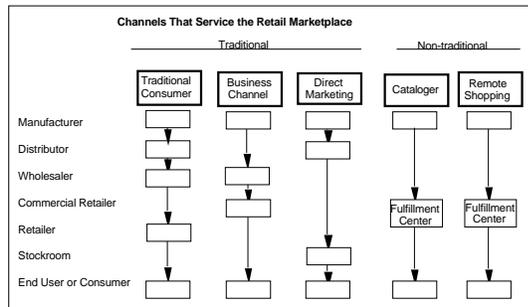


LOGISTICS NEEDS OF NON-TRADITIONAL RETAIL

In non-traditional retailing, functions of warehousing, inventory management, materials handling, and logistics represent the physical link between the non-traditional retailer and the end user or consumer. The effectiveness of these physical functions is one of the major points that distinguish the non-traditional retail channel from the more traditional retail model.

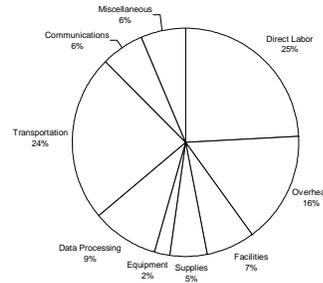


In the development of any channel it is essential that the strategy be rooted in the service expectations of the ultimate consumer. In non-traditional retailing such expectations include the timely receipt of goods at the point of use without encumbering the user with unnecessary delays and/or the need to go to any pre-defined service point or repository of inventories.

Further expectations are that the right product, size, style, and color be always available to the consumer. In addition to the above service expectations, it is assumed that non-traditional retailing will deliver a broader selection with a higher level of service, expanded availability, at an overall lower cost than the traditional retail channel. The absence of such service levels can cause non-traditional retailing to have minimal added value from that of traditional retailing. The delivery of such services is represented by the physical delivery of goods and services to the consumer. Such service is the only physical connection between the non-traditional retailer and the consumer.

The cost of logistics elements in non-traditional retailing varies greatly dependent upon the type of goods being distributed and the target markets being sought. A survey of some 39 catalog fulfillment operations gives a look at the elements of logistics costs.

The make up of the catalog fulfillment operators is typical of the catalog channel although it is still representative of the entire non-traditional retail channel.



Total logistics costs average around 17.2% of total sales dollars. Generally, higher fulfillment costs were associated with a wider array of SKU's or a larger variety in the product mix.

AVERAGE FULFILLMENT COSTS		
Cost Category	Avg. cost as % of sales	Avg. cost per order
Direct Labor	4.2%	\$4.48
Overhead	2.7%	4.80
Facilities	1.2%	1.63
Supplies	0.9%	1.02
Equipment	0.4%	.51
Data Processing	1.6%	2.04
Transportation	4.0%	3.99
Communications	1.1%	1.60
Miscellaneous	1.1%	.82
Total Costs	17.2%	\$20.66

Source: Catalog Age

While the size of the organizations in the survey ranged from \$1 million in annual sales to \$385 million, the general characteristics of catalog operators was constant.

In order to understand each cost element we will examine each function separately, first warehousing and then material handling.

Warehousing/Distribution /Logistics Utilities

Warehousing is defined as the storing of goods and warehouse defined as a place for the receipt and storage of goods. These definitions are misnomers for facilities utilized in non-traditional retailing for the distribution of goods. They are more properly described as logistics utilities in that they provide for not only the receipt and storage of goods, but also for the timely distribution or delivery of goods to consumers on demand.

1. Current Market

Warehousing space runs the gamut from 10,000 to 20,000 sq. ft. up to in excess of 750,000 sq. ft. per facility. Variation of size is more a result of type of business and degree of maturity and sophistication of the operation, than any other specific characteristic. The more mature and developed business tends to be more highly automated and larger in total size. This does not, though, imply that the smaller operations are any less efficient given the numbers of different types of activities that make up non-traditional retail distribution.

Such logistics utilities are made up of receiving operations, storage, and pick pack fulfillment areas, outbound shipping areas, and return goods processing areas. Receiving operations are areas in which inbound receipts are received, checked for accuracy, quantity, and quality inspection. Goods are then transferred to a storage area in the facility where they may be held for long-term storage and/or placed in fulfillment areas for order selection. The fulfillment area is generally comprised of two different sections. One section is for pick pack or individual item picking which would be picked on an order basis and then assembled with other items and packaged for shipment. A second area would be a selection area for full carton, full case, or full pallet quantities to be picked in such quantities for shipment and consolidation with pick pack each-items that were assembled in a separate staging area.

