

Final Project Report:

Study on QVC's Supply Chain

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1. Background

1.1 Introduction of the Company

QVC, which stands for Quality, Value and Convenience, was founded in 1986 by Joseph M. Segel, selling products during a live TV broadcast (Grant, 2003). With around 30-year transformation, the company has grown into a multinational corporation selling its diverse products all over the world. In addition to TV broadcasting, products can be purchased over the QVC website and mobile App.

In its early growth in the 1980s, the company focused on gaining financial strength and strengthening its position in the TV shopping market through cooperation and acquisition. Besides, it also aimed to improve the reputation of the channel by inviting celebrities as the host. In the early 1990s, the company started to expand the reach of its programming. It provided international broadcasting service in Mexico, Brazil, etc. and joint venture channels in Europe. Two more channels were built in the middle of 1993, which enabled the company to reach more audiences. However, also in this time, the company became worried about the changing nature of television's capabilities. Therefore, in 1996, QVC launched its online shopping site, iQVC and in 2009 the mobile Application. In 2010, QVC.com achieved its highest traffic volume in its 14-year history and the sales on the websites on average accounted for one third of the QVC's orders. In 2015, US Ecommerce company zulily joined the QVC Group, expanding its reach to "millennial moms and the digital-only generation" (QVC Milestones), as well as showing the transformation of the company from a TV shopping channel to an E-commerce retailer.

1.2 SWOT Analysis

Before going deeper into the supply chain of QVC, we did a SWOT analysis on the company to learn about its internal strength and weakness as well as the external opportunities and threats.

For the strength of the company, first, it has widespread retailing platforms including cable TV, website, mobile app, physical store etc. Second, QVC also has international markets such as the US, UK and Asia. Besides, based on the fact sheet published by QVC group, the company has a high market dominance. The TV broadcast channel is watched by more than 360 million households worldwide and 100 million in the US (QVC, 2014). It also has a high consumer experience ranking. QVC was ranked as the first among retailers and eighth overall for customer experience (Temkin, 2017). Finally, the company also formed a reliable distribution network with its long execution.

However, the company also has some weakness. First, although it has formed a reliable distribution network, it does not have its own delivery service. So QVC has to work with other carriers, which cannot ensure the delivery time. Second, one of its employees complained about the high inventory storage of QVC's warehouse ("QVC Employee Reviews for Warehouse Worker", n.d.). It can be inferred that the condition was due to the poor forecasting of customer demand. In addition, some reviewers pointed out that the diverse channels of retailing, like the website, cable TV, etc., make it hard to manage different businesses under QVC (Keenan, 2018).

Then, for opportunities of the company, we believe that the transformation from a TV shopping channel to an ecommerce retailer will bring new customers for the company, especially the younger group with the development of QVC.COM and the mobile App. Furthermore, the use of data and advanced forecasting techniques enables the company to make more accurate estimation as well as to optimize the inventory and distribution networks.

Finally, QVC also faces some threats. One of the biggest threats it faces is the severe competition. As a TV shopping channel, it competes with other channels such as ShopHQ, JTV Live, Create and Craft, etc. (Blake, n.d.). As an Ecommerce retailer, there are already many players in this field such as Amazon or Walmart. These competitions may lead to price wars between similar companies. The second threat was brought by cross platform shopping, which will influence the existing supply chain. For TV broadcasting only, the products and time are fixed and easier to predict while for online shopping, the forecasting becomes much more difficult. The company has to modify the supply chain in order to achieve the desiring service level. Finally, according to some news reports, the transportation cost is increasing these years (Bearth, 2018). Taking amazon as an example, the weight of transportation cost is growing from 2006 to 2018 (Richter, 2019). How to minimize the cost while improving responsiveness is the problem that needs to be solved by the company.

1.3 Existing Supply Chain Strategy and Practice

1.3.1 Facility

QVC's distribution network was operated under the combination of the six main distribution centers and more than 200 warehouses. The distribution centers are located in Lancaster (Pennsylvania), Bethlehem (Pennsylvania), Suffolk (Virginia), Florence (South Carolina), Rocky Mount (North Carolina) and Ontario (California) (Chester, 2016). The distribution centers of QVC are used to store all the merchandise from the manufacturers that are sold on TV broadcasting or online platforms while the warehouses are mainly used for product packaging and cross docking for each order.

