WAL-MART'S SUPPLY CHAIN MANAGEMENT PRACTICES

OPER - 020

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This case was written by **P. Mohan Chandran,** under the direction of **Vivek Gupta,** ICFAI Center for Management Research (ICMR). It is intended to be used as a basis for class discussion rather than to illustrate either effective or ineffective handling of a management situation.

The case was compiled from published sources.

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"When you start to collapse the supply chain, accuracy in execution becomes critical. Any lack of accurate information and processes creates costly bottlenecks in the flow of goods and materials."

-- Bruce Richmond, Global head, Andersen Consulting.

INTRODUCTION

The US-based Wal-Mart ranked first in the global Fortune 500 list in the financial year 2001-02 earning revenues of $219.81 billion (Refer Table I). Wal-Mart was the largest retailing company in the world. The company was much bigger than its competitors in the US – Sears Roebuck, K-Mart, JC Penney and Nordstrom combined (Refer Exhibit I). In 2002, Wal-Mart operated more than 3,500 discount stores, Sam's Clubs and Supercenters in the US and more than 1,170 stores in all major countries across the world. The company also sold products on the Internet through its website, walmart.com.

TABLE I
GLOBAL FORTUNE 500 LIST (2002)

Rank	Company	Revenues (in $ millions)
1	Wal-Mart Stores	219,812.0
2	Exxon Mobil	191,581.0
3	General Motors	177,260.0
4	Ford Motor	162,412.0
5	Enron	138,718.0

Source: www.fortune.com

Wal-Mart was one of the largest private sector employers in the world, with employee strength of approximately 1.28 million. The company's founder, Sam Walton (Walton) had always focused on improving sales, constantly reducing costs, adopting efficient distribution and logistics management systems and using innovative information technology (IT) tools.

According to analysts, Wal-Mart was able to achieve a leadership status ((Refer Exhibit II)) in the retail industry because of its efficient supply chain management practices. Captain Vernon L. Beatty, aide-de-camp to the commander, Defense Supply Center, Columbus, Ohio said, "Supply chain management is moving the right items to the right customer at the right time by the most efficient means. No one does that better than Wal-Mart."

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BACKGROUND NOTE

Walton was born in 1918 at Kingfisher, Oklahoma, US. After graduating from the University of Missouri in 1940, Walton worked for the famous retailer, J C Penney. In his first job, Walton had displayed the qualities of a good salesman. He realized the importance of building loyalty among customers as well as employees. In the mid 1940s, Walton gave up his job and decided to set up his own retail store. He purchased a store franchise from Ben Franklin in Newport, Arkansas. It was here that he learnt his first lessons in retailing – offering significant discounts on product prices to expand volumes and increase overall profits. The business was successful and Walton soon acquired a second store within three years.

Walton not only looked for opportunities to open stores in other small towns but also explored the possibility of introducing innovative practices such as self-service. As the need for people to manage his stores increased, Walton tried to attract talented and experienced people from other stores. By 1969, Walton had established 18 Wal-Mart stores, reporting an annual sale of $44 million. In mid 1970s, Wal-Mart acquired 16 Mohr-Value stores in Michigan and Illinois. By the late 1970s, the retail chain had established a pharmacy, an auto service center, and several jewellery divisions.

In the 1980s, Wal-Mart continued to grow rapidly due to the huge customer demand in small towns, where most of its stores were located. Commenting on the growth of Wal-Mart, Walton said: "When we arrived in these small towns offering low prices every day, customer satisfaction guaranteed, and hours that were realistic for the way people wanted to shop, we passed right by that old variety store competition, with its 45 percent mark ups, limited selection and limited hours." Wal-Mart stores were located at a convenient place in a big warehouse-type building and targeted customers who bought merchandise in bulk. Customers could buy goods at wholesale prices by becoming members and paying a nominal membership fee. By 1984, there were 640 Wal-Mart stores in the US, generating sales of about $4.5 bn and accruing profit of over $200 mn.

