Facilities Planning and Warehousing

1. Since the target market may want items at all hours of the day and night, and at short notice, a satisfactory site will have to be located in an area that is easily accessible and that is near the target market. Since the target market consists primarily of geeks, a warehouse located in Silicon Valley would be ideal. The site will need to allow good traffic flow so that products can be easily delivered to and from the site. The site would also need to be large enough for storage space for the products.

To determine the location of a satisfactory site, we will have to identify where the target market works and lives. The traffic flow to and from the target site is also important. In addition, the cost to rent the warehouse, and the size of the warehouse will need to be taken into consideration.

2. Items that have long delivery times should be kept in stock at the warehouse. Items which can be easily obtained from nearby stores do not need to be kept on stock as they can be purchased and delivered when the order is received. If the store is closed, a bonded agent from MyShopingCart.com would open the store, obtain the needed item, and leave an invoice with customer service. If MyShoppingCart.com does not have an agreement with the store owners to obtain the items from the store to sell to a customer, then it may be necessary to keep the more popular items from the store in stock at the warehouse, especially if these items are not available at other stores, and if there are no substitutes for those items. Information such as which stores have agreements with MyShoppingCart.com, as well as what items stores in the area hold, regardless of whether they have agreements with the business, would be useful in determining what items should be kept in stock.

To further determine what items need to be kept in stock, the business should conduct market research. The target market could be surveyed to determine the demand for various items. From this information, the business can also determine the optimum stocking level of each item. As the business progresses, orders can be analyzed and predictions can be made as to the optimum stocking level of each. Patterns in the orders, such as whether certain products are seasonal, or whether certain customers are more likely than others to order particular products, can be analyzed, and the optimum stocking level determined. The optimum stocking level also depends on the size of the facility as well as which stores have agreements with MyShoppingCart.com to allow agents to obtain items. As the number of stores that have agreements with MyShoppingCart.com increases, the number of items that need to be kept in stock should decrease. The amount of time it takes for the stores to deliver the item to MyShoppingCart.com will also affect which items need to be kept in stock.

3. To determine the warehouse capacity, first consult the leasing contract regarding the weight that is allowed. The leasing contract should specify the limitations on floor-load per square meter. The warehouse size is then determined by the maximum weight and volume of the items to be stored at any single period in time, which is in turn determined by the rate at which the items are depleted, the time to restock, and the type of distribution system.

When determining the size of the facility needed, note that only 70% percent of the floor capacity of the warehouse is actually available for storing items. The remainder is necessary for ventilation, walkways, package handling and other activities. To determine the volume of the facility needed, determine the volume of space that will be physically occupied by the items, then divide this volume by .7. A slightly simpler, though less accurate computation, is to multiply by the amount of volume physically occupied by the items, by 1.3.

The items should not be stacked to higher than 2.5 m; higher stacks increase the chances of the items being damaged, and of items falling. In addition, there should have at least a 1 m clearance between the ceiling and the items. The stacking height should be taken into consideration when determining the floor space of the warehouse.

4. Universal Product Code (UPC) bar codes are made primarily for identifying the product manufacturer as well as the product itself. Since price is not encoded into the bar code, the business can change the prices at will, which will allow the business to adjust prices based on demand and supply. Another benefit of bar codes is that by using the number system character (with first digit 4), the business can design its own code; a downside is that no other store will understand these codes.

Radio Frequency Identification (RFID) tags are bar codes that communicate with a networked system to identify every product purchased. As a product is removed from a contracted store, the RFID tags can communicate with an electronic reader to instantly compute the bill, and the amount deducted from the appropriate account. RFID tags have read and write capabilities. This allows the data on RFID tags to be updated. The data collected allow the business to examine the speed at which products are sold, and which customers buy which products. This also allows the business to compute the optimal stocking level of each item. The downside of RFID tags is that RFID tags are not as commonplace as bar codes are. Most passive RFID tags cost from 7 to 20 cents each, and the cost can be passed on the customer.

2-D bar codes, also known as matrix codes, are capable of storing many times more information than UPC bar codes. Comparatively, a popular 2-D bar code can store over 7,000 digits or 4,000 characters of text, while a 1-D code can store only a maximum of 20 characters. A convenience offered by 2-D scanners is that they can be scanned and interpreted by smartphones.

MyShoppingCart.com will need a lot of information about the items—such as identifying the items upon arrival, identifying where they are stored in the warehouse, and any special procedures for retrieving the item. Items on consignment will require additional information such as the store that left the items for sale. Since 2-D barcodes can store a large amount of information, and, especially, be scanned by smartphones, this technology would be ideal for the business. As agents remove items from the contracted stores, they would scan the items on their smartphones.

5. The 2-D barcodes would be best since they are fairly popular, and, most importantly, can be scanned by smartphones. The 2-D bar codes can store a large amount of information, such as which store left the items on consignment. In addition, the delivery personnel could read the 2-D bar codes with smartphones; they could even use their smartphones to receive real-time driving instructions that consider traffic congestion and road closures during deliveries.

6. Workers should be properly certified to operate any equipment necessary for working at the warehouse, such as forklifts. Workers should also been trained about the hazards of certain chemicals which may be flammable or corrosive. All electrical outlets in the warehouse should have ground fault circuit interrupters (GFCIs). Fall restraints, such as guardrails, should be installed to protect workers from fall hazards Portable fire extinguishers should be made available and workers should be trained in their use.