The return goods processing area is an area which receives returns from consumers, stages them until they can be processed, and processes them in order to issue credit, inspect the goods and determine whether they should be returned to stock, and/or disposed of. The return goods function is a major activity in a non-traditional retailing logistics utility operation often handling volumes equal to 30-40% of outbound orders. The final area in such logistics utilities is the shipping area. At this point the individual parcels are assembled, consolidated, and prepared for shipment. Carriers are selected, individual bills of lading, freight bills and shipping manifests are prepared, and shipments dispatched.

2. Proprietary vs. Outsourced

Large non-traditional retailers such as television catalog operations are more likely to run their own logistics utilities, whereas small to mid-sized non-traditional retailers, catalog operators, infomercial and commercial response activities are more inclined to utilize outside fulfillment distribution facility operations. For the sake of definition proprietary or private operations are those operated by a company whose primary business is something other than warehousing and logistics and as such the facility is operated to serve the internal needs of that organization only.

Third party operations are warehouses or other logistics operations operated for the convenience of other businesses or individuals. The principle business of a third party operator is providing warehouse and logistics services to other organizations.

3. Traditional vs. Fulfillment Warehouses

Traditional warehousing is made up of a break-bulk concept where large quantities of goods are transported by lowest cost methods, often rail or water, to a large box configuration storage and re-distribution warehouse in which the quantities are then allocated for shipment, normally in full pallet lots. Thus, the principle activity is the removal of full unit loads or pallets from inbound transportation and the shipping of similar full units or pallets by an outbound transportation mode. The inbound and outbound transportation is generally full truckload or LTL and seldom is small parcel.

Fulfillment warehousing is a very different operation than traditional warehousing. In the fulfillment warehousing activity goods are received in less than full unit or pallet quantities, thus requiring input of labor to off load and receive inventories. These inventories are then further sub-divided and held in stock picking locations in order that individual orders can be picked from stocking locations and assembled into outbound shipments. These outbound shipments typically are less than unit or pallet quantities, often being individual parcels of each-picked items. The picking activity from individual stock keeping locations is labor intense as is the re-packing and order assembly activity. Thus, the fulfillment warehousing process differs from traditional warehousing in that it is more labor intense with higher unit costs and has an increased potential of shipping and picking errors and product damage.

Distribution facilities range in size from 10,000 to 20,000 sq. ft. up to 750,000 sq. ft. with the larger facilities generally being proprietary operations. A typical non-traditional retailer's warehousing /distribution facility is a basic warehouse fulfillment operation with minimal material handling sophistication or automation installed. These facilities generally work on a one to five day order cycle employing from 40 to 600 employees and tend to be located in non-urban areas.

Customer Needs - the customer's expectation for non-traditional warehousing distribution facilities are fast response, high accuracy, damage free shipments. Speed of order fulfillment is expected to be one to two business days. Accuracy and damage free shipments are expected to be 98%+.

Major Operators - dominant operators in non-traditional retail warehousing/distribution facilities are individual non-traditional retailers themselves running proprietary or private warehouse operations. In addition, there are a number of third party operators who specialize in fulfillment.

In addition, there are a number of third party logistics service providers that include fulfillment as a part of a larger outsource logistics offering.

4. Future Trends

There are three major factors at work that are going to have dramatic impact on warehouse distribution facility requirements for non-traditional retailers of the future. These are: increasing customer expectations, increasing outsourcing of warehouse and distribution activities, and utilization of technology which will allow the substitution of information for inventory thus reducing warehouse storage space requirements.

A survey of fulfillment operator's priorities indicated their desires to address the information/inventory - service trade-off.

5. Customer Expectations

A decade ago a customer utilizing non-traditional retailing expected a total order cycle time of 2 weeks to 3 weeks from the time they placed the order until the time they received their goods. With increased service, faster parcel delivery, quicker electronic transmission of orders, and greater competition in the non-traditional retailing category expectations are rapidly changing. Today, expectations are in the range of 2 to 3 working days and will become next day. These increased expectations will have an impact on warehouse and distribution facility operations. Previous standards of 2 to 3 days in-house order cycle times will no longer be acceptable. Likewise order accuracy and condition of goods received expectations will also rise with expectations of 100% accurate, 100% damage free goods received within the time window allotted.