1.3.2 Inventory

In order to decrease the lead time and to improve the responsiveness, some warehouses will hold inventory for certain products. For example, QVC.com provides guaranteed delivery before major holidays or events such as Valentine's Day, Christmas and Black Friday. This service required the company to have the ability to forecast the demand in order to modify its inventory. Advanced methods of statistical inventory sampling were adopted to manage the inventory. In manual storage locations, it uses a combination of monthly full recordings of particularly high-valued items as well as quarterly inventory sampling controls using the estimation procedure. In the automatic storage locations, it implemented the sequential testing procedure of inventory sampling on a monthly basis to confirm the accuracy of its inventory records.

1.3.3 Transportation

For QVC's transportation supply chain strategy, the U.S operated inbound transportation system is being studied. Two modes of transportation are used. They are inland trucking and ocean shipping. A detail of this strategy is further analyzed in the analysis section of this case.

1.3.4 Information

QVC's information management system is essential in ensuring the effectiveness and responsiveness of its distribution & Storage centers, inventory management, suppliers' database, transportation of merchandise, and their pricing. Though its marketing and promotion strategies are implemented through TV broadcasting, internet and social media platforms, its internalized supply chain management relies heavily on information coordination among both logistical and cross-functional drivers. This strategy is meant to foster QVC's forecasting accuracy thus ensuring its supply chain goals are realized.

1.3.5 The product sourcing

QVC is primarily a retailer whose products are completely outsourced. Their sourcing methods when dealing with small vendors are very much different than when dealing with big vendors. The bigger the vendor has it easy when getting their products on the QVC shelf, website, or even in brick and mortar. The objective of sourcing is to get your products at the lowest possible price to gain a profit margin by selling at the highest possible price. Which I think QVC works hard to do but struggles when it comes down to open mindedness to open the market up. QVC does have an assortment of products, but the primary bestsellers are HomeGoods and beauty supplies which match their target market.

1.3.6 Pricing

When it comes to pricing QVC prices, they use a very interesting method. QVC takes the fees associated with studio, shipping, and logistics and pushes them down to the customer by making the vendor pay all the outright cost. Then QVC introduces a lot of price saving methods from, as is pricing all the way to, clearance pricing. They have so many assortments of products so pricing will vary based on the product category and the demand of the product but overall, they utilize this structure of fee being passed down to customers and discounts apply to bring equilibrium to the prices.

1.4 Supply Chain Objectives and Challenges

After reviewing the current strategies and practices QVC adopted, we came up with three main objectives of the company as well as the potential challenges for each objective.

First, the company aims at improving the responsiveness for its orders. The challenges however, come from the small number of distribution centers which could lead to a high cost on outbound transportation. Second, it also wants to improve its ability and accuracy in the forecasting. The primary challenge is the selection of appropriate method to manage the inventory. The other challenge comes from the limited data that the company could access. And finally, QVC's third objective is to increase its total

supply chain surplus. The challenge is to expand its market size as well as acquiring new products for the quick transformation of the market.

2. Analysis & Recommendation

The analysis and recommendations part is centered on QVC's supply chain objectives discussed above. In this part, we will evaluate the specific strategies and practices adopted by QVC to achieve each objective, discussing the strengths and weaknesses from the perspective of six drivers in a supply chain. In addition, we did some analysis based on QVC's distribution data in 2018, trying to provide some practical recommendations for the company.

2.1 Improving the responsiveness

2.1.1 Facilities

The locations of QVC's distribution center (purple dots) and warehouses (red dots) are depicted in Figure 1. The heat map shows the total number of orders in each state. The application of large distribution centers enabled the company to take advantage of economies of scale. They are located away from large cities, which decrease the cost of infrastructure and labor. However, the limited number and location of distribution centers of QVC cannot ensure the responsiveness of orders. There was no distribution center in the west coast until 2016 while there are a great number of customers in this area, who may suffer a long lead time for their orders (Nisperos, 2016). With the opening of the new distribution centers in Ontario, California, the lead time for customers on the west coast could be reduced to one to three days, which greatly improved the responsiveness.

