

Strategic Distribution at Company X

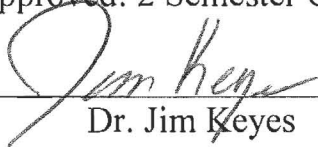
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Abstract

Customer satisfaction and an organization's ability to stay competitive are contingent on implementing and improving existing logistical strategies. Therefore, warehousing has become a crucial part of a successful organization. Businesses must continuously streamline the movement of material to assist in reduction of customer lead times, while delicately balancing inventory storage requirements. Enterprise Resource Planning and Warehouse Management Systems continues to assist businesses in accomplishing these streamlining efforts. Businesses must have facilities that are able to absorb the needs of their continuous growth.

The following study will analyze the current logistical strategies of a company that had in the past primarily sold shoes and apparel, and is now expanding their product lines to include a wide variety of products from, MP3 players and video game consoles to flat screen televisions and bedding. The origins of logistics and warehousing will be examined, as well as the impact of a newly automated system in warehousing with options for expansion. The research

methodology and results will be revealed as well as a discussion and recommendations based on the findings.

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Chapter I: Introduction

Company X was founded in Chippewa Falls, Wisconsin in 1904. August and his son Bert established the business originally, and today fifth generation family member descendants are directly involved in the daily operations of the business. The company started by manufacturing boots for the lumberjacks in the area. The company's first catalog was printed in 1906. In 1922, the company sold shoes door-to-door. In 1969, Company X installed a computer to track sales and the sales people. They were considered one of the pioneers in name and list processing on computers in the early 1970's. In 1997, the salesperson program was discontinued, and business turned solely on direct mailings.

The Internet has played a more recent role in the company's growth. There are approximately 300 name brands and 10,000 styles sold through its newest website alone. The company also expanded into apparel and accessories with the launch of a new website in February 2007. In 2007, Company X was recognized in the *Internet Retailer Magazine* as one of the top 500 Web Retailers in the world. Company X ranked 153rd.

The existing Receiving and Distribution Center has 250,000 square feet of available space, and can hold 1.3 million units. There are 66,000 bin locations in the Receiving and Distribution Center. The Returns Center which is strictly used to process returned merchandise, currently has 30,000 square feet of available space. This facility can hold 250 pallets with 75 items in each, of shoes or apparel.

Company X was considering expanding their product line and installment credit business to compete with their largest online competitors like Zappos.com and Fingerhut.com. Zappos offers more than just shoes and apparel. Due to the wide product offering, they are gaining market shares at an increasingly rapid rate. Fingerhut was founded in 1948, selling automobile seat covers. In 1952, the business repositioned itself to a mail order catalog and diversified the

goods being sold to include everything from the original automobile seat covers to dishes and tools. The Fingerhut Company first went public in 1969.

Installment credit has become a vital part of Company X's business, since footwear and apparel are available to customers at low monthly payments. This facet of the business became increasingly popular during difficult economic times of 2009 and 2010. A credit expansion at Company X would require many changes in the business, significantly affecting the shipping and receiving facilities. The company was considering expanding product lines to electronics, home furnishings, health and fitness, as well as other options. This new product expansion would require significant logistical planning and warehouse reconfiguration.

The challenge for Company X was to determine if it would be more feasible, both economically and practically, to house all facets of the business under one roof or to update existing warehousing facilities. The company needed to make accommodations for the new product expansion while meeting the goals of the overall strategic plan.

Statement of the Problem

Current Company X warehouse facilities is not capable of receiving, storing, or shipping many products desired for future product expansion. This study will develop a plan of how to best address the next three years of the business.

Purpose of the Study

This study will examine the options of remodeling current facilities, renting existing warehouse space, or building a new facility that will also house all company operations in one facility.

Assumptions of the Study

Company X needs to expand facilities to warehouse, receive, and ship product for both the growth of the product line as well as the new credit expansion.

Methodology

Through both cost analysis and constraint analysis, this paper will layout the options for Company X in regard to the necessary increased space required by the new product expansion.

With each season, it is estimated that the number of units will continue to increase. Company X runs the risk of not having the ability to warehouse the amount of product demanded by the customer. This would force Company X to find alternative warehousing space that may not be consistent financially or logistically with the current business practices.

