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DEVELOPING A SUPPLY CHAIN FRAMEWORK FOR OMNI-CHANNEL PRESENCE

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ABSTRACT

The issue this thesis focuses on is how to develop an omni-channel presence for Company X, a high-end jewelry company, which means that each channel of distribution the company operates will act as one single channel. Many companies have investigated omni-channel supply chains to become more efficient and to better satisfy their customers' needs. Companies like Amazon have increased customer expectations with their fast delivery capabilities and the emergence of e-commerce has made the supply chains for more channels of distribution complex, so omni-channel has become an influential method to improve the customer experience. While there is not extensive research on how to specifically address the supply chains of omni-channel companies due to companies often having very different supply chains to deliver their product or services, this thesis develops a framework for Company X to utilize.

The research first began with a site tour of Company X's distribution center. The tour provided details on the company's practices and an opportunity to hear from numerous employees about Company X's history, challenges, and supply chain. With that foundation, secondary research was gathered from many different resources to help understand the history of omni-channel, find examples of companies successfully implementing omni-channel and best practices, and analyze which changes Company X should make in order to develop it. Sears is the company used as a model for Company X's changes.

Based off the analysis of Company X's current supply chain, numerous recommendations for supply chain changes were provided, some small and some more significant. The first main change recommend starts with inventory planning, because it is a step early on in the supply

chain process and since omni-channel cannot be successful without one inventory plan. The supply chain cannot operate as if it is one channel if each channel is independently planned. The next recommendation is to change the inventory picking method to one pool of inventory and deviate from its method of reserving inventory. Company X should instead incorporate rules of intelligent sharing to allow for picks amongst different channels in the case of under or over forecasting. In addition, although Company X already has a date for implementing new technologies, it is recommended that their technology support a transparent view of inventory across all channels so that online orders constantly check product from the optimal location, even if that is not at the distribution center. Finally, the last main recommendation is that Company X makes their distribution center store-facing to provide customers with the ability to choose whether they want an item shipped or if they would like to pick up an item at a store or distribution center.

TABLE OF CONTENTS

LIST OF FIGURES	iii
ACKNOWLEDGEMENTS	iv
INTRODUCTION	1
BACKGROUND	4
Omni-Channel Overview	4
Industry	5
Company X	8
BEST PRACTICES	11
ANALYSIS.....	15
Assortment	15
Inventory Planning	16
Picking Process	16
Delivery.....	19
Capturing Online Orders.....	20
Technology.....	22
CONCLUSION.....	25
BIBLIOGRAPHY.....	27

LIST OF FIGURES

Figure 1- U.S. Concentration of Jewelry Establishments7
Figure 2- Sears “Cheetah Network” Map with Shipping Times12

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INTRODUCTION

With the growing pervasiveness and advancement of technology, fulfillment of a retailer's products through omni-channel is crucial to having a successful supply chain and satisfying customers' needs. Despite multichannel retailing and omni-channel both utilizing more than one channel of distribution, the difference between the two is important. In the *Global Conference on Business and Finance Proceedings Volume 1, Number 1*, the authors differentiate between the two when they explain "...it is clear that the Omnichannel concept involves the integration of various channels in order to serve the customers in a customized fashion through their channel of choice" (Frazer & Stiehler, 2014). While both concepts do indeed have multiple touch points for customers, the difference lies in how the business fulfills these products to the customer and their experience of that result.

The days of mom-and-pop shops selling through a single avenue are more or less gone, and companies now sell through multiple channels in an integrated way in order to grow and be successful. Omni-channel can improve the product delivery and experience for customers, especially when they have expectations as to the timeline of receiving products. Therefore, a shift to omni-channel is desirable for many companies including Company X, a high-end jewelry manufacturer that shall be the focus of this research.

For successful omni-channel, companies have to have the right supply chain processes. Internet sales, however, have not only made it challenging for companies to change the way they manage their supply chain from never having to plan for internet sales before e-commerce existed, but they also have to meet the rising expectations of customers due to consumer empowerment.

Companies such as Amazon, that can deliver to Amazon Prime members in two days or even thirty minutes at some urban locations, have driven other companies to strive for better service. Although this type of fast delivery works for Amazon and they are capable of doing so, this does not have to be the goal or method of the supply chain for every company. How a company goes to market is different for every company because every company is set up differently due to things such as product type, geography, and customer and supplier locations. Companies may not always need to deliver product as quickly as the way that Amazon does, but the Amazon example serves well to delineate how rapidly business can change with the introduction of e-commerce.

If a company needs to serve customers through multiple channels they will find a way to do so, but to do so presents challenges. Each company must plan for how many products to sell and through which channel. However, to satisfy customers they need to plan well in order to ensure there are no stock-outs or late deliveries. E-commerce, although emerging, cannot fall to the wayside and be fulfilled merely through whatever stock is left, but must be actively planned for in order to ensure all customers are getting the product they want when it is promised. Especially if a company wants to increase international sales, Internet sales must be integrated to meet these needs and allow room to grow in the future.