Total order count for each state in mainland USA

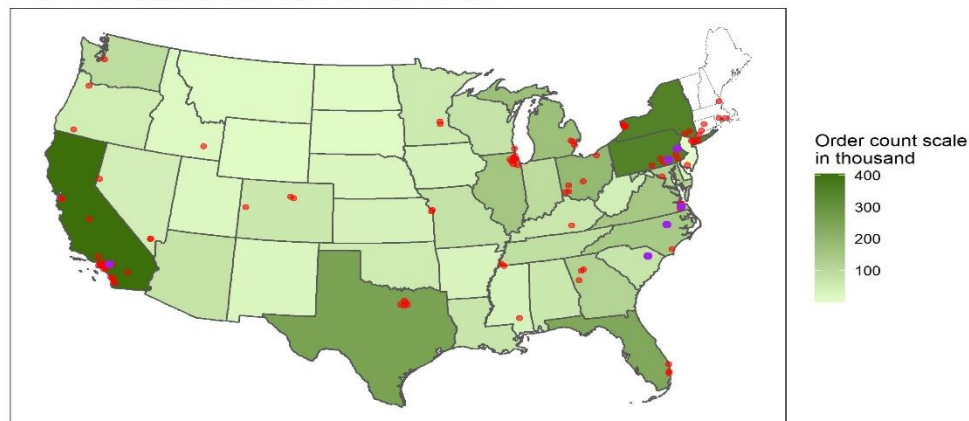


Figure 1

The QVC warehouses are relatively small compared to the distribution centers. They are closer to customers, which can decrease the lead time. In addition, warehouses of QVC served as the cross docking for products from different distribution centers, which provided better customer experience. However,

one problem with this network is that the time period of products from the distribution center to the warehouse might be long because from the figure we can see that some warehouses, especially for those in the middle area are far away from the distribution center. Another problem is about the difficulty of inventory management. If one product is stock-out in one warehouse, to fill the order, the company has to transport the item from the distribution center to the local warehouse, which greatly increases the lead time. Both problems will do harm to the responsiveness of the supply chain. We recommend QVC to upgrade one warehouse in TX to a new distribution center which can hold inventory for orders from the middle US. This transformation was done before by QVC for the distribution center in Bethlehem, Pennsylvania which was originally a warehouse in 2018 (Harris, 2019). So we believe that is practical for the company to make the similar upgrading. For inventory management, we will discuss it in the 2.2 section.

2.1.2 Transportation

Though QVC has global operations, the U.S inbound transportation system is being discussed in this case to demonstrate how transportation drivers contribute to its supply chain responsiveness. Its modes of transport are only inland trucking and ocean shipping. It supports deliveries that serve about 1100 active vendors with open purchase orders (POs), and 100 million units of products annually through three types of freight policy terms. These terms are described as:

- a) Prepaid - Delivered Duty Paid (DDP) or Delivered at Place (DAP): Refers to vendor managed transportation
- b) Domestic Collect (FCA): Relates to QVC's managed domestic transportation
- c) Import Collect (FOB): It is international transportation managed by QVC

For vendor to be served through either of these methods, their order freight terms must first be negotiated with buying office before shipments

The shipments of orders are processed and made in two categories of freight productions, namely a) International (Oversea) production and b) Domestic production freight.

Vendor uses all three of the freight term policies for international production as DDP, FCA, and FOB, while only DDP and FCA are used for domestic production.

These different delivery terms and payments also affect the merchandise pricing.

To increase responsiveness in its delivery functions, QVC will need to include air freight transportation to the current inland and ocean ship.

2.1.3 Data Analysis on Shipping Time

One of our main focuses during our analysis was to focus on shipping time. From an article on customer online purchasing by Dotcom Distribution, it was mentioned that order shipping time as an important factor in ordering online and it was discovered that 87% of customers that shop online have this view (STUDY: DELIVERY TIME INFLUENCES 87 PERCENT OF ONLINE SHOPPERS' PURCHASE DECISIONS 2017). Based on this finding we focused this part of our research to find areas

in the supply chain of QVC that their improvement could lead to reduction in processing time and shipping time for customer orders.

During our exploratory analysis we discovered a product (361200001) product that had longer than average processing time. This product was under the Home Décor category and upon further analysis we discovered that this product is only stored in a warehouse in Maple Heights, Ohio. This product has an average processing time of around 34 days the overall average process time is 3.5 days. The average shipping time for this product is approximately 4 days which is close to the overall average shipping time of 3.8 days.