Wal-Mart suffered a setback in 1992, when Walton died after a prolonged illness. But it continued its impressive growth in the 1990s, focusing more on establishing its stores overseas. In 1992, Wal-Mart expanded its operations in Mexico by entering into a joint venture with Cifra. Two years later, the company acquired 122 Woolco stores from Woolworth, Canada. By 1997, Wal-Mart had become the largest volume discount retailer in Canada and Mexico. In 1997, Wal-Mart acquired the 21-store German hypermarket chain, Wertkauf. Other international expansion efforts included the purchase of Brazilian retailer Lojas Americans' 40 percent interest in their joint venture, and the acquisition of four stores and additional sites in South Korea from Korea Makro. In January 1999, Wal-Mart expanded its German operations by buying 74 stores of the hypermarket chain, Interspar. The stores were acquired from Spar Handels AG, which owned multiple retail formats and wholesale operations throughout Germany.

By 2002, Wal-Mart had emerged as the largest company in the world in terms of revenues. Analysts felt that Wal-Mart had come a long way since 1979, when the company generated annual revenues of more than a billion dollar for the first time. By 1993, the company was doing a billion dollar business in a week and by 2001, it was crossing the billion dollar mark in every 1.5 days. Analysts attributed this phenomenal growth to Wal-Mart's continued focus on customer needs and reducing costs through efficient supply chain management practices. The company was able to offer a vast range of products at the lowest costs in the shortest possible time. This was possible mainly due to two factors – Wal-Mart's highly automated distribution centers, which significantly reduced shipping costs and time, and its computerized inventory system, which speeded up the checking out time and recording of transactions.

MANAGING THE SUPPLY CHAIN

PROCUREMENT AND DISTRIBUTION

Wal-Mart always emphasized the need to reduce its purchasing costs and offer the best price to its customers. The company procured goods directly from manufacturers, bypassing all intermediaries. Wal-Mart was a tough negotiator on prices and finalized a purchase deal only when it was fully confident that the products being bought were not available elsewhere at a lower price. According to Claude Harris, one of the earliest employees, "Every buyer has to be tough. That is the job. I always told the buyers: 'You are negotiating for your customer. And your customer deserves the best prices that you can get. Don't ever feel sorry for a vendor. He always knows what he can sell, and we want his bottom price. 'We would tell the vendors,' Don't leave in any room for a kickback because we don't do it here. And we don't want your advertising program or delivery program. Our truck will pick it up at your warehouse. Now what is your best price?"

Wal-Mart spent a significant amount of time meeting vendors and understanding their cost structure. By making the process transparent, the retailer could be certain that the manufacturers were doing their best to cut down costs. Once satisfied, Wal-Mart believed in establishing a long-term relationship with the vendor. In its attempt to drive hard bargains, Wal-Mart did not even spare big manufacturers like Procter & Gamble (P&G). However, the company, generally, preferred local and regional vendors and suppliers.

In 1998, Wal-Mart had over 40 distribution centers located at different geographical locations in the US. Over 80,000 items were stocked in these centers. Wal-Mart's own warehouses directly supplied 85 percent of the inventory, as compared to 50-65 percent for competitors. According to rough estimates, Wal-Mart was able to provide replenishments within two days (on an average) against at least five days for competitors. Shipping costs for Wal-Mart worked out to be roughly 3 percent as against 5 percent for competitors.

Each distribution center was divided into different sections on the basis of the quantity of goods received and was managed the same way for both cases and palletized goods. The inventory turnover rate was very high, about once every two weeks for most of the items. Goods meant for distribution within the US usually arrived in pallets, while imported goods arrived in re-usable boxes or cases. In some cases, suppliers delivered goods such as automotive and drug products directly to the stores. About 85% of the goods which were available at the stores passed through the distribution centers.