While the processes to deliver to the customer should be continuously refined and improved, there are best practices for how to create an omni-channel system versus merely a multi-channel system. The purpose of this thesis is to develop Company X's omni-channel presence based on the evaluation of their current practices and making recommendations for successfully integrating the omni-channel strategy into their operations.

The remainder of this thesis is structured in sections. The first section provides a background on omni-channel, the jewelry manufacturing industry, and Company X. Next, the best practices of Sears will be analyzed to determine what tactics they use to develop their omni-channel presence. Finally, an analysis of the company's current practices and framework for what Company X should be doing to develop omni-channel will conclude this thesis.

BACKGROUND

Omni-Channel Overview

Richard Sears, founder of Sears, was the first person to begin selling product in more than one channel. After selling watches in 1866, he then developed a catalog in 1896 and then in 1925 sold through a traditional retail location in Chicago. Allowing customers to purchase through multiple channels was novel then, but nowadays it is commonplace especially with development of the Internet and online sales. The extent of multi-channel selling has given way to the exploration of omni-channel, where companies sell products through multiple channels but operate as if it is through a single channel. Omni-channel is a multi-faceted concept, with three main parts: (Dr. John Coyle's *Distribution and Omni-Channel Network Design* endnote).

First, omni-channel strategy must align with the firm's "go to market" strategy which dictates how consumers will be able to gain access to the firm's products. Second, the fulfillment processes must be integrated regardless of order entry point. In other words, whether the order is a purchase at a store or is placed through a Web site, the replenishment/fulfillment processes must be integrated to provide rapid and consistent delivery. Finally, "ease of shopping" for the consumer is a priority regardless of where or how the order is placed. (Coyle, et. al., 2013)

These different facets of omni-channel are important because certain parts of it have already been more heavily researched than others, such as the marketing aspect described in the third point above. In business, there are the physical channels and the transactional marketing-related channels. This research has found that most literature addresses the methods used to implement

omni-channel when it comes to marketing. “Further retailers should be able to improve the seamless shopping experience by approaching their Omnichannel strategies from an experiential marketing perspective” (Frazer & Stiehler, 2014). Providing a smooth customer experience no matter which way they order, be it in the store, online, or on mobile devices relates more to the right marketing and store website experience. While these aspects are all important, the current research does not give much insight into the logistics situation. Kodak Alaris, in *Industrial Distribution*, gives three apparently “practical answers” to how to become omni-channel: understanding unstructured information, unifying information silos, and getting better with time (Alaris, 2015). Yet even these answers do not really serve as a solutions manual for how to make the necessary changes in order to implement omni-channel. A company might know that it has communication challenges, yet not know how to fix them. It is also easy to say “learn from your mistakes” but that does not help the back-end supply chain. It is more challenging and difficult to find sufficient literature on the back end, or fulfillment, of omni-channel. However, some companies exist as models that can be evaluated and help demonstrate what good omni-channel management looks like, such as Sears, which this research will go into more depth later. This thesis will develop a framework for omni-channel presence, but first will describe an overview of the industry landscape and Company X’s background.

Industry

High-end jewelry is a small industry that maintains high mark-ups on its products. By 2020, sales in the industry are anticipated to surpass \$285 billion with the United States, China, and India driving the leading markets. Companies in this market have small store footprints due to the small, but high value, products. The product array can vary greatly, from solely precious metals to semi-precious gemstones, precious gemstones or any combination. Creativity and

current trends and fashions are a significant factor in the products available. Even wearable technology, such as the Fitbit, has been a trend where the product becomes more stylish looking while still maintaining its core function of tracking the number of steps someone walks in a day.

However, according to Hoover's, a business intelligence database, the industry has medium growth potential but is an industry dependent on the health of the economy and "needs efficient operations and cost controls." Due to the highly valued products, companies generate profits often despite operating inefficiently. Walmart is an interesting comparison to this industry, because it operates very differently from jewelry manufacturers. According to *Foreign Policy* in "Give Sam Walton the Nobel Prize," it relies on extremely lean and efficient operations on products with low margins, yet it is the world's largest retailer. Walmart has the volume for products, unlike jewelry manufacturers, that can reduce manufacturing, procurement, and shipping costs. They have such a vast buying supremacy that they even reduce suppliers' profit margins (Kenny, 2013). The high-end jewelry market, though, often operates uneconomically due to its susceptibility to creative, artistic changes and volatile changes in raw material prices. For example, gold is a central raw material involved in jewelry manufacturing that historically has been very susceptible to price volatility. Economic conditions, as previously mentioned, also influence how well the market fares. When the economy is in a deteriorating condition, sales fall since fine jewelry is often a luxury that consumers avoid in difficult financial times. According to IBISWorld, an industry market research database which analyzed data from the U.S. Census Bureau's County Business Patterns report, the Mid-Atlantic, West, and New England regions are the most highly concentrated for jewelry establishments (see Figure 1).