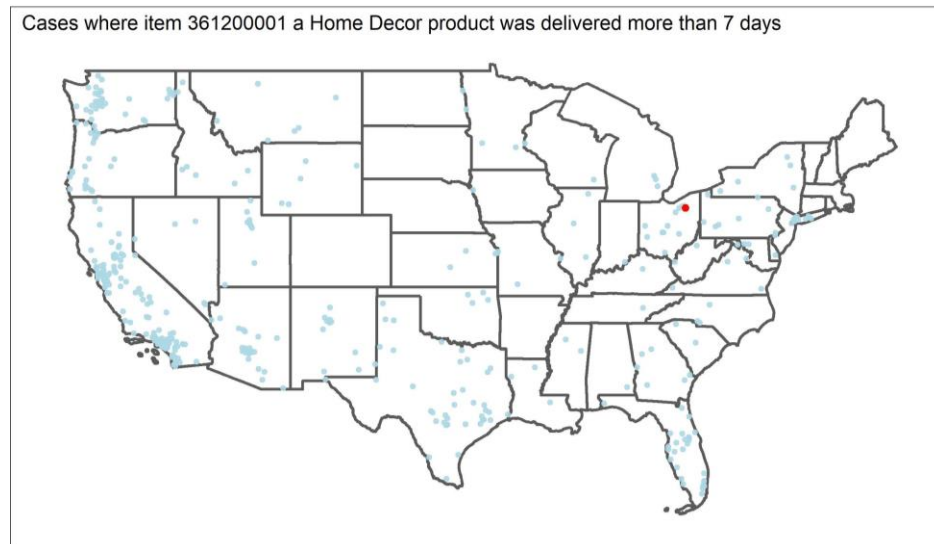


Figure 2

Figure 2 shows customers that have received their orders longer than 7 days. The red dot indicated the warehouse this product is stored at. As shown above customers in the western United States, mainly California state, are the individuals most affected by the long shipping times.

There are two weaknesses discovered after analyzing this product, first is the long processing time by QVC to ship this product and second is the long shipping times for customers that are mainly in the west coast.

Our first recommendation is to implement procedures to lower the time that takes to prep this item for shipping. Since not enough data was provided about this product's specifications or what procedures QVC follows to fulfill this order, we were unable to establish a recommendation based on the process time analysis.

To decrease the shipping time and potentially retain customers, we recommend that QVC implement inventory of this product in its warehouse and or distribution center in California. By maintaining inventory in the west coast, QVC's western United States distribution center can operate to fulfill customer orders in this region. With demand levels available for western region, QVC could implement models for calculating cycle inventory levels for this product and utilize warehouses it owns in California to maintain a supply of this product.

Bestselling products (or categories) for the 6 DC that have long Process time

To better understand what products in each of the six major distribution centers of QVC, we analyzed what are the products they are fulfilling from each of these distribution centers that face a long processing time. For this analysis we set the threshold for orders that had a process time of two weeks or longer and looked at what were the top five most sold items that fell into this threshold.