Chapter II: Literature Review

Warehousing

Dr. Tompkins and Jerry D. Smith in *The Warehouse Management Handbook* describe how the history of warehousing can be traced back to the origins of humanity. Humans stored food and merchandise for their commercial gains throughout the development of civilization. Advances in transportation created the need for warehousing as trade points and were established during the Middle Ages (1998, p. 3). These needs continue today.

The major reasons for the creation of commercial warehousing in the Middle Ages has driven the advancement of today's warehousing in the United States as well as around the globe. Warehousing became a necessity during the late 1800s, and continued into the Industrial Revolution. Mass manufacturing facilities and production required storage of both raw and finished goods in warehouses. The continued growth of consumer sales throughout the country created a strong need for distribution warehouses which were located closer to target markets. Warehouses were an important service, moving goods to customers as fast as possible (Tompkins & Smith, 1998, p. 3-4).

Warehousing and material handling remain very important areas of the supply chain. Organizations are focusing on their logistics strategy and current supply chains in order to reduce costs and ultimately better serve their customers. Organizations have focused resources to help minimize warehousing costs which constitute between two and five percent of the cost of sales (Frazelle, 2002b, p. 3).

There are many functions performed within a warehouse that play a critical role in the supply chain. Traditional functions are broken into inbound receipt, storage, pick, and outbound shipment of goods (Tompkins & Smith, 1998, p.2). Prepackaging, pricing, and sortation of batch picking have also become common warehouse activities required by organizations (Frazelle,

2002b, p. 9-11). In a warehouse, the goods being shipped may be raw materials, works-in-process, or finished goods. The handling of the goods within a warehouse is dependent upon the role that the particular warehouse is playing in the supply chain.

Distribution warehouses and distribution centers are used to “accumulate and consolidate products from various points of manufacture within a single firm, or from several firms, for combined shipment to common customers” (Frazelle, 2002b, p. 3). Fulfillment warehouses and fulfillment centers like Company X are primarily designed for the outbound and inbound shipments of small individual customer orders. Companies use local warehouses to facilitate quick response to customer orders, allowing single and small multi-unit items to be picked and shipped to customers every day. Finally, the value-added warehouses are designed to perform activities that were traditionally part of manufacturing. Some of these activities include packaging, labeling, marking, pricing, and returns processing. Many warehouses end up spanning the possible functions based on the requirements of an organization.

Warehouse Management Systems

Warehouse Management Systems (WMS) have become an integral part of the warehousing and Enterprise Resource Planning (ERP) solutions. A computerized Warehouse Management System provides a tool to facilitate the automation and optimization of the material handling process. Warehouse Management Systems can improve inventory accuracy and facility usage, reduce labor costs, and enhance order picking accuracy (Tompkins & Smith, 1998, p. 684). Customers can specify accommodations with most Warehouse Management Systems. These key factors have driven the importance of the Warehouse Management System industry in relation to world-class warehousing. Set up of the software and business processes can be a struggle that can block the great promise associated with a Warehouse Management System.

Kiva Systems is one of the newest leading solutions for e-commerce fulfillment. Kiva is a different kind of material handling process and a different kind of material handling company that entered the scene in 2003. Kiva applies the concepts of distributed intelligence to order fulfillment using unique material handling equipment and order fulfillment software. In 2009, Kiva Systems was named the sixth fastest growing company in the U.S. by Inc.500, and Gartner “Cool Vendor in Supply Chain Management.” Kiva warehouse automation systems are often compared to automated storage and retrieval systems (AS/RS), carousels, conveyor and other traditional automation approaches. Kiva is truly an integrated inventory storage, quality control and order fulfillment system. It is flexible, quick to implement, and easy to use. It can handle products of all shapes, and the products automatically move to the operators when they are needed.

Businesses are feeling pressured to change their processes due to increased global competition as well as the continuing growth of e-commerce, which in the 21st century is seeing an annual growth rate of 12-14 percent. E-Commerce will impact warehouse operations and also the logistics that move goods into and out of warehouses (Shacklett, 2011).