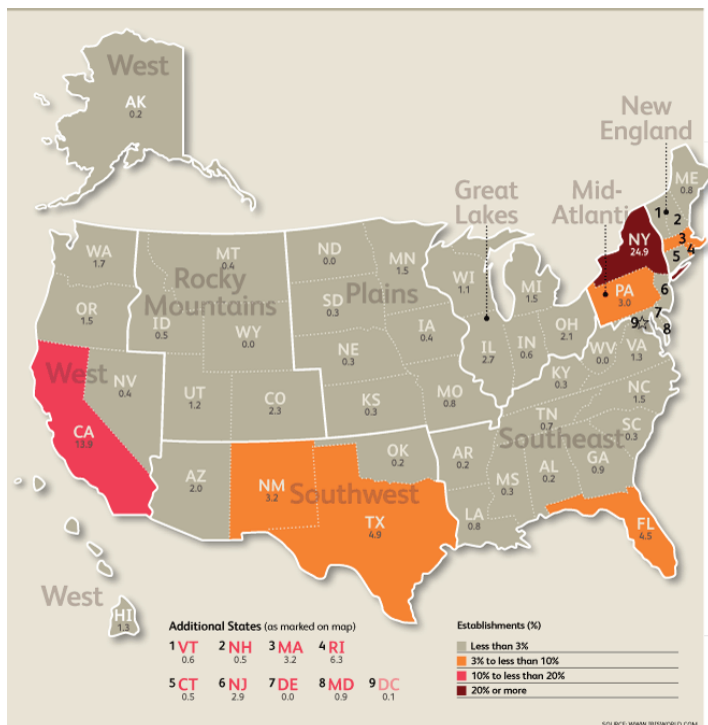


Figure 1- U.S. Concentration of Jewelry Establishments

Manufacturers are in part located here because some of these states have the highest income per capita or are expected to have households with some of the highest incomes. By placing business here, the manufacturers are closer to the customers that are likely to pay for high-end jewelry even in times of a poorer financial economy, which is an important strategy for this market. These locations can also increase responsiveness to customers, are closer to ports for imported components, shortens delivery time, and can decrease transportation costs (Haider, 2016).

While this industry faces many challenges such as price volatility of materials, the influence of economic health, and inefficient operations, an overview of Company X will provide more insight into the specific difficulties they face. Company X's background and a description of their current methods will help set the foundation for a framework to develop their omni-channel presence.

Company X

Company X is worth analyzing because they are a growing company, becoming increasingly successful with their jewelry selection. Despite their accomplishments, their supply chain operations often suffer from inefficiencies that could deter future growth. Omni-channel fulfilment could improve their practices not only for a better supply chain, but also for a better overall customer experience. A general overview of Company X will be discussed as well as the challenges that their business faces.

Company X, like much of the industry, suffers from creative whims that have caused inefficiencies. It is a privately owned company, where the owner also acts as an artist designing the jewelry products. The company has about forty of its own stores, and although a few of those stores are in Canada the company does not have significant international sales. They have one distribution center located in the United States, to serve all channels, which is about 25,000 square feet. Company X now has about 7,000 stock keeping units (SKUs), which is the lowest level of inventory, classified under three different styles: foundation, core and new which they sell across wholesale, retail and e-commerce channels. About thirty-five percent of the product sales is from new product, fifty to fifty-five percent is core product, and the rest is foundation sales. The new and foundation styles are made-to-order, while the core styles are based on a twelve-month forecast. Since core is the only style forecasted, less supply chain issues arise than with the made-to-order ones. Each of these styles is sold in three main markets: a March market for summer and fall deliveries, a September market for January and February deliveries, and a Las Vegas market for a few days in June for October and November deliveries. These markets represent the main selling times for the company. Up until about ten years ago, the company kept every product for sale, which means they owned high levels of inventory. It was difficult to

forecast accurately for new pieces, and they even had close to fifty-seven thousand styles. This many styles became challenging for supply chain to forecast, since the more SKUs available the less accurate a forecast becomes. Since SKU proliferation was difficult to forecast, they began decreasing what styles were available. For example, core alone went from about 18,000 styles to 700 styles.

Most relevant to omni-channel, however, is how the company has historically handled e-commerce and how they currently operate. Company X only entered into the e-commerce business about five or six years ago and worked with an outside company to distribute their online sales. The outside company held and set up Company X's site, had a call center, and distributed the product for online sales. Company X found that while e-commerce had the opportunity to grow, it was not being serviced well enough. About one year ago, Company X took over this channel in order to have more control of the customer's experience and product availability. This decision was a crucial step towards omni-channel fulfillment, since each channel must operate as one; having a third party operate one of Company X's channels would have made omni-channel unmanageable. The effect was almost immediate. Unit sales increased thirty percent this year over the last year. Further details on Company X's ecommerce will be discussed in the "Analysis" section of this thesis.