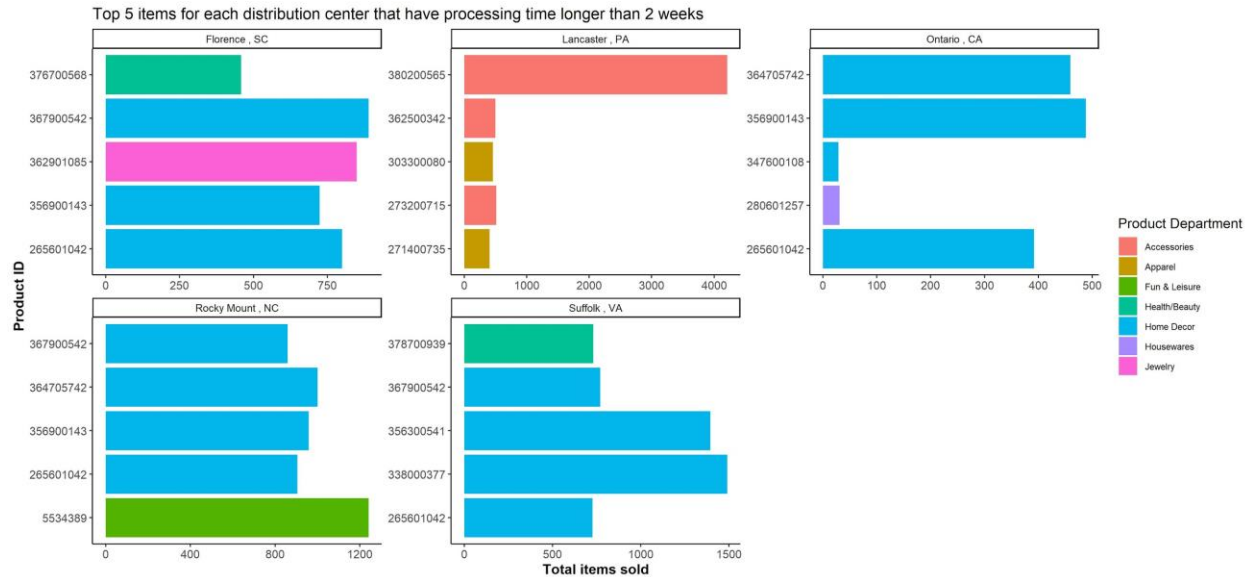


Figure 3

Figure 3 shows the mentioned products for each of the five distribution centers, no records from Bethlehem, PA distribution center met the two-week processing time criteria therefore it's not shown here. The graph shows that most of the products that are facing longer fulfillment times are in the home décor category. Studying the data set we discovered that Lancaster, PA distribution center fulfills mostly Apparel and Accessory orders.

Average shipping time for each state

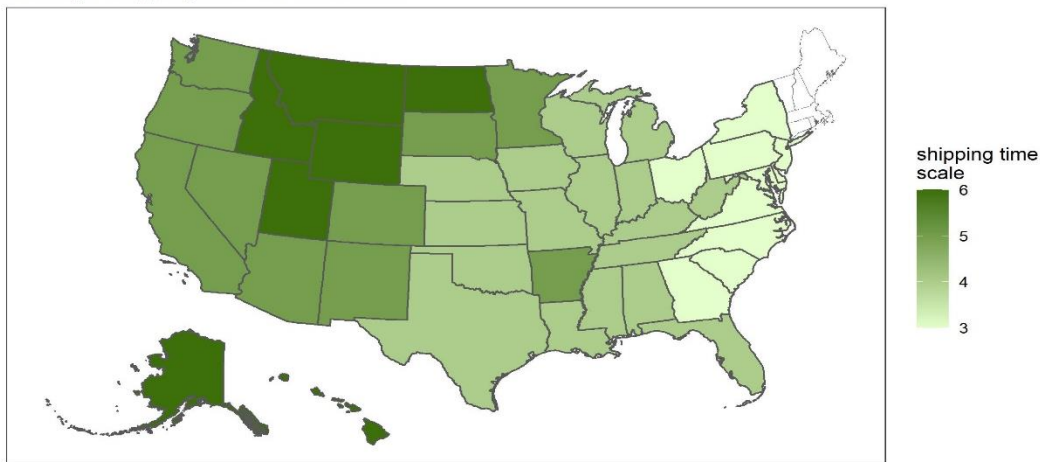


Figure 4

This graph shows one of QVC's weaknesses regarding fulfilling orders that fall under the home décor category. The delay in fulfilment can be contributed to the location of the warehouses that these products are being stored at. QVC could reduce the number of orders that fall within the long process time by optimizing the storage locations to better respond to customer orders for example the mentioned Home Decor products should have closer storage to distribution centers to reduce the processing time.

Figure 4 shows the average time for shipping to each state, as depicted by the lower shipping times in the east coast since QVC has most of its major distribution centers there, and higher shipping times in the mountain region. Alaska and Hawaii also have longer shipping times, but this is expected since they are not in the mainland US and for this study, we focused on the states in the mainland US.

Current weakness of QVC supply chain is order fulfillment of customers in the west coast, as mentioned in Figure 2, majority of delays for customer orders are for customers in west coast, our recommendation is to strengthen the west coast distribution so there is less reliance on order fulfillment for west coast and mountain region customers on the distribution centers in the east coast.