It is estimated, that in the 21st century, warehouses will eliminate the batch and wave operations. In these systems, orders were batched in a picking process to improve labor efficiency. The elimination of the batch and wave processes does two things. It reduces the latency factor that exists when orders need to be aggregated for a batch. Elimination also improves the overall performance of the distribution center since warehousing and distribution are able to acquire a greater ability to make website to doorstep order fulfillment. Robotic pick-pack automation allows the elimination of batch and wave process latency while at the same time reduces the cost of picking the order. Some distribution centers using mobile robotic order fulfillment, experienced a significant time reduction from when a customer places an order to its

arrival at the outbound shipping dock. If an organization can get four times the shipments out the door without having to hire more personnel, labor costs will be down 25 percent (Shacklett, 2011).

Kiva is making mobile robots and moveable shelving units where the shelves come to the workers instead of the workers to the shelves. The inventory identifies itself to the worker, and the worker picks and packs it. The end-to-end process is very ergonomic, safer, and faster. It also reduces the number of times the inventory has to be touched during the pick and pack operations.

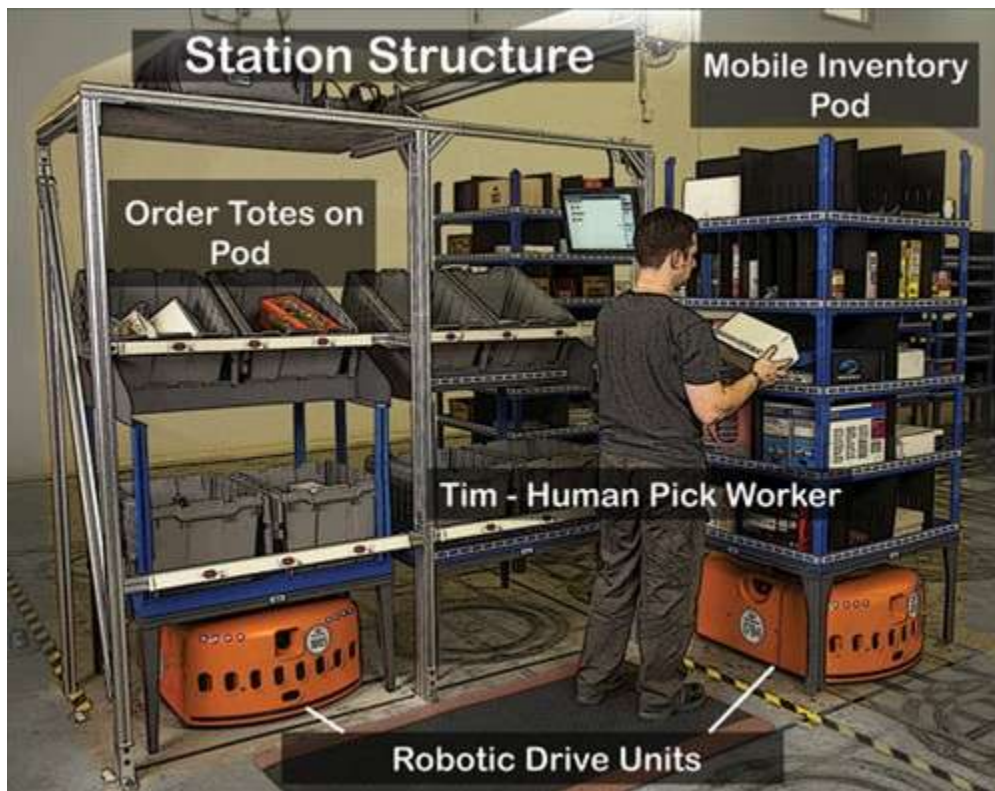


Figure 1 Elements of Kiva System <http://www.kivasystems.com/solutions/system-overview>

One of the challenges that a robotic system like Kiva faces in this 21st century is diverse inventory. Warehouses must deal with the significance of the long tail – the point in the distribution curve for product where there is a very low probability that the item will be ordered – but it does get ordered eventually by some customers, and it must be fulfilled. Kiva's uses the

analogy of Netflix. If you are an avid fan of Czechoslovakian art films, chances are your local theatre isn't going to be showing them, but you can order them through an e-com outlet such as Netflix which has a large catalogue. Today's warehouses must be profitable for long-tail products as well as the very popular products. Customers may even be willing to pay more for unusual merchandise in the long tail. Kiva's unique system adapts to changes in product types, product velocities, order prioritization, and other operational realities. This is not possible with other traditional automated storage and retrieval system equipment. Kiva is based around one simple set of automated storage and retrieval equipment that is mobile, not bolted down.

