

Who Stocks the Shelf? An Analysis of Retail Replenishment Strategies

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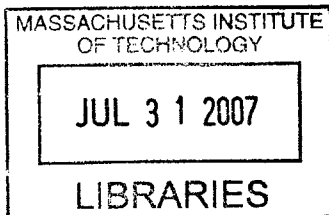
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Abstract

The objective of this thesis is to analyze the trade-offs of two retail replenishment strategies, DSD (Direct Store Delivery) model and Traditional model. Conceptual and cost models are set up to analyze the trade-offs, and numerous interviews were conducted to obtain insights from academic scholars and industry practitioners. Retail products, retailers and suppliers are categorized according to their synthesized attributes. Based on such categories, retail replenishment strategies are tested to determine which categories are more suitable for DSD or traditional strategies. Besides qualitative analysis on tradeoffs of alternatives, quantitative cost models are built to quantify the tradeoffs between alternatives.

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Interviews with industry practitioners are critical in forming and testing hypothesis in the process of this research project. I hereby would like to extend sincere thanks to Sean Stucker, Roger Porter and Tracy Mickelson, who sponsored the project and provided great help in every aspect during the course of this research. I would also like to thank many other industry leaders who helped to provide their insights on the topic, including, Mark Jamison, VP Customer Supply Chain, Kimberly-Clark Corporation, Simon Osborn, Vice President CDC and Logistics, 7-Eleven Stores, and Neil Theiss, Assistant VP Supply Chain Management, SYSCO Corporation.

I would also like to thank my classmates Harikumar Iyer and Saurabh Prasad for providing me with lots of insights from their extensive experience. Meanwhile, this research couldn't have been completed without the generous help and information given by industrial practitioners, academic experts and my previous colleagues in McKinsey & Company and Accenture. I hereby would like to express my sincere thanks to all of you.

Biographical Note

Before joining MLOG program, Philip Jiaqi Kuai worked as consultant with travel and logistics practice in McKinsey & Company, and supply chain service line in Accenture. Prior to that, Philip was an intern analyst with Maersk Data Consulting for two years.

As consultant with a strong focus on logistics and supply chain management, Philip was deeply involved in over a dozen of consulting projects, from corporate strategy, value chain analysis, organization change, market entry strategy to investment due diligence, process re-engineering, supply chain transformation, sourcing strategy, etc. Besides these, Philip is a frequent contributor for a list of reputed professional journals and an active freelance consultant as well.

Originally from Shanghai, China, Philip completed his undergraduate studies in transportation and logistics at Tongji University in Shanghai, where he received a B.Eng.

Table of Contents

Abstract.....	2
Acknowledgements.....	3
Biographical Note.....	4
List of figures.....	6
List of Tables.....	6
1 Introduction.....	7
1.1 Literature Review.....	10
2 Comparison of Replenishment Models.....	19
2.1 Traditional Replenishment Process.....	19
2.2 DSD Replenishment Process.....	22
2.3 The Selection between DSD and Traditional.....	26
2.3.1 What Products are Suitable for DSD?.....	27
2.3.2 What Retailers are Suitable for DSD?.....	29
2.3.3 What Suppliers are Suitable for DSD?.....	30
3 Pros and Cons of DSD and Traditional Replenishment Models.....	31
3.1 Pros of DSD Replenishment.....	31
3.2 Cons of DSD Replenishment.....	34
3.3 Pros of Traditional Replenishment.....	36
3.4 Cons of traditional Replenishment.....	37
4 Case Study: PLAZA and Hava’s in New England.....	38
4.1 DSD Practice of PLAZA in New England.....	38
4.2 Trade-off Analysis of DSD and Traditional Replenishment.....	41
5 Conclusions.....	50
Appendix.....	52
References.....	54

List of Figures

Figure 2.1 Traditional Replenishment – Material Flow.....	20
Figure 2.2 Traditional Replenishment – Business Process.....	21
Figure 2.3 Traditional Replenishment – Tour Mapping.....	21
Figure 2.4 DSD Replenishment – Business Process.....	24
Figure 2.5 DSD Replenishment – Material Flow.....	25
Figure 2.6 DSD Replenishment – Tour Mapping.....	26
Figure 4.1 PLAZA’s DSD network in New England area.....	41
Figure 4.2 DSD From PLAZA’s RDC to Hava’s Stores.....	43
Figure 4.3 Potential Traditional Warehouse Replenishment of Hava’s.....	46
Figure 4.4 Sales Increase Needed to Justify the Cost Gap.....	48