2.2 Improving forecasting accuracy

2.2.1 Information

Reference to the class lecture and, the six drivers of inventory are integrated into logistical drivers (facility-DCs, Inventory, transportation) and cross-functional drivers (Information, Sourcing & Pricing). For this case reporting, QVC's information flow is cross-cutting with these drivers as explained in the data analysis section of this report. For the transportation of merchandise, QVC relied heavily on the use of vendor portal instead of electronic data interchange (EDI)

Additionally, the establishment of a centralized Global Business Services (GBS) center in Krakow, Poland for QVC was released in October 2016 for the purpose of maintaining its competitive edge in a dynamic and global retail marketplace by increasing operational efficiency and establishing world-class global business practices (QVC Press Release, 2016). The GBS centralizes critical processes and services in areas of the company's finance, human resources (HR), information technology (IT), and legal functions for operations in the U.S., UK, Germany, Italy and at the Krakow GBS in France with an estimated saving of USD \$11 to \$12 million annually. Eventually the GBS helps QVC in reducing its supply chain bullwhip effects.

To address a major weakness of suppliers and major buyers information access, QVC must improve on its vendor information management system by adapting EDI system than just Vendor login portal so as to create convenience and expanded access for clients.

2.2.2 Inventory

One of the main purposes for QVC to collect information is for the inventory management in warehouses. As discussed in the background, an advanced forecasting method was adopted to estimate the demand and modify the inventory accordingly. For general products, it referenced the quarterly sales data

while for the high value products, it referenced the monthly sales data, through which the model can reduce the variance of the forecasting results, thus increasing the overall accuracy. However, the weakness for QVC's forecasting practice is that each warehouse made the forecasting separately, which resulted in a relatively large safety inventory. However, if multiple warehouses could do aggregated inventory management, the accuracy of forecasting could be higher and the safety inventory could be reduced compared with managing the inventory separately. One practical recommendation for QVC is to do aggregated inventory management for nearby warehouses. From Figure 1 we can see that many warehouses are located close to each other. The company can utilize aggregation to make more accurate forecasting and to reduce the safety inventory, which also helps reduce the cost.

2.2.3 Data Analysis on Bullwhip potential

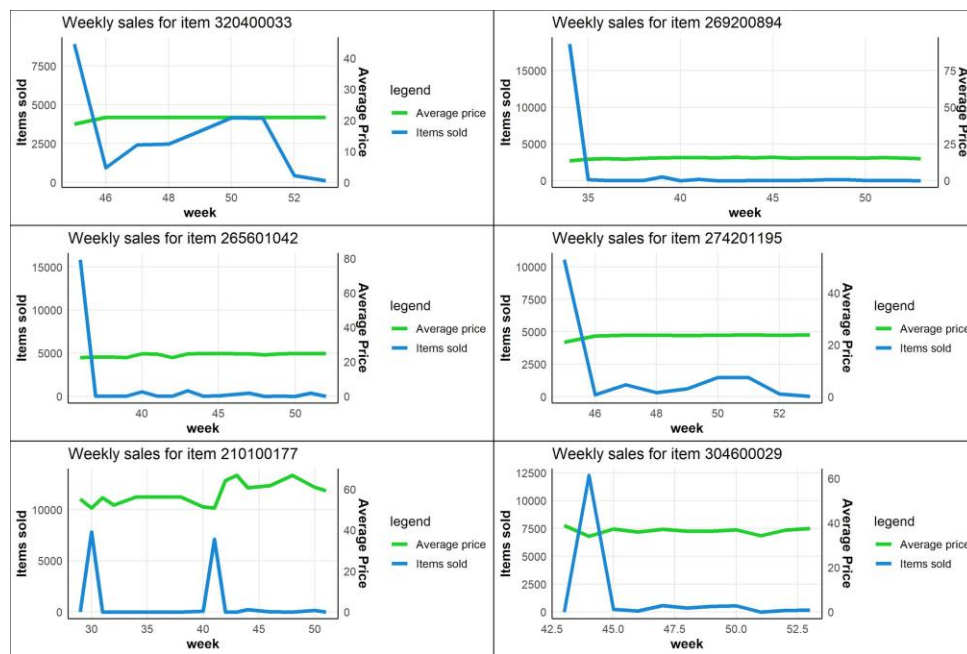


Figure 5

To study any potential indicators of bullwhip effect we analyzed the total products sold per week and averaged the price of that product during that week to discover any correlation between price discounts and products ordered. The Figure 5 shows the total items sold and their respective average price per week for the top six most selling products based on the data we used for this study.