6. Use of Third Parties

The trend of outsourcing assessorial services such as warehousing and distribution facility activities will continue to rise. This increase in outsource logistics functions will be highly accelerated in non-traditional retailing due to the step function costing associated with this type of activity. As operations increase in size and activity and as the number of stock keeping units increase, the need for higher cost information systems, material handling automation, and the basic investment in physical facilities rises. As such, the logic of utilizing outsourced third party professionals to perform such functions increases in its attractiveness. As third party fulfillment operators become more

efficient in the area of addressing non-traditional retailer's needs and as the stability of third party fulfillment providers improves both operationally and financially, more non-traditional retailers will turn to the use of such third parties.

7. Possible Future Changes

The use of increased technology, both in information systems allowing the substitution of information for inventory as well as technology and automation in material handling within the distribution facility, will have a significant impact on the future of this area. The trade off of information for inventory will require smaller storage and warehousing facilities to accommodate a similar or larger amount of total revenue sales. The ability to anticipate demand for merchandise allows for a flow-through of inventory satisfying consumer demand, while lessening the need for storage. The need for flow-through facilities which require a higher concentration of labor activity per square foot of facility encourages the use of more sophisticated material handling systems and processing automation.

Material Handling

Anyone who has ever tried to process broken case orders (pick pack) in a facility designed to handle pallet in/pallet out knows how important effective materials handling systems are and the necessity that they be designed to reflect the type of physical operations to be conducted. Material handling systems are the internal workings within a distribution facility that permit increased productivity, increase the facilities handling capacity and reduce the individual per unit operating cost.

1. Storage and Selection

The base line material handling standard for non-traditional retailing is the facility in which static shelves with sections 3 ft. wide, 18 in. deep, 6 ft. high with 6 shelves per section, are stocked with individual stock keeping units for order selector picking. In this example the stock selectors walk through the aisles, moving to the individual products, pick the required quantity, and carry that quantity back to a picking packing area where the order is assembled for shipment. In this environment there are no conveyors, carts, totes, sortation units, or other automated or mechanized systems in place. This type of operation is commonly found in small fulfillment facilities and less sophisticated third parties doing fulfillment. While it is labor intense it has minimum cost associated with capital investment and start up and it has flexibility to handle a changing product line. It provides minimal restrictions to change in product or processing and is only limited by the number of selectors who can physically be accommodated in the picking aisles. In order to move beyond the base line example, it is necessary to consider the type of goods being handled,

the length of time the product line will remain the same, the availability and cost of material handling labor, the availability of investment capital, and the volume of activity. Alternatives to be considered would be the modular storage drawer systems, gravity flow rack systems, multi-level mezzanine picking operations, cart picking from static shelves, cart picking from modular storage systems, man-aboard picking systems, carousel systems, stationary picker twin carousel systems, vertical carousel systems, automated item picking systems. While each of these material handling/order selection systems offers increased productivity, this comes at an increasing cost of capital asset investments and a lessening of flexibility for the individual operation to change the products being picked, operational procedures, and velocities upon which such a system is designed.

2. Inventory Movement

Going beyond the individual item selection and picking process, the next element of material handling is in the conveyance and sortation of cartons, whether they contain single SKU or multiple SKU's as a result of a pick pack process. Again, as a base line example, individual cartons once they have been packed at the

picking packing station can be moved and consolidated at a shipping dock by assembling the cartons on a pallet and then moving with a counter-balanced fork lift to the shipping dock. Exploring beyond the base line example, cartons can be more expediently transported to the shipping point using conveyors either gravity fed or "live" motorized conveyor systems. Conveyors can be used as a mere means of transport from a packing station to a shipping dock or they can encompass consolidation lanes and sortation devices that will allow packages to be sorted into least cost transportation modes, zones, and/or specific destinations. Such transport conveyors can include direct loading into individual truck docks, and awaiting vehicles reducing the amount of manpower needed in the shipping process and on individual loading docks. Again, the selection of conveyors and sortation devices is impacted upon by velocity, availability of material handling capital and the loss of flexibility associated with such automated systems. Some of the methods of sortation for consideration would be: deflectors, push diverters, rake pullers, moving slat sorters, pop up skewed wheels, pop up belts and chains, pop up rollers, tilting slat sorters, tilting tray sorters, cross belt sorters, accumulation lanes, and chutes.

