitable, and what are their respective contributions to overall revenue and units sold?

Description: This report was built using an SQL query that joins product, category, order, and order item tables. It groups the results by category to calculate the sum of revenue (Total\_Sales \* Unit\_Price) and profit (Total\_Sales \* (Unit\_Price - Cost\_Price)). The profit margin is derived by dividing total profit by total revenue and formatting the result as a percentage.

**The Insight:** The analysis reveals crucial strategic information. While the CPU category generates the highest Total Revenue ($12.27M), it does not have the highest profit margin. Both the Motherboard and Storage categories boast the highest Profit Margin at 20.8%. This indicates that although CPUs are a major revenue driver, Motherboards and Storage devices are more cost-effective to sell relative to their price.

**Recommendation: OT should:**

Capitalize on High-Margin Categories: Prioritize marketing and promotional efforts for Motherboards and Storage products to maximize profitability.

Review CPU Pricing and Costs: Investigate the reasons behind the CPU's lower margin (18.52%). A strategic price increase or a review of supplier costs for CPUs could significantly boost overall profits.

Manage Portfolio: Ensure adequate stock levels for high-revenue CPUs and high-margin Motherboards/Storage to avoid stockouts, as these are key business drivers.

1. **Top Customers by Lifetime Value:**

**Business Question:** Who are our most valuable customers based on their total historical spending (Lifetime Value), and what are their characteristics?

Description: This query joins customer, order, and the order items table. It calculates the Lifetime Value for each customer by summing the value of all their completed orders. The results are sorted in descending order to highlight the top clients.

**The Insight:** The report clearly identifies General Mills as OT's most valuable customer, with a Lifetime Value of over $3.1 million. The top 10 list is dominated by large corporations, many with high credit limits ($500k-$600k). However, a critical insight is that a high credit limit does not always equate to a high Lifetime Value (e.g., Raytheon has a high LTV with a low $100k limit). Furthermore, the Average Order Value varies significantly, with NextEra Energy having a very high Average Order Value compared to others.

**Recommendation: OT should:**

Implement Tiered Account Management: Assign dedicated account managers to top-tier clients like General Mills and NextEra Energy to nurture these relationships, ensure satisfaction, and identify up-sell opportunities.

Analyze Buying Patterns: Understand why NextEra Energy's Average Order Value is so high and replicate those sales strategies with other customers in similar industries.

Review Credit Policies: Raytheon's high value despite a low credit limit suggests they are a reliable payer. OT should consider proactively increasing their credit limit to facilitate even larger orders and strengthen the business relationship.

1. **Warehouse Inventory Value Analysis:**

**Business Question:** How is our inventory capital distributed across the global warehouse network, and which locations hold the most value?

Description: This query aggregates data from warehouse, product, and inventory tables. It calculates the total value of all stock on hand in each warehouse (SUM(Quantity \* Cost\_Price)) and presents it alongside the total number of units and distinct products.

**The Insight:** There is a significant imbalance in inventory distribution. The San Francisco warehouse holds the highest Inventory Value at over $18.7 million, which is more than double the value of the Mexico City warehouse ($5.69M). Sydney and Seattle also hold very high-value stock. This concentration of capital in a few warehouses represents a significant risk and opportunity cost.

**Recommendation: OT should:**

Mitigate Risk: Such a high value in a single geographic location (San Francisco) exposes OT to significant risk from natural disasters, logistical disruptions, or local economic changes. A strategy to redistribute high-value inventory to other secure warehouses should be developed.

Optimize Capital: Tying up $18.7M in one warehouse's stock is capital that could be used elsewhere. Supply chain logistics should be analyzed to see if lead times can be reduced, allowing for lower safety stock levels in San Francisco.

Align with Sales Data: This inventory data must be cross-referenced with the sales data from the Product Analysis. High-value, slow-moving items in San Francisco could be relocated to warehouses closer to emerging markets with higher demand for those products.

1. **Canceled Orders Report:**

**Business Question:** What are the characteristics of canceled orders, and are there patterns in terms of customers, salespeople, or timing?

Description: This query filters the orders table for orders with a 'Canceled' status. It joins with customer and salesman tables to provide context on who placed the order and who was managing the account, and calculates the age of the canceled order.

**The Insight:** The report reveals that cancellations are not isolated to recent events but span several years, with some orders canceled over 9 years ago. Notably, some canceled orders from major clients like General Mills and Nucor are linked to specific sales representatives (e.g., Florence Freeman, Daisy Ortiz). Alarmingly, two orders (for Eli Lilly and Facebook) have no assigned salesperson, suggesting a process failure in account management.

**Recommendation: OT must:**

Investigate Root Causes: Management needs to investigate the specific reasons behind these cancellations, particularly for high-value clients. Is it due to price, delivery delays, product specs, or salesperson performance?

Review Sales Processes: The missing salesperson data indicates a critical flaw in the sales process. OT must implement checks to ensure every order is assigned to a representative for accountability and customer support.

Implement a Cancellation Feedback Loop: A formal process should be created to log the reason for every cancellation. Analyzing this data will help identify systemic issues (e.g., long lead times, poor communication) that can be addressed to reduce future cancellation rates.

**Conclusion:**

The Oracle APEX Web App developed in this project successfully transforms OT's complex operational data into a clear, actionable strategic tool. The insights generated answer fundamental business questions that directly impact profitability and efficiency.

Key takeaways include the need to shift marketing focus towards high-margin products, the imperative to protect and grow relationships with top-tier customers, the urgent requirement to re-balance inventory to mitigate risk and free up capital, and the critical need to analyze and learn from order cancellations.

This dashboard provides OT's management with a single source of truth for monitoring these KPIs. By regularly reviewing these reports, OT can move from reactive problem-solving to proactive, data-driven strategy execution, ultimately leading to improved financial performance, reduced operational risk, and a stronger competitive position in the market. Future enhancements could include setting up email alerts for critical metrics and adding drill-down capabilities for even deeper analysis.