List of Tables

Table 4.1 Sales data of PLAZA’s Products in Hava’s Stores in 2006.....	42
Table 4.2 Annual DSD Cost of Hava’s.....	45
Table 4.3 Annual Traditional Cost of Hava’s.....	47

1 Introduction

Who should replenish retail chain stores? Suppliers, retailers, or someone else? And how? Such questions have become more and more important over the past few years as both suppliers and retailers are facing more pressure on bottom-line control and revenue growth. In current practice, many retail products, especially groceries, are replenished directly from suppliers to retail stores, through what is called DSD (Direct Store Delivery) replenishment. At the same time, retailers also distribute and replenish some product categories by themselves. In such cases, suppliers only deliver product to the retailers' distribution centers or warehouses, and the retailers manage the store level distribution and replenishment by themselves. This hybrid replenishment strategy of employing both DSD and traditional retailer warehouse models has been practiced for decades.

However, some major retail chains are taking initiatives to shift from DSD back to traditional replenishment for selected product categories, and such changes sometimes are not peaceful. For example, in early 2006, a group of Coca-Cola bottlers sued Coke and its largest bottler over plans to ship PowerAde drinks directly to Wal-Mart warehouses, rather than to individual retail locations as has been the case for a century in the beverage industry. [Ward, 2007]

Wal-Mart wanted to have product delivered to its warehouses, not stores. Coca-Cola, fearing Wal-Mart would launch its own sports drink to rival the Coca-Cola's

Powerade if it didn't agree to the retailer's new distribution terms, caved under the pressure and altered its own century-old supply system. Nearly 60 independent Coke bottlers filed a lawsuit against Coke and Coca-Cola Enterprises in 2006 over the plan. Independent bottlers, many family-owned, that have served Coke for generations, feared warehouse delivery of PowerAde would lead to a broader shift from the DSD system. The final landmark agreement freed Coke to develop its own new distribution systems

Besides the beverage supply chain, which received public attention due to the suit of Coca-Cola, other supply chains in the grocery industry are experiencing debate and change as well. Based in Laval, Quebec, Couche-Tard is Canada's largest chain of convenience stores, stocking more than 2,500 products at each of its 2,575 sites across Canada and the US Midwest. Until a few years ago, the company relied on wholesaler managed DSD replenishment to get these products onto shelves. To provide better control over the delivery process and make it possible to replenish individual stores more efficiently, the retailer decided to establish a single distribution center. Couche-Tard believed that to open its own warehouse would also allow it to take advantage of special offers from wholesalers, such as lower prices on vanload shipments or purchasing large quantities to hedge against price increases. Suppliers are now shipping goods to the distribution center rather than directly to the stores. [Shanahan, 2004]

Some major retailers like Wal-Mart put more weight on their own distribution networks versus suppliers'. At the same time, some giants from the supplier side, such as Kimberly-Clark, are initiating DSD services to their retail customers [Jamison, 2007]

Facing such a dynamic situation and potential major change on store replenishment strategy and flow of goods, both suppliers and retailers are very interested in a list of questions to understand the trade-offs between DSD and traditional channels:

- What is the value add for suppliers and retailers for going DSD?
- Does it improve customer service, merchandising, replenishment frequency, etc?
- Is it worth the investment from suppliers (in people, fleet, warehousing, and inventory) to provide these services?
- Are there certain customer, product or geographic segments where DSD should be limited?

This thesis addresses these questions using both qualitative and quantitative approaches. In order to gain a comprehensive view of the trade-offs between DSD and traditional network, while keeping the research work doable, the author and the sponsor PLAZA agreed to focus on a single product family and one large territory. This scope is representative and reasonable for a meaningful analysis.

In order to analyze the tradeoffs for retail replenishment alternatives, we created both conceptual and cost models and conducted numerous interviews. The conceptual models are set up to categorize retail products and retailers according to their attributes. Based on such categories, retail replenishment strategies are tested to determine which categories are more suitable for DSD model or traditional replenishment model. Besides qualitative analysis on tradeoffs of alternatives, quantitative cost models are built to estimate the cost differences between alternatives. Interviews with industry practitioners

and academic experts are critical in forming and testing hypotheses and synthesizing insights.