Price discounts could lead to larger purchases by customers, but this does not indicate the demand over time but customers taking advantage of lower price to purchase the products (Lee, et al., 1997), as can be seen from the graphs above when the average price of the product was low during that week QVC had higher sales for that product in most cases. For example, product 210100177 saw two sharp increases during the periods that average price was low. By implementing information sharing across different stages of the supply chain manufacturers would be aware of the possible upcoming sales and the reduced

ambiguity in the supply chain would allow all levels operate in sync with each other even with major fluctuations in orders in retail level.

2.3 Improve the profit

2.3.1 Sourcing and Products

QVC is a retail product distributor that has multiple ways of marketing their product to the customer, such as television, E-Commerce, and brick and mortar. Their primarily focusing is selling their products to the customer and not manufacturing means that a lot of their products are outsourced. There is a procurement process that individual manufacturers and large manufacturers must go through to be accepted into the QVC product line. When small vendors are looking to sell their products on QVC, there are some things that QVC looks for. Your product must hit its target market, which target market is women between the ages of 35 and 64. This is about 52% of their sales, and their target range is specific for people with disposable income. They look for vendors with a product that has a unique story, cannot be found anywhere else, and demonstrable this is just a few. QVC has a particular product line it focuses on, some of which are listed in the Table 1 below.

Categories QVC Is Interested In:	Categories QVC will NOT accept:
Women's Apparel/ Accessories	Feminine/ Personal Hygiene
Bakeware and Cookware	Firearms
Beauty	Fuel additives
Bed and Bath	Gambling-related Products
Consumer Electronics	Genuine Furs

Table 1

Outsourcing products from different manufacturers allows QVC to lower the cost of production and increase the profit margin when selling these products at the market. QVC also outsources their transportation and shipping, as previously stated in earlier paragraphs, which talks about transportation efficiency and responsiveness. In response to the recent pandemic CoVid19, small vendors have been forced to pause operations. Their response to this was that they are working with their vendors to rapidly adjust inventories to stay in stock on Home, Health, and Food items where demand has grown. This will likely create some mix-driven margin and inventory pressures.

My recommendation to continue to increase sales is to allow for the smaller vendors to get access quicker to the QVC platforms. They can do this by speeding up the application process and selection of new vendors. Smaller vendors bring unique products that continue to increase their niche and would bring in more sales. This will increase revenue and overall profits. QVC Global sales mix is provided in Table 2 below the top two are highlighted in yellow.

Product category	Year 1	Year 2	Year 3
Home	38%	34%	33%
Beauty	18%	17%	17%
Apparel	16%	19%	19%
Accessories	11%	13%	13%
Electronics	11%	9%	9%
Jewelry	6%	8%	9%
Total	100%	100%	100%

Table 2

2.3.2 Pricing

When it comes to QVC and pricing, a few factors come into play. The first factors are the cost of doing business with QVC. Which is passed on to the customer. This includes all of the logistics and production fees that occur when selling that product. Some of these are shipping costs, which QVC only buys an inventory of 35,000 plus, production of studio fees, and celebrity guests, and more fees. These fees are pushed onto the vendors, which consequently, based on the pricing model, causes the item to go up. The cost per item is raised by the vendor, then the price increases as it is passed down to the customer. QVC also uses different sales techniques to price their items at a reasonable competitive price. Some of them are labeled in the table 3 below. Pricing, Retail Value, Offers & Other Information

“As Is” Price	Buy More, Save More	Featured Price	Manufacturer's Suggested Retail Price
Advance Order Price	Clearance Price	If Purchased Separately Price	On-Air Testimonials
Black Friday Beauty iQ Steal	Clearance Sale Price	Last Chance Price	One Day Only Price®

Table 3

Just to emphasize some of the pricing models, the primetime special is every night from 8 to midnight, at this time, they will sell items at a lower price to increase their sales. They also offer clearance pricing, which we are all familiar with, which allows them to get rid of old inventory at a lower price to recuperate costs. After evaluating their pricing model, I recommend that they find thrift shops and sell items not sold to recuperate costs.

3. Conclusion

To briefly conclude, in this study, we investigated the supply chain strategies and practices of QVC company. Based on the six drivers in a supply chain, we discussed the strength and weakness for QVC in achieving the three main objectives: a) Improving responsiveness b) Improving forecasting accuracy and c) Increase total surplus, along with some general recommendations. Some data analysis were done and more practical recommendations were added for the company.

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