Recurring issues for Company X are echoed by that of the industry, however, and are difficult to control or improve. Fashion-related industries have quick timelines, but the market is susceptible to frequent changes. Often last minute changes are made to styles of jewelry, such as the shade of a gem stone or the width of a silver band. While these changes are made for artistic purposes and are aimed at pleasing the customer, it can cause disruptions in supply chain planning. Also, since the owner takes part in designing the jewelry, sometimes the deadlines

jewelry should be created by are not met. Striking the balance between creativity and business efficiency is problematic for Company X. Similarly, the customer base requests new styles more than the other options, yet those are the most difficult to deliver on-time and are more expensive for the vendor to manufacture. Components have long lead times because they are sourced and ordered before the product has actually been sold, so the bullwhip effect of increasing variability upstream drives costs and forecast inaccuracies. Since purchase orders are necessary before a vendor can manufacture anything, Company X takes the risk when ordering product or changing orders. If they under-sell, they have to wait on products which can cause delivery delays. If they over-sell, financial plans and capabilities of operations are affected. In these operations, the company utilizes about three hundred component vendors and forty production vendors. There are many opportunities for variability and therefore inefficiencies across the supply chain. Company X only holds about twenty to thirty percent of inventory in their distribution center and the remainder of the inventory is held by the customers. While that decreases holding costs for the company, customers do not always buy and hold much inventory and sometimes prefer to buy in smaller quantities.

The private ownership and creative market Company X is in creates challenges for the supply chain that cannot all be overcome through omni-channel, but looking at best practices and an analysis of Company X's existing practices later in this thesis will serve as an outline for change that can help buffer the inefficiencies Company X faces.

BEST PRACTICES

Since developing omni-channel is not a one size fits all solution that is the same for each company, it is helpful to look at companies that are omni-channel paradigms to see what is working for them and how those practices can be applied to Company X.

Sears Holdings is a great example with its “Sears cheetah” and Kmart “cheetah” strategy, working with its other program “roadrunner” to implement a seamless omni-channel strategy. After losing market share in part from increasing consumer demands and online shopping, Sears Holdings felt the pressure to change and become more flexible in order to meet customers’ expectations. Bill Hutchison, chief supply chain officer and senior vice president, confessed that the “Amazon Factor,” a reference to Amazon’s increasingly faster delivery promises for online sales and fulfillment requirements, has in part motivated this strategy for Sears.

The “roadrunner” program turns the distribution center network to become store-facing, which allows it to size up or down depending on the volume of local demand. It also helps support online sales, as well. This fulfillment allows customer shipment flexibility, so they can receive their packages through traditional shipping day-of or pick up their purchases in the company parking lot. With “roadrunner” as the foundation for Sears, the omni-channel strategy was then created with one main focus: the customer. Since customers wanted products delivered at their own specified time, sometimes a quick delivery date and sometimes a date weeks away for the customer’s most convenient timing, the company had to be able to fulfill those needs. While previously they had two distribution centers in the Chicago area, to better accommodate customers they transformed their plan to allow any store to work with all other stores across their network.

An important factor in creating this flexibility was working with UPS to determine which store locations were optimized for fulfillment. If Sears could not deliver a product as soon as the customer wanted, then their system would check all other stores' inventory for that same product. This new process was especially important for major buying holidays, such as Christmas and Black Friday, where demand is much higher than usual. The “roadrunner” and “cheetah” strategies allow the company to flex up to sixty percent more for better velocity through additional stores with its store-front distribution centers, which can be turned on or off depending on the demand. The cheetah network can even provide one-day shipping to eighty-one percent of the United States population and is a significant change compared to the time before its implementation (see Figure 2). Other benefits of this omni-channel strategy include reduced safety stock and more product availability, which keeps customers shopping at Sears instead of traveling to other stores or online sites for their shopping.

