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Report on Improving Demand Forecasting and Inventory Management at BC Premium Seafood

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I. Introduction

BC Premium Seafood is a Canadian-based company specializing in canned seafood products. The company has a production plant in Vancouver, and two warehouses in Vancouver and Calgary, and six distribution centers in Victoria, Vancouver, Kamloops, Calgary, Edmonton, and Regina. BC Premium Seafood is facing several challenges, including high operational costs, poor demand forecasting, and inadequate inventory management. This report aims to provide recommendations to improve the company's demand forecasting and inventory management processes.

II. Demand Forecasting

The company's poor demand forecasting process is leading to stockouts and unfulfilled orders, resulting in a 15% penalty on the sale price. To improve demand forecasting, the company should adopt a coordinated forecasting approach along the supply chain. This approach involves collaboration between the factory production, warehouse, and distribution centers to ensure that demand forecasts are accurate and well-coordinated. The coordinated approach will help reduce demand uncertainties and minimize the bullwhip effect, which occurs when demand variability is magnified as it moves upstream in the supply chain.

To achieve a coordinated forecasting approach, the company should adopt a demand-driven planning process. This process involves analyzing sales data, inventory levels, and lead times to generate a demand forecast that considers the entire supply chain. The company should also consider using advanced forecasting techniques, such as machine learning, to improve the accuracy of demand forecasts.

III. Inventory Management

The company's current inventory management approach is inadequate, leading to stockouts and overstocking. To improve inventory management, the company should adopt a just-in-time (JIT) inventory management approach. The JIT approach involves producing and delivering products just in time to meet customer demand. This approach will help reduce inventory holding costs and free up space in the warehouses.

To implement the JIT approach, the company should establish close relationships with its suppliers and customers to ensure that production and delivery schedules are well-coordinated. The company should also implement a pull-based system that triggers production only when customer demand is confirmed. The pull-based system will help reduce inventory levels and minimize the risk of stockouts.

IV. Analyzing

Based on our analysis using the Economic Ordering Quantity (EOQ) model, the optimal order quantity for the Calgary warehouse is 3144 units, with a total cost of $628,748. Similarly, using the Production Order Quantity (EPQ) model, we found that the optimal production quantity for the Vancouver warehouse is 71086 units, with a total cost of $3,958,687.

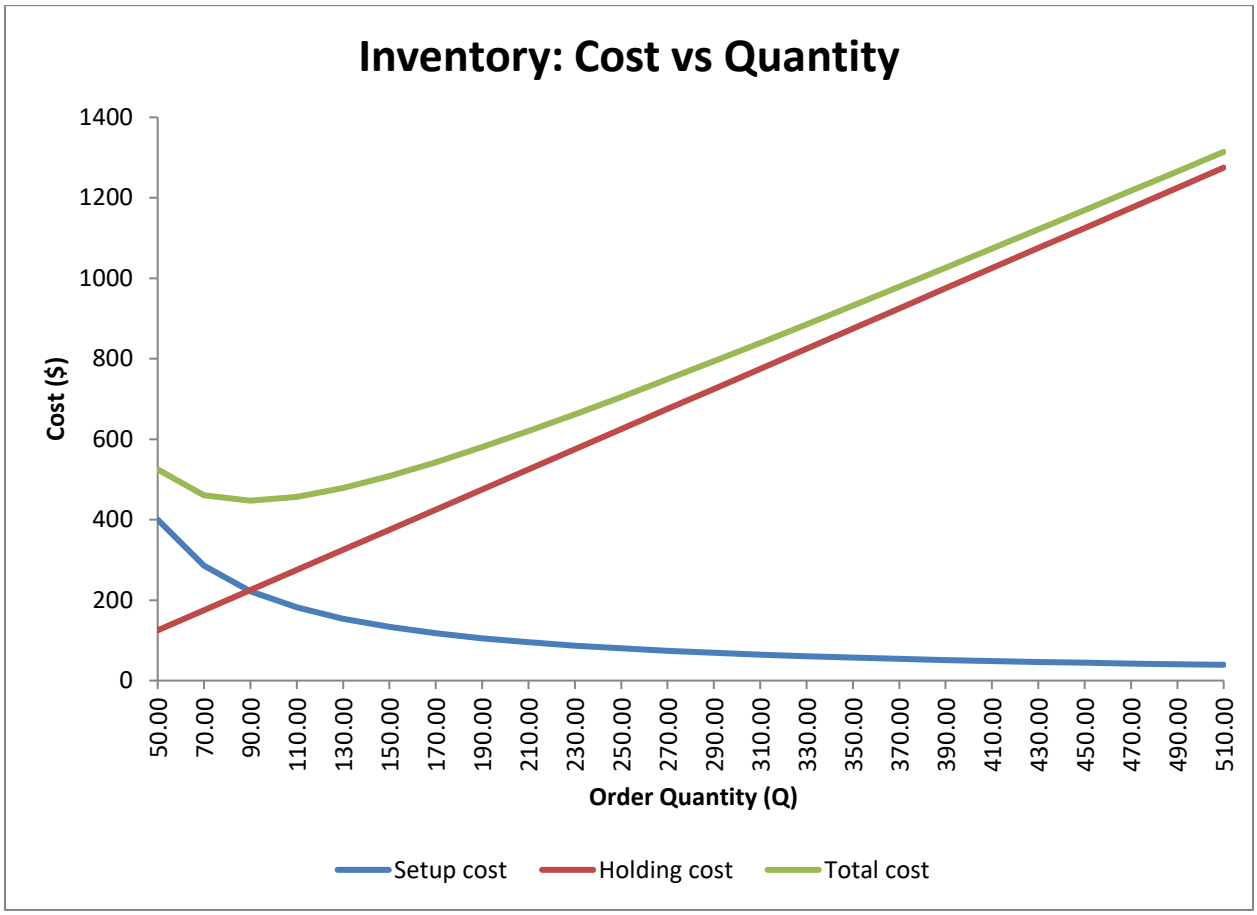
In order to ensure efficient inventory management, we also calculated the safety stock required for each distribution center to fulfill service levels of 90%, 95%, and 99%. The safety stock values for each center are as follows:

