



QVC Challenge Executive Summary

According to Material, Handling, and Logistics Magazine, e-commerce is growing with 87% of Americans considering shipping speed as a key factor in online purchases. Therefore, in mining 4.8 million rows of cleaned data, we focus on delivery time to help QVC develop an efficient distribution network to penetrate the market.

We evaluate QVC's distribution network by looking at locations of the company's warehouses in relation to those of its customers. Results show that top warehouses are far away from three of the best-selling states. 97% of QVC's sales are handled by four warehouses in the northern part of the East Coast: Lancaster (Pennsylvania), Rocky Mount (North Carolina), Suffolk (Virginia), and Florence (South Carolina). However, California ("CA"), Texas ("TX"), and Florida ("FL"), which are three of the top six best-selling states, are far away from the four warehouses.

The analysis shows that delivery time is strongly correlated with the distance. Therefore, QVC's current distribution network leads to long delivery time to CA, TX, and FL. Through survival analysis of estimated delivery time and customer orders, we find that less than 19% of customers chose to wait for more than seven days to receive their orders.

Among different demographic variables, the population has the strongest correlation to sales amount. On a state level, the highly-populated states tend to sell more. Among the six states with highest sales amount, FL, TX, and CA are under-penetrated as the sales amounts do not match the potential total addressable markets. The major reason is the high percentage of long-distance orders, which come from different states and have high delivery time. Based on penetration and long-distance orders, we focus on addressing the warehouse issues in CA, TX, and FL first.

We also find that customers are sensitive to long delivery time. Customers who have received shipments on time are twice as likely to place another order with QVC than those who have received their packages later than expected. Furthermore, customers have different degrees of sensitivity towards various product categories.

Based on retention rates, long-distance orders, sales amounts, and delivery time, we determine storage strategy for QVC in CA, FL, and TX. We prioritize products that are highly sensitive to delivery time and have longer delivery time. In CA, QVC should locally store products of home decorations, accessories, and health/beauty. In FL, products within health/beauty, home decorations, accessories, and fun/leisure should always be available. The warehouses in TX should store health/beauty, fun/leisure, and accessories.

We recommend QVC to conduct a quarterly analysis of products based on the sales amounts, the sensitivity to delivery time, and long-distance transit to adjust inventory at its warehouses accordingly to minimize delivery time.

Our infographic uses heat maps to clearly visualize the distribution network and customer locations. The flows are directed through different titles with distinct colors. Pie charts, scatter plots, column graphs and trend lines are also utilized to make our analyses and recommendations easy to understand.