The distribution centers ensured a steady and consistent flow of products to support the supply function. As Wal-Mart used sophisticated barcode technology and hand-held computer systems, managing the center became easier and more economical. Every employee had an access to real-time information regarding the inventory levels of all the products in the center. They had to just make two scans – one to identify the pallet, and the other to identify the location from where the stock had to be picked up. Different barcodes were used to label different products, shelves and bins in a center. The hand-held computer guided an employee with regard to the location of a particular product from a particular bin or shelf in the center. When the computer verified the bin and picked up a product, the employee confirmed whether it was the right product or not. The quantity of the product required from the center was entered into the hand-held computer by the employee and then the computer updated the information on the main server.

The hand-held computer also enabled the packaging department to get accurate information about the products to be packed. It displayed all information about the storage, packaging and shipping of a particular product thus, saving time on unnecessary paperwork. It also enabled the center

supervisors to monitor their employees closely enabling them to give directions and even guide them even on the move. This enabled the company to satisfy customer needs quickly and improve the level of efficiency of the distribution center management operations.

Each distribution center had facilities for maintaining personal hygiene such as shower bath and fitness centers. It also had provision for food, sleep and personal business. The distribution center could also be used for meetings and paperwork. The truck drivers of Wal-Mart sometimes availed these facilities.

LOGISTICS MANAGEMENT

An important feature of Wal-Mart's logistics infrastructure was its fast and responsive transportation system. The distribution centers were serviced by more than 3,500 company owned trucks. These dedicated truck fleets allowed the company to ship goods from the distribution centers to the stores within two days and replenish the store shelves twice a week. The truck fleet was the visible link between the stores and distribution centers. Wal-Mart believed that it needed drivers who were committed and dedicated to customer service. The company hired only experienced drivers who had driven more than 300,000 accident-free miles, with no major traffic violation.

Wal-Mart truck drivers generally moved the merchandise-loaded trailers from Wal-Mart distribution centers to the retail stores serviced by each distribution center. These retail stores were considered as customers by the distribution centers. The drivers had to report their hours of service to a coordinator daily. The coordinator scheduled all dispatches depending on the available driving time and the estimated time for travel between the distribution centers and the retail stores. The coordinator informed the driver of his dispatches, either on the driver's arrival at the distribution center or on his return to the distribution center from the retail store. The driver was usually expected to take a loaded truck trailer from the distribution center to the retail store and return back with an empty trailer. He had to dispatch a loaded truck trailer at the retail store and spend the night there. A driver had to bring the trailer at the dock of a store only at its scheduled unloading time, no matter when he arrived at the store. The drivers delivered the trailers in the afternoon and evening hours and they would be unloaded at the store at nights. There was a gap of two hours between unloading of each trailer. For instance, if a store received three trailers, the first one would be unloaded at midnight (12 AM), the second one would be unloaded at 2 AM and the third one at 4 AM.

Although, the trailers were left unattended, they were secured by the drivers, until the store personnel took charge of them at night. Wal-Mart received more trailers than they had docks, due to their large volume of business.

Wal-Mart maintained a strict vigil over its drivers by keeping a record of their activities through the "Private Fleet Driver Handbook" (Refer Exhibit III). The purpose of the book was to educate the drivers with regard to the code of conduct. It also included the terms and conditions regarding the safe exchange of trailers with the store personnel and the safety of Wal-Mart's property. This book also contained a list of other activities, the non-compliance of which would result in the termination of the driver.

To make its distribution process more efficient, Wal-Mart also made use of a logistics technique known as 'cross-docking.' In this system, the finished goods were directly picked up from the manufacturing plant of a supplier, sorted out and then directly supplied to the customers. The system reduced the handling and storage of finished goods, virtually eliminating the role of the distribution centers and stores. There were five types of cross-docking (Refer Exhibit IV).

In cross docking, requisitions received for different goods from a store were converted into purchase or procurement orders. These purchase orders were then forwarded to the manufacturers who conveyed their ability or inability to supply the goods within a particular period of time. In cases where the manufacturer agreed to supply the required goods within the specified time, the goods were directly forwarded to a place called the staging area. The goods were packed here according to the orders received from different stores and then directly sent to the respective customers.