Lean Principles

Lean manufacturing is interpreted in a variety of ways, but the most common understanding is that it eliminates wasteful steps to reduce the time from a customer's order to the delivery of the final product (Liker & Meier, 2006). The result is a process that delivers high quality products to customers at a low cost, without the need to carry excessive levels of inventory (Womack & Jones, 1996). In order to accomplish this, materials, people, processes, and information must all flow through an operation. Most people do not understand that lean manufacturing is more than just implementing lean tools and practices; it is about embracing a cultural change in the organization (Parks, 2003). For lean manufacturing to succeed, the company and their philosophy must be one that seeks continuous improvement for its people, in addition its process (Bicheno, 2000; Parks, 2003). The goal of lean is to produce exactly what is required, just in time, with zero defects (Liker & Meier, 2006).

Waste Elimination

Customers are only willing to pay for processes that add value to the product, therefore anything that does not directly add value to the product is considered waste (Bicheno, 2000).

Transportation of material or product throughout the factory is considered waste because customers do not want to pay for material to be moved around (Liker, 2004). Unnecessary costs that are incurred by a company are often passed on to the customer. When a company transports materials over long distances this directly affects productivity and quality. It contributes to delays and potential product damage; therefore, it should be reduced as much as possible (Bicheno, 2000). The waste of waiting occurs when operators are idle due to imbalances in the production line, late material deliveries, or machine/operator inefficiencies (Bicheno, 2000). According to John Bicheno (2000), “waiting is the enemy of smooth flow”. Any wasted motion such as bending, reaching, and searching for parts is considered unnecessary and directly affects ergonomics, ultimately impacting quality and productivity (Bicheno, 2000).

Standard Work

Stability must be present before standard work is in place. Standard work is a fundamental lean tool that clearly defines processes step-by-step and is visually displayed to operators while performing job tasks (Liker & Meier, 2006). Standard work is also a tool used by supervisors and managers to track repeatability of tasks and operator adherence. Auditing standard work practices uncovers root problems and ensures that problems are corrected quickly in order for processes to re-stabilize (Liker & Meier, 2006).

Flow

Once wasteful steps in processes are identified and eliminated, flow is enabled (Harris, Harris & Wilson, 2003). Unless a product can flow continuously from start to finish, or demand is perfectly consistent, inventory must be present to supply customers effectively. Reducing variation in transportation times, cycle times, up-time and demand will drive inventory needs down and help create better flow (Harris, et.al, 2003).

Industry Standards

Many businesses struggle with whether to buy a facility or lease. There are pros and cons to both options. Typically when a company is leasing a facility there does not need to be as much upfront cash provided. On the flip, side when a company is seeking to buy a building, there would be a down payment required. There would be fees associated with an appraisal, building inspections, loan fees, and multiple other costs.

When buying a facility, there is a pretty good idea of what the costs will be year after year, especially on a fixed-rate loan. When leasing a facility, a company may be subjected to vagaries of the market when the lease term expires. There are many leases that will have a clause allowing for an annual cost increase tied to changes in the Consumer Price Index or some other measure (Anthony, 2011).

The value of a business may not have much effect on the value of real estate, but owning real estate as a business asset offers some possible positive financial advantages. Financing options are more numerous for real estate than they are for capital assets. Since real estate is viewed as an investment with almost unlimited lifespan, it can be financed with equity, mortgage loans, or sale-leaseback financing (Volk, 2011).

Summary

This chapter reviewed the three components of a warehouse. These components were historical use of a warehouse, the development of a warehouse, and the future usages. Company X is currently primarily designed for outbound and inbound shipments of small individual customer orders. It was imperative to review their Warehouse Management Systems and lean principles.

In reviewing Warehouse Management Systems and lean principles, it was found that the Kiva system is one way in which Company X can help improve the amount of warehouse space

needed. Inventory will be more accurate as product is not touched as often as in the old system. Labor costs can be reduced up to 25 percent since product shipment can be increased up to four times with the reduction of time from order entry to shipping. The end-to-end process is more ergonomically friendly, safer, and faster. The result will be a process that delivers high quality products to customers at a low cost, without the need to carry excessive levels of inventory. This is due to an increased flow of materials, with the same number of people, more efficient processes, and accurate information throughout the operation.