1.1 Literature Review

DSD is a well discussed topic in both business and academic publications. McEvoy [1997] argues that in most product categories, the benefits of DSD far outweigh its complexities. Manufacturers assume much of the distribution cost, while providing a valuable service. In return, manufacturers benefit from the ability to manage their portfolios of authorized SKUs while maintaining product quality. At the same time, retailers benefit from the guaranteed-sale format, while eliminating handling costs, inventory level and quality control.

Better employee incentive system is another widely mentioned benefit brought by DSD. Adams [1995] notes that the benefit of DSD is that employees are motivated to maximize sales. For example, a route driver paid on commission has incentives to do a better job of maximizing shelf turns. Adams also indicates that DSD and category management can help to improve the ability to restock the store for new product changes and major shelf set changes.

Huppertz [1999] suggests that DSD could be a valid approach for addressing smaller more frequent orders as long as the supplier could respond quickly and cost effectively. The author argues that inventory reduction and E-Commerce are driving

shipment size ever smaller and increasing frequency of shipments. Unfortunately, smaller, more frequent orders typically mean higher order management and distribution costs due to more transactions, increased handling, and smaller freight moves. There are ways to offset some of the cost increases. DSD or drop shipping allows trading partners to avoid the cost of handling smaller orders in a retailer's or a distributor's distribution center. Freight consolidation is an effective way to recoup some of the rising transportation costs associated with smaller shipment sizes.

Huppertz [1999] also indicates that sometimes the supplier might not be set up to handle small pick-pack types of orders and can not do so as efficiently as the retailer. The supplier must also be highly reliable in terms of shipping orders accurately and on time. Whether or not DSD actually could provide a cost or service advantage in a given situation requires careful assessment. Since transportation costs, delivery costs and store receiving costs typically would increase, the benefits could easily be offset. Besides the order size related discussion, Huppertz [1999] suggests that channel partners may employ DSD or drop shipping for products with short shelf life. Very short shelf life items can not afford to spend time flowing through extra distribution steps or sitting in a distribution center for any length of time. By eliminating a handling step, DSD may reduce product damages for certain sensitive products.

Some other articles add examples on how the products requiring special storage and handling could be good candidates to employ DSD strategy. Graham [2001] quotes the example of Dreyer's/Edy's Grand Ice Cream. According to Deborah Scarpace, Edy's

logistics director, DSD offers greater control at more supply points. Through their Direct Store Service program (DSS), Edy's employees take a hand in dispensing product at the level of the grocery store, and spend a good deal of time orienting non-employees in its proper management.

On the other hand, some authors point out that DSD is also facing tough challenges. One of the biggest challenges for DSD companies is determining the optimal service methods and frequencies to apply to each retail account. There are dozens of variations in selling, order generation, delivery and merchandising, as well as equipment configurations that DSD companies employ to serve their account base. Account profitability, the author suggests, which is defined as gross profits per account less the direct costs of service is commonly used as a guide for service decisions. The author also suggests that there are sophisticated software tools developed that can be applied to more precisely manage shelf-sets for product velocity, product profitability and distribution management. With such tools, distributors have the ability to use depletion rates - at a package and account level - to achieve a better balance of sales and distribution cost optimization. [Hjort, 2000]

Despite the benefits brought by DSD, some retailers are complaining about DSD services. Clark [2005] quotes remarks of Giant Eagle's Diane Roberts, director of merchandising systems. "Not bringing enough products in to meet demand, and bringing the wrong items in to meet demand" are two key problems that fall under DSD management related to the issue of out-of-stocks.

DSD is indeed facing both opportunities and challenges. Ryan [1995] argues that DSD presents the food distribution industry with a series of paradoxes, opportunities and challenges. On the one hand, DSD offers great promise, both as a way to ensure that fresh products are always on the shelf and as a significant step toward realizing the potential offered by micromarketing. On the other hand, DSD is also a distribution system that, in its current form, adds layers of complexity to backroom receiving and vendor/distributor relations and can be the primary cause behind the generation of mountains of invoices and receiving documents.

Many DSD related industry whitepapers and journal articles have strong focus on technology application as enabler in DSD improvement. It is widely agreed that technology is one of the major drivers changing the landscape of DSD.