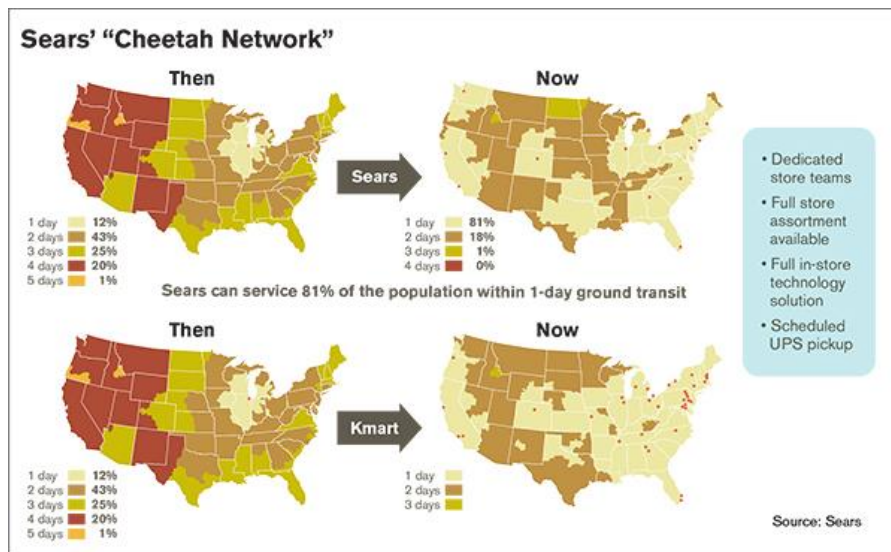


Figure 2- Sears “Cheetah Network” Map with Shipping Times

In order to carry out these operations, employees at every level of the company had to be trained and work with new metrics geared towards the new goal. Also, more than just supply

chain had to get involved in order to make omni-channel successful. Marketing, IT, the store operations, on-line business and other business functions had to all buy in to the program and work together to make omni-channel effective. Technology was also crucial, since each store had to be able to see inventory at other locations and find the optimized locations for product shipments. Technology's significance in omni-channel fulfillment can especially be seen in what Sears' vice president of logistics services, Jeff Starecheski, termed "COOL," the Customer Order Orchestration Layer. "With 'COOL,' we can manage fulfillment promises at the customer level and optimize the fulfillment location of every order for speed or cost, whether from a store or a DC," says Starecheski (Burnson, 2015). Each moving part in the fulfillment strategy is supported by a technology system that enables these flexible operations which yield enhanced customer satisfaction.

While all of these operations seem quite complex, it is crucial that the customer does not notice or feel any of this complexity. It has to be a simple process for the customer no matter which way they shop for a product, be it online or in the stores and Sears does this well. They serve as a useful example for Company X. While their supply chain fulfillment may not be the same, its practices demonstrate some important lessons. First, Sears gives the customers options. If the customer wants to order online and have one-day shipping or if they want to pick up at the store, then they have those choices. Second, Sears utilizes their fulfillment network in unique ways to flex up and down according to the volume of demand. For peak buying seasons, such as Christmas or Black Friday, Sears has the ability to make their DCs store-facing. Ultimately, strategies like "cheetah" and "roadrunner" provide flexibility for the company, which is crucial for an omni-channel presence. In addition, the company has the right technology to support their strategy. In order to optimize inventory at the right locations and be able to check inventory

across the entire network from any location, the technology has to enable these functions.

Finally, a factor that cannot be overlooked is the necessity of buy-in from all business functions.

Omni-channel presence is not built by supply chain alone. It must align goals and collaborate with IT, marketing, and the other functions to be successful. IT enables the technology portion, marketing ensures that only the promises that can be met are conveyed to the customers, and so on for the other functions.

Company X can use these lessons to develop their omni-channel presence. While each strategy may not be applied in exactly the same way for them as it is for Sears, the practices can aid and guide them in achieving their omni-channel strategies and goals.

ANALYSIS

Some might think of omni-channel as merely relating to how e-commerce is handled, but it actually permeates each aspect of a company's supply chain. While omni-channel is relatively simple in theory, since each company operates with a different supply chain, different aspects of Company X's supply chain are included below because omni-channel is a practice that must be tailored to a company. It is not a one size fits all solution, so below are relevant aspects to a supply chain. Each section will begin with a description of Company X's current practice and end with what it must do to progress to omni-channel practices, if the current practices conflict with omni-channel practices.

Assortment

The retail and wholesale channels generally feature the same assortment of products, while e-commerce typically has less available on the online site. Core and new styles are represented online but less foundation is available, while retail and wholesale feature all three styles. This smaller assortment for e-commerce ensures that it is not overwhelmed with sales, since Company X has only recently begun to manage it internally. That step of internally managing e-commerce was an important past step towards omni-channel. The assortment also differs in size depending on how big or small the store is, so the assortment can differ in this way, as well. For omni-channel, different channels may feature different assortments as long as they are picked and handled correctly, which will be discussed in the section called "Picking Process."

Inventory Planning

The way Company X plans inventory is one of its most significant shortcomings in regard to operating as an omni-channel. Currently, retail tries to do their own buys and then Company X has to figure out how much has to be produced based off the retailer's expectations; wholesale operates the same. After wholesale and retail estimate how much and what kinds of products they need, a production number is created by the company. This number is how core is forecasted (a prediction based off order history), and then all other products from foundation and new are made to order. These sales also operate separately from an e-commerce sales plan. This poses a challenge because e-commerce is new for the company, so determining how much inventory to plan for can be challenging. Planning for inventory this way is not effective for omni-channel, because the sales plans are all done independently and information is not visible across departments. In order to plan well for inventory through this method of independent planning, each channel would have to forecast very accurately, which is not the case especially with an unstable market like the jewelry industry. To develop an omni-channel presence, Company X must practice "intelligent sharing" and provide total access to every channel for everything in inventory (Hobkirk, 2016). A final Sales & Operations Plan must be discussed by Company X with shared information across each channel's inventory plan to successfully implement omni-channel.