Chapter III: Methodology

Company X is considering expanding their product offering to compete with other online competitors. The company currently offers installment credit to qualified buyers. With the expansion of the product line as well as installment credit to qualified buyers, the company is analyzing and evaluating how it will expand the facility to receive and ship new product. The current warehouse facilities at Company X are nearing capacity at this time, and the facilities are not currently capable of receiving, storing, or shipping many products desired for future expansion. The research methods used to meet the objectives of the study include an examination of the current warehousing facilities, decision criteria, data collection methods, and limitations to this study.

Examination of Current Warehouse Facilities

Currently Company X ships a majority of their footwear and apparel out of the existing receiving and distribution center which has roughly 250,000 square feet of available space. This main distribution center facility can hold approximately 1.3 million units. There are 66,000 bin locations in this receiving and distribution center.

The company's returns center has roughly 30,000 square feet of available space. The returns facility can hold approximately 250 gaylords. This facility is used solely for the purpose of processing returned product.

Company X also has a building on River Street that has not been used for distribution for many years. This River Street building currently stores catalogs prior to shipment. The building is three stories with roughly 40,000 square feet. This building is located downtown and does not have easily accessible dock doors, provide adequate parking for staff, and would need major renovations to facilitate Company X's storage needs.

Lastly, Company X has recently obtained additional rented warehouse space at the Warehouse of Wisconsin (WOW) building located within a three mile radius of the current facilities. The Warehouse of Wisconsin facility is used to store accessory items such as handbags, backpacks, coats, hats, and gloves, along with some of the new credit expansion product. This new product ranges from kitchen clocks, exercise equipment, comforters, MP3 players, and big screen televisions. Company X currently rents 37,000 square feet of available space from WOW, and this facility can hold approximately 142,000 units.

Decision Criteria

The operations managers worked closely with the distribution manager, and decided that the most important criteria for the expansion was the square footage. If it was decided to continue to rent space, the new facility would require a minimum of 100,000 square feet due to a required short-term lease. It was decided that a newly built future facility would require 600,000 square feet in order to accommodate current product as well as room for future expansion.

Once the square footage was decided on, the operations team determined that the cost per square footage would be a driving force in the three decisions.

The second weighted criteria was the ability for growth and expansion. The operations team deemed it necessary to have the ability for future expansion at the designated location, or it would not be worth the initial investment. The company did not want to be in the same situation in future years if the new credit expansion took off.

A third criterion the company looked at was sustainability in the sense of the ability to go green for heating and cooling the facility. The company looked at the locations that were being considered and at the functionality of options like solar panels on the buildings, sky lights, geothermal heating and cooling, and motion sensor lighting.

A fourth criterion the company looked at was the ability to increase automation levels. The company had investigated the Kiva fully automated system during earlier expansion talks, and had deemed that as an investment that would be beneficial in a new facility. If the Kiva system was not able to be utilized, the facility would need to accommodate conveyor systems.

Data Collection Methods

The operations team and distribution manager ran current inventory numbers by department. They compared the current value and product mix against future forecasted volumes with same product mixes for the next three years to obtain an estimated volume.

Next the operations team and distribution manager considered the cost of conventional racking, order selectors, and conveyance systems versus the Kiva system, program costs, and infrastructure costs. Table 1 illustrates the comparison points that the operations team deemed necessary to investigate the three options.

Comparisons Points	Warehouse of Wisconsin	Expansion of New Facility	Building New Campus
Maximum Square Footage			
Clear Ceiling Height			
Kiva Capable			
Cost Per Square Foot			
Infrastructure (conveyance, RF network, racking, etc.)			
Efficiency of Building (heating, cooling, lighting)			

Table 1. Warehouse Comparison Points

For future rental of new Warehouse of Wisconsin space, it was decided to obtain the average warehouse rental cost per square foot in the local area to negotiate.

The operations team decided to obtain quotes from two major engineering firms A-C/a and SEH for the outside of the new or expanded facility. Company X got quotes from three major contractors to perform the conveyance and interior facilities.

Company X worked with the two engineering firms to set up a list of criteria that they felt were important to consider with either building an addition to the existing distribution center or building a new facility. The owners of Company X would examine the cost of each option, and decide if either option was feasible at that time. Table 2 illustrates what information was obtained for the quotes from the local engineering firms for all three options of Company X.