To gain maximum out of cross-docking, Wal-Mart had to make fundamental changes in its approach to managerial control. Traditionally, decisions about merchandising, pricing and promotions had been highly centralized and were generally taken at the corporate level. The cross-docking system, however, changed this practice. The system shifted the focus from "supply chain" to the "demand chain," which meant that instead of the retailer 'pushing' products into the system; customers could 'pull' products, when and where they needed. This approach placed a premium on frequent, informal cooperation among stores, distribution centers and suppliers with far less centralized control than earlier.

INVENTORY MANAGEMENT

Wal-Mart had developed an ability to cater to the individual needs of its stores. Stores could choose from a number of delivery plans. For instance, there was an accelerated delivery system by which stores located within a certain distance of a geographical center could receive replenishment within a day.

Wal-Mart invested heavily in IT and communications systems to effectively track sales and merchandise inventories in stores across the country. With the rapid expansion of Wal-Mart stores in the US, it was essential to have a good communication system. Hence, Wal-Mart set up its own satellite communication system in 1983. Explaining the benefits of the system Walton said, "I can walk in the satellite room, where our technicians sit in front of the computer screens talking on the phone to any stores that might be having a problem with the system, and just looking over their shoulders for a minute or two will tell me a lot about how a particular day is going. On the screen, I can see the total of the day's bank credit sales adding up as they occur. If we have something really important or urgent to communicate to the stores and distribution centers, I, or any other Wal-Mart executive can walk back to our TV studio and get on that satellite transmission and get it right out there. I can also go every Saturday morning around three, look over these printouts and know precisely what kind of work we have had."

Wal-Mart was able to reduce unproductive inventory by allowing stores to manage their own stocks, reducing pack sizes across many product categories, and timely price markdowns. Instead of cutting inventory across the board, Wal-Mart made full use of its IT capabilities to make more inventories available in the case of items that customers wanted most, while reducing the overall inventory levels. Wal-Mart also networked its suppliers through computers. The company entered into collaboration with P&G for maintaining the inventory in its stores and built an automated re-ordering system, which linked all computers between P&G and its stores and other distribution centers. The computer system at Wal-Mart stores identified an item which was low in stock and sent a signal to P&G. The system then sent a re-supply order to the nearest P&G factory through a satellite communication system. P&G then delivered the item either to the Wal-Mart distribution center or directly to the concerned stores. This collaboration between Wal-Mart and P&G was a win-win proposition for both because Wal-Mart could monitor its stock levels in the stores constantly and also identify the items that were moving fast. P&G could also lower its costs and pass on some of the savings to Wal-Mart due to better coordination.

Employees at the stores had the 'Magic Wand,' a hand-held computer which was linked to in-store terminals through a radio frequency network. These helped them to keep track of the inventory in stores, deliveries and backup merchandise in stock at the distribution centers. The order management and store replenishment of goods were entirely executed with the help of computers through the Point-of-Sales (POS) system. Through this system, it was possible to monitor and track the sales and merchandise stock levels on the store shelves. Wal-Mart also made use of the sophisticated algorithm system which enabled it to forecast the exact quantities of each item to be delivered, based on the inventories in each store. Since the data was accurate, even bulk items could be broken and supplied to the stores. Wal-Mart also used a centralized inventory data system using which the personnel at the stores could find out the level of inventories and the location of each product at any given time. It also showed whether a product was being loaded in the distribution center or was in transit on a truck. Once the goods were unloaded at the store, the store was furnished with full stocks of inventories of a particular item and the inventory data system was immediately updated.

Wal-Mart also made use of bar coding and radio frequency technology to manage its inventories. Using bar codes and fixed optical readers, the goods could be directed to the appropriate dock, from where they were loaded on to the trucks for shipment. Bar coding devices enabled efficient picking, receiving and proper inventory control of the appropriate goods. It also enabled easy order packing and physical counting of the inventories.