	Victoria	Vancouver	Kamloops	Calgary	Edmonton	Regina
Safety stock@90%	**55279**	**114383**	**15299**	**89164**	**59663**	**45986**
Safety stock@95%	**70950**	**146809**	**19635**	**114441**	**76577**	**59022**
Safety stock@99%	**100346**	**207634**	**27771**	**161856**	**108305**	**83476**
Reorder point	**141542**	**292877**	**39172**	**228310**	**152772**	**117749**

It is important to note that the total forecasted demand for the factory is 99,655,324 units, with the Vancouver warehouse expected to receive 75,041,835 units, the Calgary warehouse expected to receive 39,532,356 units, the Edmonton distribution center expected to receive 12,104,136 units, the Kamloops distribution center expected to receive 6,207,050 units, the Regina distribution center expected to receive 9,329,270 units, the Victoria distribution center expected to receive 22,428,255 units, the Calgary distribution center expected to receive 18,088,964 units, and the Vancouver distribution center expected to receive 46,408,622 units.

These findings can be used to optimize inventory management strategies and minimize costs while ensuring efficient supply chain operations.

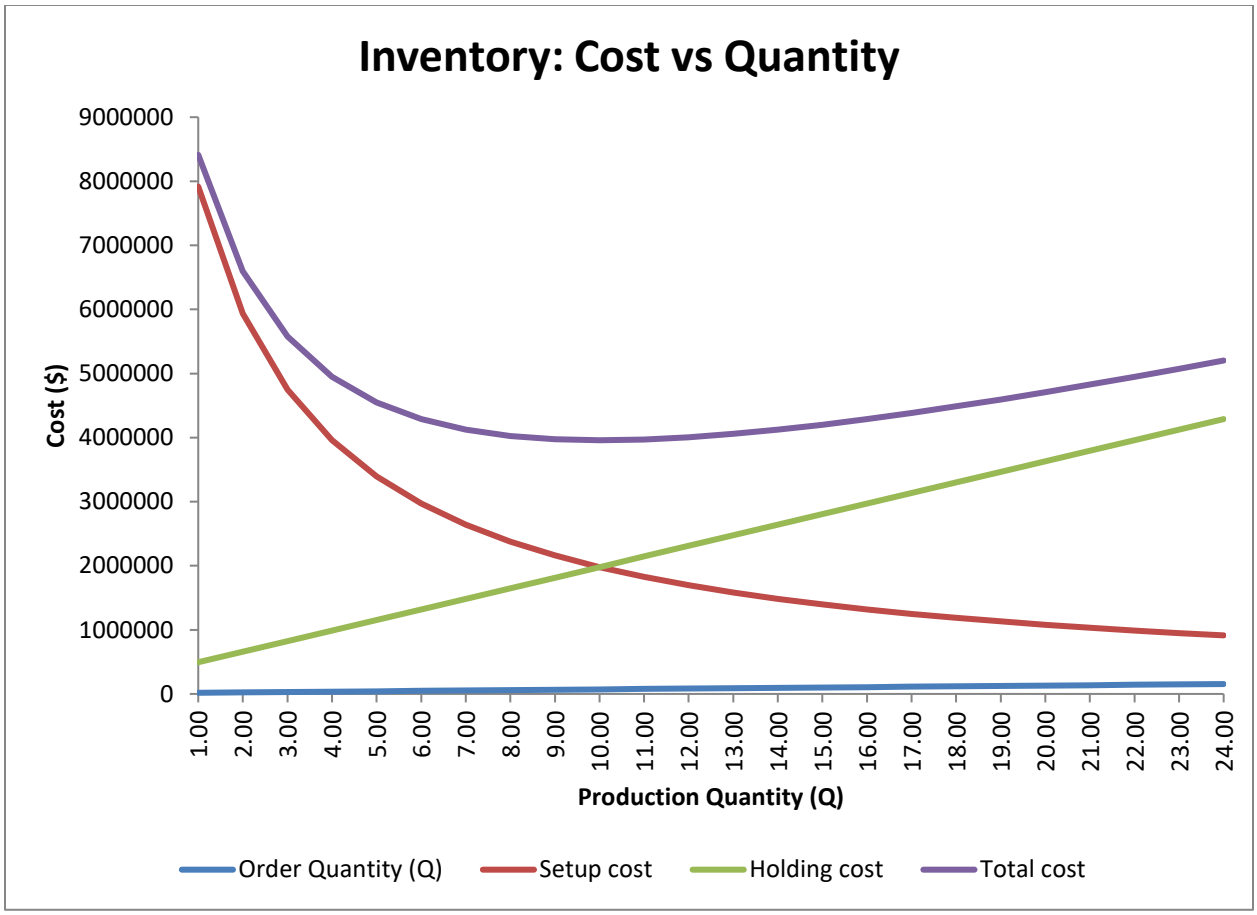
A. Graph EOQ



The graph shows the relationship between the order quantity (Q) and the total cost associated with each order quantity. As the order quantity increases, the setup cost decreases, but the holding cost increases. The total cost is the sum of the setup cost and holding cost. As we can see, the total cost starts to decrease initially with the increase in the order quantity, and then it reaches a minimum point at around 3144 units (From the calculation). After that point, the total cost starts increasing again with the increase in order quantity. The optimal order quantity is the one that minimizes the total cost, which in this case is around 3144 units.