Comparison of picking methods:

Factor	Pick-to-cart	Pick-to-tote	Man-aboard Vehicle	Horizontal Carousel	Vertical Carousel	Mini-load AS/RS	Automatic Picker	Batch Picking
Pick rate Lines/hr.	25-125	100-350	25-250	50-250	50-350	25-100	500-1,000	300-500
Storage Cost (\$/ft.)	\$5-15	\$5-15	\$5-15	\$20-25	\$40-70	\$30-40	N/A	\$5-15
Picking accuracy	Medium	Medium	Medium	Medium	High	High	High	Medium
Maintenance requirements	Low	Medium	High	Medium	Medium	High	High	High
Human factors	Below average	Below average	Average	Above average	Excellent	Excellent	Excellent	Below average
Item security	Low	Low	Low	Medium	High	High	High	Low
Item Security	Low	Low	Low	Medium	High	High	High	Low
Reconfigurability	High	Medium	Low	Low	Low	Low	Low	Low

Source: Distribution Design Institute

3. Information

In addition, to the material handling automation and technology that physically moves and selects product, a growing area is developing in the technology associated with information planning and scheduling. As a baseline standard a warehouse would typically generate an individual pick list which an order picker would use to go to a specific stock keeping location to select the corresponding number of items which would then be taken to a checking packing station. This individual pick list is used to check the contents of the picked order to make sure it conforms to the actual order placed by the consumer. After this has been completed a paper bill of lading or freight bill is prepared which is used for routing and the shipping of the individual shipment. Moving from the base line we find more and more use of such things as bar code readers to transfer data from the pick list and/or read UPC codes from the individual items being picked. Laser scanner devices verify stock keeping units as they are picked and locations from which they are withdrawn and identify shipping cartons in which part are placed. On-board computer terminals linked by RF (Radio Frequency) systems allow instantaneous transmittal of information thus alleviating the need for "paper" in the warehouse, eliminating pick lists, bills of lading, and freight bills. Voice input/output devices further enhance data collection. Many of these devices can be used both alone and in combination with one another can create "paperless warehouse environments" and increase productivity. While the historic cost of these devices has been quite high, the cost of information and information technology is rapidly declining to such a point that its use will be drastically increased in non-traditional retail fulfillment environments of the future.

4. Future Trends

Future trends of material handling equipment fall in two categories: one, for the physical handling of material, and two, information technology advances. The physical material handling equipment continues to be justified based upon volume, economics associated with labor versus capital equipment costs, while the per unit pick costs are lessened by the use of automation, the payoff based upon high volumes and utilization drastically reduces flexibility. The second area, information technology, continues to show substantial growth in the non-traditional retail fulfillment environment. The need to maintain inventory accuracy, pick accuracy, and the benefits associated with real time inventory transactions demands the substitution of low cost information for the higher costs of inventory errors.

Customer requirements for 100% inventory accuracy with declining order cycle times will require faster order selection assembly and shipping cycles. Increased order accuracy with shorter cycle times are essential while distribution operations management

continues to try to minimize costs. The strongest emphasis is upon the quality measures of order accuracy while at the same time lowering the speed of the order cycle. Additional competitive pressures are making the handling costs an area of mandatory cost reduction. Material handling systems and inventory technology impact speed, accuracy, and cost.

5. Possible Future Changes

Increased use of information technology resulting in the trade off of information for inventory potentially will reduce the total number of warehouse distribution facilities, thus increasing the through-put of the remaining individual facilities. Such increases of through-put would cost justify substantial strides in material handling equipment and further information technology.

6. Competency of Current Operations

Competencies vary tremendously from specific proprietary operations run by large catalog retailers with state of the art order picking and sortation systems to manual third party and/or in-house startup operations. The state of the art installations have been custom designed to fit a specific set of requirements and SKU's while their productivity and cost per unit are quite attractive, they often are restricted to process only the type of goods for which they were designed.

ABOUT THE AUTHOR

Thomas L. Freese is principal of Freese & Associates, Inc. a management and logistics consulting firm in Chagrin Falls, Ohio. Mr. Freese received his B.S. in business administration and marketing, and an M.B.A. with a concentration in business logistics, from The Ohio State University. His experience spans a wide spectrum of products and industries, from bulk chemicals to consumer goods, frozen fruit, and fresh poultry. He has consulted to numerous manufacturers, wholesalers, and retailers. He is an active member of the Association of Transportation Law, Logistics and Policy (ATLLP), the Council of Logistics Management (CLM), the International Customer Service Association (ICSA), and Warehousing Education and Research Council (WERC). He is a frequent speaker at professional conferences and seminars and has contributed articles to the *Journal of Business Logistics*, *Traffic Management*, *Food Business*, and *Distribution Center Management*. and authors a regular column in *Warehousing Management* magazine. His chapter on "Warehouse Site Selection" appears in *The Logistics Handbook* published by Free Press and his chapter on "Third Party Warehousing" is a part of *The Warehouse Management Handbook*, Tompkins Press