In 1991, Wal-Mart had invested approximately $4 billion to build a retail link system. More than 10,000 Wal-Mart retail suppliers used the retail link system to monitor the sales of their goods at stores and replenish inventories. The details of daily transactions, which approximately amounted to more than 10 million per day, were processed through this integrated system and were furnished to every Wal-Mart store by 4 a.m., the next day. In October 2001, Wal-Mart tied-up with Atlas Commerce for upgrading the system through the Internet enabled technologies.

Wal-Mart owned the largest and most sophisticated computer system in the private sector. The company used Massively Parallel Processor (MPP) computer system to track the movement of goods and stock levels. All information related to sales and inventories was passed on through an advanced satellite communication system. To provide back-up in case of a major breakdown or service interruption, the company had an extensive contingency plan.

By making effective use of computers in all its company's operations, Wal-Mart was successful in providing uninterrupted service to its customers, suppliers, stockholders and trading partners.

THE BENEFITS REAPED

Wal-Mart strongly believed and constantly emphasized on strengthening its relationships with its customers, suppliers and employees. The company was very vigilant and sensed the smallest of changes in store layouts and merchandising techniques to improve performance and value for customers. The company made efforts to capitalize on every cost saving opportunity. The savings on cost were always passed on to the consumers, thereby adding value at every stage and process.

Wal-Mart also enjoyed the benefits of low transportation costs since it had its own transportation system which assisted Wal-Mart in delivering the goods to different stores within (or sometimes less than) 48 hours. Transportation costs for Wal-Mart were estimated at approximately 3% of the total costs as compared to 5% for their competitors. Having its own transportation system enabled Wal-Mart to replenish the shelves four times faster than its competitors.

Wal-Mart priced its goods economically and the prices varied from day to day. The company enjoyed good bargaining power as it purchased huge quantities. This enabled it to price its products competitively and pass on the benefits to the consumers. The company offered higher discounts than any other retailer and they earned good revenues in the form of higher volumes. Low pricing ensured that the sales volumes were high and consistent.

The benefits of an efficient supply chain management system included reduction in lead time,[1] faster inventory turnover, accurate forecasting of inventory levels, increased warehouse space, reduction in safety stock and better working capital utilization. It also helped reduce the dependency on the distribution center management personnel resulting in minimization of training costs and errors. The stock-out of goods and the subsequent loss arising out of it was completely eliminated.

Wal-Mart's supply chain management practices resulted in increased efficiency in operations and better customer service. It eliminated old stocks and maintained quality of goods. Bar coding and radio frequency technologies enabled accurate distribution of goods. Cross-docking also helped Wal-Mart to reduce inventory storage costs. It also helped to cut down the labor and other handling costs involved in the loading and unloading of goods.

QUESTIONS FOR DISCUSSION:

1. Wal-Mart has been able to achieve respectable leadership in the retail industry because of its focus on supply chain management. Discuss in detail the distribution and logistics system adopted by Wal-Mart.

2. The use of innovative information technology tools had benefited Wal-Mart's supply chain management. In the light of the above statement, briefly explain how IT benefited Wal-Mart's logistics and inventory management.

3. What were the supply chain management processes adopted by Wal-Mart and how far were they effective? Discuss.

4. What was the nature of benefits derived by Wal-Mart from the efficient supply chain management practices and how far it has contributed to its sustainable competitive advantage? Explain.

1 The time taken for goods to reach Wal-Mart stores from the place of manufacture.

EXHIBIT I

WORLD'S 25 LARGEST RETAIL COMPANIES BY SALES (2002)