	Expansion of New Facility	Building New Campus	Adequate Time To Prepare
Site Work			
Demolition			
Concrete			
Pre-Cast			
Steel Superstructure/Misc. Metals & Erect			
EPDM Roof			
Smoke Vents/Curtains			
Offices/Rest Rooms/Break Rooms			
Windows/Entrances & Exterior Doors			
Overhead Doors/Dock Equipment			
Elevator			

Table 2. Quotation Criteria for Expansion

Limitations

Limitations included availability to rent required space from current Warehouse of Wisconsin facilities. The second limitation was a need to meet with city officials to determine the level of support for Tax Increment Financing (TIF) assistance. A third limitation was meeting with city officials to determine level of support to abandon Williams Street. Another limitation was meeting with utility companies to determine feasibility in rerouting utilities on Williams Street. A final limitation was meeting with city officials to address any zoning or approval issues.

Summary

The current warehouse options for Company X were examined. The operations team set decision criteria. Once the decision criteria had been established, it was decided to obtain quotes from local warehouse rentals using per square foot figures to negotiate with Warehouse of Wisconsin. There were also discussions about current and future rental availability with Warehouse of Wisconsin. It was also agreed that Company X would obtain quotes from two major engineering firms for an expanded facility or new structure all together.

All options have both positives and negatives. Warehouse of Wisconsin has a much lower initial cost, but then the company is capped at a maximum of 150,000 square feet for this facility. Setup costs are the lowest of all options but if the company grows faster than expected, Company X will be in the same dilemma that they currently are.

Expansion of the current facility would require substantial capital for Company X. The build cycle for this project is one to two years. The build cycle includes planning, obtaining required permits, and fitting the facility.

Lastly, building a new facility would allow Company X to have adequate storage space for current needs, as well as future increased volume. This building would accommodate growth and increase efficiencies by bringing all facets of the company under one roof. By building a new facility, there would be roughly 350,000 square feet that the company would need to utilize. Company X would need to either lease the current buildings or sell them. The clear height is quite low and could cause marketability to be limited.

Chapter IV: Results

Company X is looking to expand their receiving and distribution facilities due to current product growth as well as product expansion. The current facilities are not adequate to receive, warehouse, and ship all product categories with the new expansion. Company X specifically seeks to have a facility that allows for immediate expansion as well as continued growth, while minimizing costs.

Examination of Warehouse Options

Company X is currently looking at leasing a larger space from Warehouse of Wisconsin, but located in the same area as the current facility. The newly rented facility would be located near a main highway, and easily accessible. The space would allow Company X to obtain up to 150,000 square feet, which would be an increase of over 100,000 square feet from their current location. The average yearly cost of leasing space similar to this in the area is \$5.80 per square foot (LoopNet, 2011).

Company X currently leases 37,000 square feet from Warehouse of Wisconsin, and the additional leased space would allow a maximum of 150,000 square feet.

Expansion at the Warehouse of Wisconsin will allow for implantation of the Kiva System. The Warehouse of Wisconsin facility has 30 foot ceilings, and Kiva racking stands eight feet high. Due to the height of Kiva racking, there would be potentially a large amount of wasted space. One option to maximize the buildings volume would be to install a mezzanine system, which would require elevators to move the pods from level to level. There would be extra dollars required for the mezzanine system. This system could cause bottlenecking issues with the elevators moving the pods from one level to the other. Figure 2 displays a mezzanine system that could maximize the volume usage of a building. Figure 3 illustrates an elevator system which would be used to transport Kiva pods from one level to another



Figure 2. Mezzanine System from <http://www.globalspec.com/reference/233023/run-a-greener-business-with-custom-built-mezzanines>



Figure 3. Elevator for Mezzanine System from http://www.alphamaterialhandling.com/mezz_lifts.html

The cost per square foot of the newly leased space at Warehouse of Wisconsin would be approximately .30 cents per square foot per month inclusive of taxes, all utilities, maintenance, snow removal, and lawn care.

With the newly leased space at Warehouse of Wisconsin, Company X would need to install racking, wire the building for RF network, conveyance, automatic tapers, and all pack

stations including PC's and printers. The cost of this new infrastructure would be approximately \$600,000.

Warehouse of Wisconsin is a ten-year-old building. Because of the age of the building, it would not be as energy efficient to operate for as lighting, heating, and cooling as a new facility. Insulation technologies have changed, affecting the heating and cooling. New facilities also offer motion lighting to help maximize utility costs.