This graph is useful for businesses to determine the optimal order quantity that minimizes the total cost and maximizes the profit. By analyzing the graph, businesses can identify the trade-off between the setup cost and the holding cost and make informed decisions on the order quantity to minimize the overall cost.

B. Graph EPQ



As can be seen from the graph, the total cost initially decreases as the order quantity increases due to the reduction in the setup cost. However, the holding cost starts to increase with the order quantity, resulting in an increase in the total cost. There is a point where the setup cost and holding cost intersect, after which the total cost starts to increase rapidly as the order quantity increases. This point is known as the economic order quantity (EOQ) and is the optimal order quantity that minimizes the total cost of production. From the given table, the EOQ can be

estimated to be around 71,085 units, which corresponds to the minimum total cost of approximately $3.958 million. Any order quantity above or below the EOQ results in higher total costs due to increased holding or setup costs, respectively. Thus, it is important for businesses to identify the EOQ to optimize their production and inventory management.

V. Conclusion

BC Premium Seafood is facing several challenges related to demand forecasting and inventory management. To improve these processes, the company should adopt a coordinated forecasting approach along the supply chain and implement a JIT inventory management approach. These recommendations will help reduce operational costs, minimize the risk of stockouts, and improve customer satisfaction.

VI. Supporting Excel Spreadsheet

The attached Excel spreadsheet provides a demand forecasting model using the moving average and exponential smoothing techniques. The model considers historical sales data and generates a demand forecast for the next 12 months. The spreadsheet also includes a JIT inventory management model that considers production lead times, delivery lead times, and safety stock levels to ensure that inventory levels are optimized.