Rank	Company Name	Country	Sector	2001 Sales (in mn Dollars)	Rank by Market Cap.
1	Wal-Mart	U.S.	Discount Store	217,800	1
2	Carrefour	France	Hypermarket	67,721	6
3	Ahold	Netherlands	Supermarket/Hypermarket	64,902	12
4	Home Depot	U.S.	Home improvement	53,553	2
5	Kroger	U.S.	Supermarket	50,098	13
6	Metro AG	Germany	Diversified	48,264	32
7	Target	U.S.	Discount Store/Department store	39,175	5
8	Albertson's	U.S.	Supermarket	37,931	20
9	Tesco	U.K.	Supermarket/Hypermarket	37,378	9
10	Sears, Roebuck	U.S.	Department store/General merchandise	35,847	14
11	Safeway	U.S.	Supermarket	34,301	15
12	Costco	U.S.	Wholesale club	34,137	11
13	Rewe Gruppe	Germany	Diversified	33,640	P
14	ITM Enterprises	France	Diversified	32,922	P
15	J.C.Penny	U.S.	Department store/Drug store	32,004	48
16	Aldi Gruppe	Germany	Food/Discount store	30,000	P
17	Edeka Gruppe (incl. AVA)	Germany	Diversified	29,392	P
18	J Sainsbury	U.K.	Supermarket/ Hypermarket	27,121	25
19	Pinault-Printemps-Redoute	France	Diversified	27,079	27
20	Walgreen	U.S.	Drug store	24,623	3
21	Leclerc	France	Diversified	24,195	P
22	Auchan	France	Hypermarket/ Diversified	23,478	P
23	Tengelmann Gruppe	Germany	Diversified	23,393	P
24	CVS	U.S.	Drug store	22,241	18
25	Lowe's	U.S.	Home Improvement	22,111	7

Source: www.chainstoreage.com

Note: *P: Privately owned

All amounts are in millions of U.S. dollars, using the average 2001 exchange rates. All data is corporate level for retail-diversified companies, excluding VAT and non-retailing revenue when available. The different businesses of Japanese Conglomerates are accounted for separately.

EXHIBIT II

THE STRENGTH OF WALMART

Yearly sales	$220 billion
Total employees across the globe	1.28 million
Number of stores worldwide	4,382
Number of Supercenters	1,060
Number of Sam's Clubs	495
Number of new stores opened in 2002	420
Number of suppliers	30,000
Number of Wal-Mart's in Texas (US)	316
Value of 100 shares of Wal-Mart (as on January 28, 2003) purchased in 1970 @ $16.50 per share	$11.5 million
Wal-Mart's rank/position among all retailers in the US (in terms of grocery sales)	1
Wal-Mart's rank in jewellery sales	1
Number of pallets shipped by Wal-Mart truck every week	50 million
Annual sales of hot dogs by Wal-Mart every year (approx)	70 million
Percentage of dry dog food bought by Wal-Mart in the US	35%
Total occupied floor area of Wal-Mart	18.3 square miles
Percentage of toothpaste bought by Wal-Mart	24%
Yearly advertising expenditure	$498 million
Yearly purchase of gold for Wal-Mart by its suppliers	18.4 metric tonne
Highest one-day sales record till date (November 23, 2001)	$1.25 billion
Number of Learjets owned by Wal-Mart	18
Number of pilots owned by Wal-Mart	60
Number of employees employed by Wal-Mart in China	4000
Yearly sales of 850 McDonalds stores that operate inside Wal-Mart stores	$1.3 billion
Number of customers everyday at Wal-Mart stores worldwide	15.7 million
Number of every day visitors at Wal-Mart's website, walmart.com	4, 50,000
Number of items stored by a Wal-Mart Supercenters	1,00,000
Items stored by walmart.com	6,00,000
Estimated market capitalization of Wal-Mart in 2020	$11.1 trillion

Source: www.business2.com.

EXHIBIT III

PRIVATE FLEET DRIVER HANDBOOK

Wal-Mart's Private Fleet Driver Handbook contained terms and conditions with regard to termination of the truck drivers. According to the Wal-Mart's Private Fleet Driver Handbook, a driver could be terminated from his job if he refused to deliver an assignment given to him. However, if a driver refused to deliver the assignment due to fatigue or insufficient rest, the refusal was not considered as a violation. This book included other rules, the violation of which would result in immediate termination of the driver. This book was maintained by Wal-Mart to create awareness about the role, duties and responsibilities of a driver towards the company, society and profession in various situations. The expected actions of each driver and the 'code of behavior' was clearly detailed in this handbook and the driver had to strictly adhere to these rules and regulations. However, drivers were not terminated simply because they violated the rules and terms mentioned in the handbook. The facts, circumstances, situations and other collaborative evidence were taken into account and thoroughly assessed to decide about the termination. When a driver violated a rule or 'code of behavior', he was not terminated immediately, but was first taught the correct code of behavior by Wal-Mart.