Green, Richard, Wong, Angela [1995] suggest that DSD should be of prime interest to retailers as DSD offers a cost-effective approach for entrance into current industry movements to reengineer the supply chain. DSD systems, depending on their software, are accurately tracking vendor and item authorization, updating perpetual inventories and computer-assisted ordering, correctly calculating invoice totals while knowing retail price, cost, discounts, rebates, deposits, packs return to vendors and quantities. Computerized DSD can help reduce costs from the distribution process, and improve efficiency, automate operations, and provide a win-win relationship between suppliers and retailer by improving productivity.

Joseph [1992] indicates that after a period during which supermarket companies pursue other priorities, it appears that DSD is regaining momentum as a major strategic thrust. DSD is renewed through the smoothing of technology that allows the principles of electronic data interchange to be applied more efficiently to backdoor receiving. A pilot test of the Delivery Exchange (DEX) technology began in 1988 at Ralphs Grocery and proved successful enough that Ralphs implemented a fully automated receiving system in 16 stores in 1992. The real advantages of DEX would come through network transmission of invoices and other information. Opportunities for standard DSD policies and procedures exist at both the retail receiving and headquarters levels.

While most authors agree on the importance of technology, some argue that in long run, service will still be of strategic importance. Hampton [2006], director of customer delivery systems at Frito-Lay argues that technology and infrastructure pressures will continue to force DSD to evolve. But in the long run, service will be what sustains DSD's competitive advantage, and DSD suppliers will need to keep improving the DSD service performance.

Leading consulting firms also conducted analysis on DSD. According to The Boston Consulting Group (BCG), activity-based costing with a focus on contribution margin should be the prime measure of DSD's effectiveness. Activity-based costing analysis of the top 100 food categories in supermarkets underscored the fact that DSD categories accounted for 52% of store profit and 25% of store sales. However, studies clearly indicated that evaluating DSD items and warehoused items on the basis of gross margin could be grossly misleading, since these percentages did not

take all retail costs into account. The Boston Consulting Group measured the direct and incremental costs incurred by both manufacturers and retailers along the supply chain, and, by adding in such items as warehousing, delivery, merchandising and administrative costs, had come to the conclusion that contribution margin was the best calculation. In-store labor provided by DSD reps could translate into \$1 billion to \$2 billion annual cost avoidance for supermarkets, according to the study. [Lewis, 1998]

The Boston Consulting Group concluded that the essence of DSD might be summed up by the 3 S's - sales, service and satisfaction. These factors, which included such elements as efficient assortment, efficient replenishment, effective promotions and product introductions and merchandising, had been responsible for driving sales growth within the DSD distribution system. Overall, DSD was what the ECR (Efficient Consumer Response) movement was all about - a system that put category experts in a store every day and did not just substitute manufacturer labor for retailer labor. The consultancy argued that efficient assortment and replenishment, as well as effective promotions, product introductions and merchandising were driving DSD growth. DSD supplier representatives provided highly focused views of particular categories. "They have the trade area and national category data at their fingertips and a strong incentive to cull slow movers." [Lewis, 1998]

An activity-based costing model put together by Milton Merl & Associates and Stop & Shop found that the net contribution margin of DSD salty snacks was three times greater than warehouse-delivered product. The most persuasive evidence of the power of

DSD came from Canada, according to BCG, where some retailers had labor contracts that shut out DSD vendors by prohibiting non-union labor from touching the merchandise. [Lewis, 1998]

In the same study, the Boston Consulting Group concluded that, in general, DSD systems outperformed the systems employing traditional models when it came to such measures as return on working capital, sales turns, cash flow and return on assets and space. Overall, DSD products offered significantly higher returns in 5 key productivity measures. The study found that annual shelf turns for DSD salty snacks, soft drinks, and bread/baked goods was 2.7 times higher than for comparable warehouse-delivered products. The leading DSD cookies SKU sold more than four times as many units per store per week than the comparable warehouse product. [Lewis, 1998]