The second option for Company X is to expand its current distribution facility. This option would provide the least amount of added space for expansion, and would require rerouting an existing city street along with the utilities. There might also be zoning approval issues for this expansion. The cost for this expansion is roughly \$50.00 per square foot.

The current facility of 250,000 square feet has only 12 feet clear height. Sprinkler systems for the facility only allow racking of eight feet in height. The new addition would allow a maximum building footprint of 200,000 square feet and the maximum vertical height would be three levels.

The addition to the current distribution center will allow for installation and implementation of the Kiva System. This system would work well in the old building due to the low ceiling heights. In the expansion with the 40 foot clear height, the company again might need to build a mezzanine and install elevators to accommodate pods transferring from floors. This again is an added expense, and may have bottlenecking issues due to the elevators moving the pods from one level to the other.

The cost of the addition to the current distribution center would be \$50.00 per square foot.

With the addition, Company X will need to install racking, conveyance, pack stations which include PC's and printers, along with wiring the building for RF network. Conveyance systems would also need to be rearranged in order for the two buildings to be tied together.

The existing distribution center is 40-years-old and has only had general maintenance since it was built. There have not been any upgrades in efficiencies to date. The new addition would allow Company X to install state of the art green technologies. Some of these technologies would include motion sensor lighting, solar power, thermal heating, high efficiency and insulation.

A final option would be to build a new facility that would potentially house all departments under one roof. This facility would be a minimum of 600,000 square feet and after obtaining quotes would roughly cost \$50.00 per square foot to build the shell.

Like the other two options, the new facility would allow for installation and implantation of the Kiva System. This new facility would have the same constraints as the other two facilities. Again there would need to be a mezzanine installed as well as elevators to accommodate pods transferring from floors. This again is an added expense, and may involve bottlenecking issues due to the elevators moving the pods from one level to the other.

It was decided that at this time Company X would not entertain the idea of updating the abandoned River Street building due to the limitation of available space, not meeting current needs. There is not sufficient parking at this facility for employees. There is not ample space for carriers to turn around at this location to access the dock doors because of the proximity to other buildings and businesses. There are only two existing dock doors at this facility which would not allow for inbound and outbound shipments. This building has 40,000 square feet split between four floors. The elevator that is currently available is in need of repair in order to utilize

the multiple floors. Table 3 illustrates a summary of the three current building options and comparison points that Company X examined.

Comparisons Points	Warehouse of Wisconsin	Expansion of New Facility	Building New Campus
Maximum Square Footage	150,000 square feet	200,000 square feet	600,000
Clear Ceiling Height	40 feet	30 feet	30 feet
Kiva Capable	Yes	Yes	Yes
Cost Per Square Foot	.30 cents per square foot per monthly lease	\$50.00 per square foot	\$50.00 per square foot
Infrastructure (conveyance, RF network, racking, etc.)	\$600,000	\$5 million	\$5 million
Efficiency of Building (heating, cooling, lighting)	10-year-technology	New portion State of the Art (250,000 square feet would be at 40-year-old technology)	Green State of the Art

Table 3. Results of Warehouse Comparison Points.

Summary

Company X decided that at this time it would not entertain the option of updating the River Street building. The amount of space that would be available was split between multiple floors, had an old elevator in need of repair, and only ten foot ceiling heights. There is also not adequate space for employee parking and carrier delivery and pickup.

With the Warehouse of Wisconsin option, the building is ten-years-old and therefore would not be as energy efficient as a new facility. This facility does allow for the Kiva system to be implemented, but there would be a tremendous amount of unused vertical space unless a

mezzanine system would be erected. A traditional racking and conveyance system would be the best option in this building to optimize the cube space. This would be the least costly option.

Expansion of the Williams Street Building would allow more square footage than the Warehouse of Wisconsin option, however the existing portion of this building is 40-years-old. Once again this portion of the building would not be as energy efficient as a new facility. This expansion option would allow for 30-foot clear ceiling height in the new 250,000 square foot expansion. Again the Kiva system would be able to be implemented in both the old and the new portions of the building. However, the new portion of the building would require a mezzanine system with elevators to fully utilize all vertical space.

Finally, the option of a new facility would be the most costly, and would require the most planning. Company X would be able to take advantage of implementing TIF money, City incentives, and green technologies when building this facility. This would allow the company to build in such a way that it could expand as the company continued to grow. If the company chose to build a new facility, it would take several years. In the interim, space would be required to house the inventories needed for the sales forecasted.