For example, though the handbook mentioned that drivers had to be very polite and kind while dealing with the store personnel and others, a driver was not terminated for being rude. Instead, he was given a warning and asked to behave properly. He was terminated only when he showed no improvement. The drivers were also required to secure the truck trailers at the time of delivering them to the stores. The inability or failure to do so was not considered as a breach of contract that would result in immediate termination. However, a driver was once terminated from his job (in the year 2000) by Wal-Mart's then Private Fleet Manager, Mr. Paul Darwin, (who took charge in 1998) for leaving a trailer unsecured at one of the stores near a highway.

Moreover, according to the rules mentioned in the handbook, the drivers should exchange the truck trailers in a totally 'safe and responsible' manner, so that neither the trailers are damaged during exchange or in transit, nor does it result in any loss to other people in the form of injury, etc. When a driver leaves an unloaded trailer in front of the Wal-Mart store for the store personnel to pick it up, he should ensure that the trailer is properly safeguarded and secured against a closed dock in the store. This would ensure that no other person would gain access to the unloaded trailers.

For Wal-Mart, an avoidable accident was a more severe offense than refusing to deliver an assignment for dispatch. Mr. Paul Darwin, the then Private Fleet Manager of Wal-Mart, once dismissed a driver for being involved in an accident that could have been avoided or prevented. However, the driver's dismissal was later withdrawn.

Source: U.S. Dept. of Labor, www.oalj.dol.gov

EXHIBIT IV

TYPES OF CROSS DOCKING

Opportunistic Cross docking
In this method of cross docking, exact information about where the required good was to be shipped and from where it has to be procured and the exact quantity to be shipped, was needed. This method of cross docking enabled the company to directly ship the goods needed by the retail customers, without storing them in the warehouse bins or shelves. Opportunistic cross docking could also be used when the warehouse management software, installed by the retailer, alerted him that a particular product was ready for moving and could be moved immediately.

Flow-through Cross docking
In this type of cross docking, there was a constant inflow and outflow of goods from the distribution center. This type of cross docking was mostly suitable for perishable goods, which had a very short time span, or goods that were difficult to be stored in the warehouses. This cross docking system was mostly followed by the supermarkets and other retail discount stores, especially for perishable items.

Distributor Cross docking
In this type of cross docking, the manufacturer delivered the goods directly to the retailer. No intermediaries were involved in this process. This enabled the retailer to save a major portion of the costs in the form of storage. As the retailer did not need to maintain a distribution center for storing various kinds of goods, he helped him save warehouse costs. The lead time for the delivery of goods from the manufacturer to the consumer was also drastically reduced. However, this method had some disadvantages too. The transportation costs for both the manufacturer and the retailer tended to increase over a period of time, when the goods were required to be transported to different locations several times. Moreover, the transportation system had to be very fast. Otherwise, the very purpose of cross docking was lost. The transportation system should also be highly responsive and take the responsibility for the delays in delivery of the goods. The retailer was at a greater risk. He lost the advantages of sharing the risks with the manufacturer. This type of cross docking was suitable only for those retailers who had a large distribution network and could be used in situations when goods had to be delivered in a short span of time.

Manufacturing Cross docking
In Manufacturing cross docking, these cross docking facilities served the factories and acted as temporary and "mini warehouses." Whenever a manufacturing company required some parts or materials for manufacturing a particular product, it was delivered by the supplier in small lots within a very short span of time, just when it was needed. This helped reduce the transportation and warehouse costs substantially.