To develop a working analysis of the DSD value chain, a pilot program was conducted by Ernst & Young. The study concluded that the DSD value chain distribution channel was a conduit for moving high-velocity, high-bulk, perishable and specialty products from the manufacturer or manufacturer's agent directly to the retail shelf. The study was designed around 3 central objectives: the development of a common understanding of the key activities in the DSD value chain, the development of a measurement system for DSD chain activities and the development of a model to help identify key ideas for value chain improvement. The study determined that major DSD process inefficiencies could be found in formation gaps between suppliers and retailers and/or between functions within an organization. The largest DSD inefficiencies were

found in the areas of price discrepancies, invoice discrepancies, shipment of items and process requirements that strain relations between trading partners. According to Ernst & Young, there were four key causes of these inefficiencies: (1) The failure to use technology, inadequate training, poor operational discipline and execution, and the lack of jointly developed process requirements; (2) Conflict and process breakdowns, which resulted from differing business objectives between trading partners; (3) Measures for store receivers, route sales representatives, advance sales representatives and sales managers were not focused on DSD objectives and might reward one company or another at the expense of the process as a whole. (4) Lost cycle-time reduction opportunities as well as lost opportunities to reduce cost and improve quality were often the result of a "lack of ownership" of the DSD process. Additionally, the study found that the majority of the work currently being done in the DSD process was being done by the suppliers, and suppliers were currently spending approximately three times as much per store as retailers to perform DSD activities. [Anonymous, 1995]

Besides numerous business journal articles and consulting reports as mentioned above, more specifically, some papers discussed the trade-offs between DSD and traditional warehouse model. Chen, John, Narasimhan [2005] focus the study on the sports drink market, which features competing producers (All Sport, Powerade, and Gatorade) and heterogeneous channels (direct-store-delivery and independent wholesalers). The paper estimates demand and cost parameters for a number of alternative models of competitive interaction (horizontal as well as vertical), and then employs these estimates to study one possible channel switch, namely, switching

Gatorade from its extant (independent wholesaler) channel to DSD channel belonging to Pepsi. One key finding of the paper is that the large cost difference favors the wholesaler channel over the DSD channel in the abovementioned context, and that this efficiency effect outweighs the strategic effects from oligopolistic price competition.

After reviewing journal article, consulting reports and academic papers regarding DSD and traditional models in the past over ten years, there are some key insights: First, DSD can provide substantial value add to both retailers and suppliers and help to increase sales. The benefits of DSD include enabling better employee incentive system, providing a valid approach for addressing smaller more frequent orders, providing special storage and handling capabilities and providing better merchandising services. Second, DSD is also facing tough challenges because it adds layers of complexity to backroom receiving and vendor/distributor relations and could be the primary cause behind the generation of mountains of invoices and receiving documents. Third, technology applications can help to improve the efficiency of DSD and further promote the benefits.

The remainder of this thesis is organized as follows: First, a detailed comparison of business models of DSD and Traditional is conducted. Replenishment models are analyzed and recommended for products, retailers and suppliers with different characteristics. Second, pros and cons of DSD and Traditional replenishment models are discussed. Third, a case study is conducted to quantify the trade-offs on DSD and Traditional replenishment models. Lastly, based on the analysis, some insights are concluded and further research areas are introduced.

2 Comparison of Replenishment Models

This chapter first introduces the detailed processes of Traditional and DSD replenishment, and then discusses the selection between DSD and Traditional replenishment for different types of products, retailers and suppliers.