Chapter V: Discussion

As stated earlier, Company X is expanding the existing product line as well as adding a new credit expansion product line for customers. The existing facilities will not hold the inventory for current expanded product lines, let alone the new credit product line. The company was forced to entertain options for new or expanded warehousing facilities. After researching options it was decided that the company only has two realistic options at this time.

The first option is to rent additional space for a short-term period to allow expansion of current product, while also receiving and processing new product. Rent on average for warehouse space in the local area is \$5.80 per square foot per year. This option is appealing as it is unknown how the new credit venture will grow in product category or volume.

The second option is to build a new 600,000 square foot facility in a nearby industrial area which would cost roughly \$50.00 per square foot for the shell.

Limitations

If the company does nothing, they run the risk of the business growing too rapidly and not having the room to expand. There could be loss of sales and the company might be forced to find alternate storage without adequate requirements. The company might not have the same negotiation strategies that it would otherwise have if it had more time to look at multiple facilities in depth.

If the company leases a facility for a short-term lease of no more than three years, they still run the risk of the business growing too fast and running out of room once again before the lease expires.

If the company builds a new facility, they run the risk of having a building that is not fully utilized and more capital will be tied up.

Results and recommendations of this study are limited to this business case of February 2010 to March 2011. This study only applies to Company X at the times listed and at this location. Company X's current business plan is to continue to grow the new credit venture as well as expand current product selection. Current forecasted volumes for fall 2011 have increased two to three times the original forecasts. Company X must have exceeded capacity in the month of December, to handle the Christmas Holiday volume.

Conclusions

Due to rapid sales growth in both the existing product sales and the new credit venture, Company X needed to find space quickly. The option of negotiating a short term, three year lease, with Warehouse of Wisconsin for a larger facility would help minimize shipping and receiving issues that were rapidly increasing. It is recommended that with the current economy still in question, with new credit expansion rapidly growing, and the option to lease a larger facility from Warehouse of Wisconsin immediately, Company X consider this alternative at this time.

Company X would be able to utilize current racking and conventional conveyance systems in the expanded warehouse space. Company X could use this three year lease to continue to evaluate Warehouse Management Systems such as Kiva. Three years allows for evaluation of future business practices and space needs. If more space is needed within three years, Company X would have the ability to either negotiate with Warehouse of Wisconsin to possibly build a new facility to lease, or invest in building a new facility themselves in the industrial park with TIF, government grants, and city incentives.

Recommendations

With the rapid rate of growth that Company X has seen in the recent product expansion, a new credit venture, and an uncertain economy, it is recommended that the company sign a short term three year lease with Warehouse of Wisconsin in order to take advantage of the increased 150,000 square footage. The Warehouse of Wisconsin facility would allow Company X to utilize current racking and conventional conveyance systems, to cut down on the added expense of purchasing new systems. Utilizing the existing racking and conveyance would also allow Company X to further investigate more up-to-date technologically advanced systems for future facilities.

Future Considerations

First, Company X should work with real estate developers to stay on top of any future plans for large facilities that would accommodate the warehousing needs of Company X.

Secondly, Company X should work with local economic development centers to continue to be informed of developing tax incentives or related incentives in the local communities.

Finally, Company X should look at the option of moving distribution to a third party company. Company X would handle all the sales and marketing, but use the third party company to drop ship product to the customer. That company could manage all distribution aspects and be located near major hubs of all distribution suppliers such as FedEx, UPS, or DHL. In the next five years as technologies change and the business changes, Company X will need to continue to assess the return on investment on any warehousing plans.

Summary

With the expansion of the existing product line as well as adding a new credit venture, Company X's growth plans will require additional space to house needed inventories. Future projections of sales will require space for all aspects of the distribution center. With increased inventories there will be needs for increased pack stations, receiving stations, racking, forklifts, order selectors, and other material handling equipment.

After only one sales season of the new credit venture, the uncertainty of the present economy, and a very conservative operations team, it is extremely difficult to choose between options. Continued evaluation of sales plans, space, and distribution practices are required. The option that is settled on must be flexible enough to support variations in sales up or down. Until Company X better understands the full direction of the new business venture, the final option must be fairly fluid.

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