Picking Process

The picking process is another crucial aspect of omni-channel presence. The channels currently have their own reservation process. E-commerce has its own inventory held in reserve so that their product cannot be sold by other channels and this process is the same for retail. Everything else in inventory is available to any channel in a general pool of inventory. The

picking process is determined by specific channel and type of product. The distribution center has a carousel with a “put to light” system and a bin system. The carousel system works well for products of similar physical characteristics and high value, which works perfectly for jewelry. A worker then has envelopes with the individual orders, and picks from the carousel and puts the orders into the envelope based off the put to light system. The bin system is more of a traditional approach, almost like how a store operates. Products of the same style are stored in bins in a finished goods vault, and then workers pick the product from the bins. The carousel houses most of the core product for all three channels and the conventional bin system in the vault has mostly foundation and new made-to-order products for all channels. For example, the carousel can be used to pick a retail channel and core style product order. If a channel under-bought and has no product it needs left in its reserved inventory, then it can pull from the general pool of product from the bin system but that product is not guaranteed to be available in the general pool.

The first evident issue with Company X’s picking process is the retail double pick. In the picking process, retail gets priority over the other channels since it has the best margins. To ensure that retail gets all the pieces it needs, inventory is moved from one bin to another reserved bin during the day. This double pick decreases efficiency, as more touches equates to more time and labor. However, apart from the double pick concern, Company X’s picking method is not how omni-channel picking is typically done. According to “Warehouse/DC Management: Six Best Practices for Better Inventory” Management in *Logistics Management*, “The key driver for an omni-channel DC is the benefit it has on inventory—having one pool of inventory that can be used more flexibly to accommodate forecast deviations. “There are other factors driving omni-channel fulfillment centers, such as the lower costs from being able to use a common pool of labor, but it’s the inventory factor that’s truly driving this trend,” says Hobkirk’ (Michel, 2016).

Since product usually comes from a single pool of inventory for all of the different channels, the product is just picked at a different time for each channel from that one pool of inventory. For example, retail would be picked in a morning time slot, wholesale after, and e-commerce in designated afternoon hours to make two-day shipping times. Prioritizing is still allowed through omni-channel, so Company X could still prioritize retail product first, but having one inventory pool is most typical in omni-channel.

Company X can still use the carousel and bin system, but product should not be based on a reserved inventory system like they are currently utilizing. However, according to “Key Distribution Strategies of Top Omni-Channel Retailers” in *Logistics Management*, some companies operating omni-channel Distribution Centers find a way to make their segregated inventory pools work. Of a group of eleven omni-channel companies analyzed, only five are able to operate with one pool of inventory. The other six businesses which do not use one pool, however, have developed rules that permit channels to pick from the other channels’ reserved inventory. An example of picking from another channel’s reserved inventory could be if a stock-out of product occurs. “This “intelligent sharing” model ensures that there is sufficient inventory to support planned e-commerce promotions, while still enabling availability for retail and wholesale orders if stock levels run low” (Hobkirk, 2016).

Whether Company X adopts a one pool inventory method or keeps their segregated inventory method but with added “intelligent sharing,” they still need to pick product based off the right characteristics. Company X uses the carousel for mostly core product because it is high velocity. Picking is determined on velocity of product, order size, and physical attributes. The velocity of the product would be dictated by the channel, the order size can differ for each channel, but the physical attributes for the jewelry pieces are very similar. The carousel with pick

to light would work best for orders with eaches, which are single units of product, or small order sizes like with e-commerce where a customer may order just one or two pieces of jewelry.

Overall, in order to be truly omni-channel Company X should alter its current inventory system to one pool of inventory without any reserved inventories for channels. However, since it is a challenge and a significant adjustment for many companies to change from the traditional practice of separated channels of inventory to one pool of inventory, Company X can pick product from the carousel and finished goods vault bin system if it alters its reservation system. It should allow for intelligent sharing and use the picking method based off the aforementioned set of characteristics. Its current reservation system and picking method is inefficient and contrary to omni-channel practices.