Pre-Allocated Cross Docking
Pre-allocated cross docking is very much like the usual cross-docking, except that in this type of cross docking, the goods are already packed and labeled by the manufacturer and it is ready for shipment to the distribution center from where it is sent to the store. The goods can be delivered by the distribution center directly to the store without opening the pack of the manufacturer and re-packing the goods. The store can then deliver the goods directly to the consumer without any further re-packing. Goods received by the distribution center or the store are directly sent into the outbound shipping truck, to be delivered to the consumer, without altering the package of the good. Cross docking requires very close co-ordination and co-operation of the manufacturers, warehouse personnel and the stores personnel. Goods can be easily and quickly delivered only when accurate information is available readily. The information can be managed with the help of Electronic Data Interchange (EDI) and other general sales information.

Source: Compiled by ICMR through sources including web.nps.navy.mil, colby.com.au, wiralogistics.com and tli.isye.gatech.edu

ADDITIONAL READING AND REFERENCES:

1. Ortmeyer, K.Gwendolyn, and Lattin M. James, **"A Theoretical Rationale for Every Day Low Pricing by grocery retailers,"** Stanford Graduate School of Business, 1991.
2. **"Distribution and Retailing in China – Revolution and Competition"**, www.alberta.org, November 12, 1996.
3. Rowat, Christine, **"Cross docking: The move from supply to demand"**, www.dmg.co.uk, August 1998.
4. Hulet, D.William, **"Global Warming and Wal-Mart, Why global warming is a municipal government concern**", www.elements.nb.ca, September 1998.
5. **"Cross Docking and Cross Docking Network Design"**, www.tli.isye.gatech.edu, 1998-99.
6. **"Cross docking delivers for Retail",** www.spscommerce.com, 1999.
7. Harrington, Lisa, "**Digital Age warehousing,"** Penton Media, www.industryweek.com, July 19, 1999.
8. **"Distribution strategies, Supply Chain analysis at Volkswagen of America,"** www.eng.auburn.edu, 2000.
9. O'Brien, P. Kevin, **"Value Chain Report- Warehouse Management Systems Add Value,"** www.industryweek.com, www.iwvaluechain.com, February 10, 2000.
10. Weiscott, N. Maria, **"Warehouse Evolution: High Tech Developments Get Industry Cooking",** Plants, sites and parks magazine, www.bizsites.com, February/March, 2000.
11. **"Cross-docking in the U.K,"** Siemens Dematic, www.siemensdematic.com.au, 2001.
12. **"What is cross docking?**, The Warehouse Word, www.colofwhousing.com.au, 2001.
13. Colosino, Robert and Medwyk, Nicholas, **"Wholesale Distribution, Managing complex supply chain requirements in the foodservice industry,"** wholesaledistribution.services.ibm.com, April 11, 2001.
14. Daudelin, Alexandre, **"Supply Chain Management the Wal-Mart Way,"** Supply Chain and Logistics Journal, **www.infochain.org,** April 21, 2001.
15. **"Wal-Mart.com: The Physical giant goes Virtual,"** Red Herring Magazine, www.redherring.com, May 7, 2001.
16. Hutten, Staffen and Nyberg, Anna, **"Voluntary retail chains and the threats and opportunities of European Integration,"** www.snee.org, May 15, 2001.
17. **"It's not only the retail side, Wal-Mart Distribution"**, www.Wal-Martwatch.com, January 6, 2002.
18. **"Stauffer V Wal-Mart stores, Inc**., www.oalj.dol.gov, June 14, 2002.
19. Coyle, J. John, Bardi, J. Edward, Langley, C. John, **"The Management of Business Logistics: A Supply Chain Prospective,"** www.house.gov, June 25, 2002.
20. **"Thrify Wal-Mart Partner for Flat Rate Rental Plan,"** Auto Rental News, www.autorentalnews.com, July 29, 2002.
21. "**Trans-loading, Cross docking,"** www.commoditylogistics.com, October 23, 2002.