Delivery

For delivery, e-commerce customers get free two day shipping if it is ordered before 3 p.m. The other channels, like retail, order based on the time they want the product, unless it still needs to be produced. For example, core can be delivered in two days since it is a forecasted product, unless that channel asks for a later date. When it is a product that needs to be produced, such as new or foundation, it takes ten weeks to manufacture but if a customer wants it at a later date then they can request that. E-commerce and retail use a Company X preferred carrier, while wholesale allows the customer to use whichever carrier they choose since they pay for their own freight. Upon arrival, a signature is required from the customer to ensure product was not damaged or stolen. Since the products are high value items, Company X necessitates this for insurance purposes. Company X giving channels the option to choose the date they want their shipments demonstrates versatility, which is also a best practice demonstrated by Sears and a positive aspect of omni-channel they provide.

Capturing Online Orders

As previously mentioned in the inventory planning section, online orders are captured by isolating a particular quantity that Company X forecasted and reserving it in e-commerce inventory. If sales overestimates what was planned for in the reserved site, then they get can more inventory from the general inventory or vault. The distribution center can also work with stores to see if they have the product needed. Information of what was pulled from the store is captured, but what was pulled from the general inventory is not. The issue with pulling product from stores for online sales is that the stores are not credited with the sale in any way. Stores can give a percentage of the profit to the store as an incentive, which is a creative way to encourage flexibility within the company and achieve progress towards omni-channel presence. However, whether or not that product is available in a nearby store is not guaranteed. Since Company X currently does not reward the stores, there is no incentive for stores to do this and the sale and customer is more likely to be lost. A feature that Company X does have, however, is a button online that says “Find in Store” so that the customer is also able to easily find the product in a store nearby if it is not available online at that time.

While that option to “Find in Store” is beneficial to the consumer, a lesson from Sears could be applied a little differently for a better omni-channel. Company X allows the customer to find the product in a store with that button if that product is out of stock at the distribution center, but the online systems should instead always be checking for the closest fulfillment location. According to “Retail and E-Commerce Operations Chase Accuracy and Flexibility” in *Modern Materials Handling*, “...companies are using store-based inventory to fill e-commerce orders (particularly when it comes to quickly making up for wrong or late orders)” (McCrea, 2016). This practice means that store inventory should be utilized more than just when a product is out

of stock online and a customer is forced to check the availability elsewhere. Sears' omni-channel fulfillment has online orders search for the product at the nearest location since its technology can view inventory levels at every level. While the product might be available at the distribution center, it might be optimal if that same piece of jewelry were at a store just a few miles away from the customer's house. This way, he or she could go and pick it up so Company X saves on last mile cost, or have the store ship out that item to the customer's house if that is the option the customer chooses. This practice directly relates to Sears' "COOL" strategy, where the goal is to fulfill product with the fastest speed or the lowest cost, at whichever location is optimal.

Company X could also learn from Sears' "roadrunner" program, which makes distribution centers store-facing, by allowing customers to pick up a product at a distribution center themselves. If the distribution center is the closest location to them with a SKU in stock, he or she should be able to go to the distribution center. While this Sears best practice with store-facing distribution centers is especially relevant to online orders, it should operate the same for every channel. If a retailer or wholesaler's product was out of stock, those channels should be able to direct a customer to the distribution center if that is most convenient for the customer.

In addition, Company X also provides customers the ability to request that their shipments be delayed if need be, like Sears, as stated in the delivery section in regard to the retail and wholesale channels. If a customer were away on vacation, for example, they can call Company X and asked for the shipment to arrive at a later date than the normal two-day shipping. It also makes sense if the customer can choose the date since the customer must be present upon delivery for a signature. While this practice seems minor, it is this type of convenience for the customer that increases customer satisfaction.

The Sears best practices are especially relevant to how Company X could modify the way they capture and fulfill online orders. Working with stores to help fulfill online sales through profit sharing, having e-commerce be fulfilled through whichever channel that has the product in stock is closest to the consumer, store-facing distribution centers like the “roadrunner” program, and allowing the customer to have more delivery options are all features of an omni-channel practice. Company X already gives the customers useful options when ordering, like with the “Find in Store” button and delaying online orders, but some modifications to their supply chain modeled after Sears could substantially improve their omni-channel operations.

Technology

Company X currently has a fragmented inventory system that does not look at inventory as a whole. They will be implementing a new Oracle system to go live in a few months, with an emphasis on data conversion and end user training prior to its enactment. Not all of the specifics have been determined, but this part of the framework will describe what the technology to support omni-channel should look like when Company X implements the system.

According to *Logistics Management*, “One of the most critical requirements for an omni-channel retailer’s success lays in the planning and executing capabilities of its WMS and other information management systems” (Napolitano, 2013). WMS stands for warehouse management system, which is just one of many software components to an omni-channel capable technology system. An important goal of the technology a firm uses is for its inventory management system to be able to view the entire supply chain with real visibility into current inventory. If a customer enters a store hoping to buy a product that is not in that particular store, a manager should be able to check inventory at the distribution center or at nearby stores and either allow the customer to pick it up somewhere nearby or get it shipped to their house.

“Key Distribution Strategies of Top Omni-Channel Retailers” provides more comprehensive insight on the different software strategies necessary in an omni-channel setting. An enterprise resource planning (ERP), a warehouse management system (WMS), a warehouse control system (WCS), and distributed order management (DOM) have crucial technological roles. The ERP carries out things such as purchase order and sales order management, manage a master inventory, ship confirmations, and channel goods segregation. The WMS manages cycle counting, bin-level inventory tracking, put-away, receiving, the organization of order fulfillment, and picking process. The WCS orchestrates the actions within a distribution center and differs from the WMS because it relates more to “materials handling equipment, workflow visibility, and dynamic insertion of high-priority orders into the workflow.” DOM software serves more high-level functions, such as optimizing locations for shipments and how to fulfill e-commerce orders for consumers (Hobkirk, 2016). Still another important piece of technology that is crucial is a transportation management system (TMS), according to “5 Ways a TMS Supports Omni-Channel Commerce.” Having an e-commerce channel and a goal of an omni-channel necessitates the need for a TMS to make the best shipping decisions concerning cost and service. TMS provides companies with important data and metrics, and real-time visibility into operations which is especially important for omni-channel in order to satisfy customers (*PSL Logistics*, 2015).

Sears’ technology is an excellent example of what the right technology can do. It enables them to search each store’s inventory levels for a product and optimize shipment locations. Their technology helps support their company into making the best, most cost effective decisions and also helps them operate flexibly overall to meet the customers’ needs in any way possible. These different types of software are all vital aspects of the technology needed to support an omni-

channel presence, so the Oracle system Company X uses should function similarly with these types of capabilities.

CONCLUSION

The emergence of e-commerce and Amazon's influence on customer expectations has driven many companies, like Company X, to pursue an omni-channel supply chain. While conceptually simple, operating multiple channels as if they are a single channel is a challenge for companies that are used to traditional, segregated channels methods. Due to a lack of extensive and comprehensive literature on the supply chain changes necessary for an omni-channel presence, this thesis' framework will guide Company X towards its omni-channel development by analyzing what practices they do well and which they should change.

Using Sears as a paradigm for omni-channel, many of their practices directly apply to Company X. Although the changes were discussed in depth in the analysis portion of this thesis, these recommendations are best implemented in a specific order. Changing the inventory planning process is an important first step, since planning for inventory is one of the beginning steps of a supply chain as far as omni-channel presence is concerned. Company X's inventory plan is separate for each channel, but must have a final Sales & Operations Plan so that no channel is planned in a silo. Each channel's inventory plan must be known and visible across departments. A second important recommendation is changing Company X's picking process. The picking process with reserved inventory is not in line with omni-channel practices, so the company should have only one pool of inventory for all channels and do away with a reservation process. Instead, it should prioritize product according to the inventory plan, but allow for sharing across channels when necessary. In addition, although Company X has already chosen technology to implement, the technology must support a transparent view of inventory across the channels. This technological ability was best described in the analysis section of how online

orders are captured. If a customer's desired piece of jewelry is not available online, they are to find it at a nearby store or at the distribution center. However, when a customer orders online the systems should always be checking where the nearest location of that item is, not just at the distribution center. The final recommendation is making the distribution center store-facing, like Sears' roadrunner program, so the customer has the option to pick up a product at the distribution center if they choose. This flexibility provides the customer with options to find more ways to meet their needs.

Within the analysis, other small recommendations were made but these four were the most important and are best implemented in this order. These recommendations will help develop Company X's omni-channel presence and better their position in the high-end jewelry industry.

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ACADEMIC VITA

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The Pennsylvania State University

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Smeal College of Business; Bachelor of Science in Supply Chain
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Work Experience:

Dell, Inc. Undergraduate Senior Analyst

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- Created a governance process for complex orders to reduce overdues and improve customer experience *May 2015-August 2015*
- Built a database in MS Access and created an automated daily report detailing health tolerances
- Saved approximately 500 shared man hours per year to be reallocated and saved \$100,000

Johnson & Johnson Commercial & Business Services Procurement Co-op

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- Negotiated approximately \$800,000 in savings for HVAC units in Capital Construction Facility Services *June 2014-Present*
- Maintained and enhanced 'Shaping the Supply Base' initiative to reduce the supplier base by 20%
- Delivered ad hoc spend analyses to evaluate cost and identify savings and leveraging opportunities
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Nudy's Café Server

Wayne, PA

- Honed interpersonal skills as a server to provide customers with an efficient and enjoyable experience *May 2013-August 2013*
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Leadership:

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- Identified value added activities for members to increase long term student engagement *Spring 2015-Fall 2015*
- Managed Premium membership base through sourcing of merchandise and organizing membership benefits

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- Documented and announced all activity events through organization's email and list serv *Spring 2014*
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- Participate in professional development workshops *Summer 2012-Present*
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