2.1 Traditional Replenishment Process

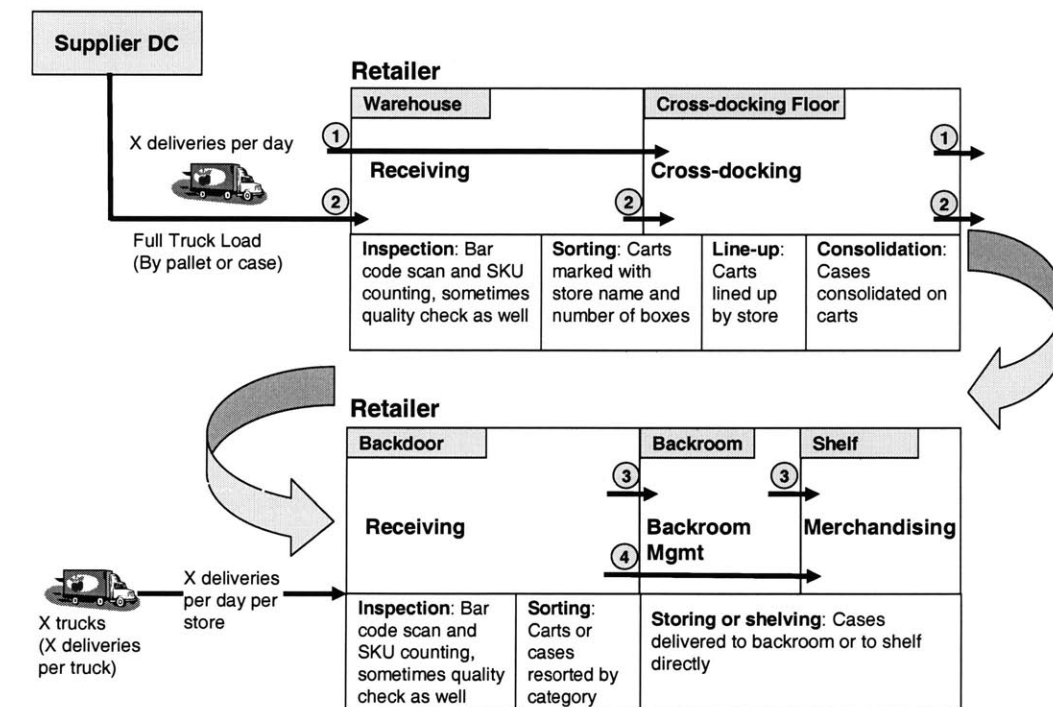
Traditional replenishment for retailers is where the supplier ships FTL (Full Truck Load) or nearly FTL to the retailer's warehouse or distribution center. As shown in the Figure 2.1, upon receipt, the retailer, together with the supplier's truck driver, will inspect the shipment to ensure it is the correct quantity and in good condition. Bar code is commonly used to automate the inspection process and verify quantity. The SKU received will then be updated in the system for inventory management purposes. The retailer warehouse will then sort and put the product away in assigned areas in the warehouse, as shown in the Figure 2.1.

Very often there is a cross-docking floor or area in the retail warehouse where cases of products are consolidated into carts for delivery to individual stores. Retailer managed route trucks will then load and ship these carts to individual stores. Such trucks and operations can be owned and managed by retailer or outsourced to third party trucking company.

Upon receiving at the backdoor of retail store, store staff will work with the truck driver to inspect the shipment and update inventory information. SKUs delivered will then be either stored temporarily in backroom or put directly on the shelf. The retail store staff will manage the merchandising process, including improving display, controlling shelf life, etc. Besides different distribution handlers, the different ownership of merchandising is the key difference between DSD and traditional replenishment.

Figure 2.1 Traditional Replenishment – Material Flow

TRADITIONAL REPLENISHMENT_MATERIAL FLOW

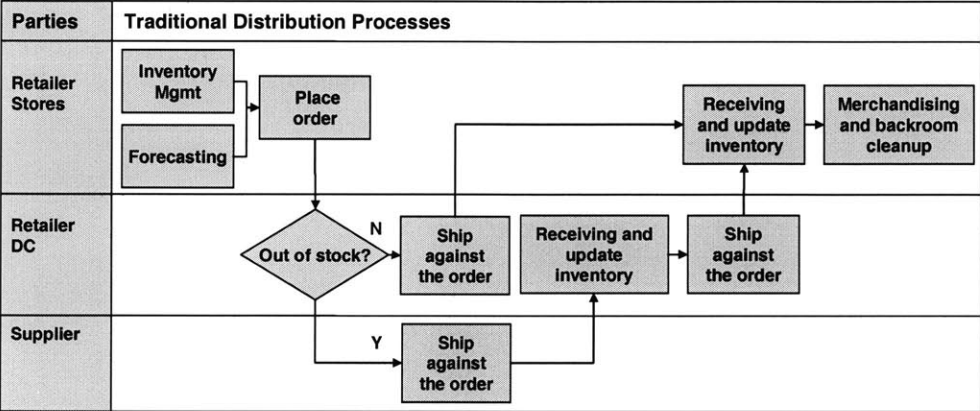


The business process of traditional replenishment is shown in Figure 2.2. Based on the inventory level and cycle forecasting, the retailer places orders for its stores. Upon receipt of the order, the retailer's DC will ship the products to stores as requested. If the

product requested is out of stock, the retailer’s DC will ask the supplier to send the product to the DC. And then the retailer’s DC will send the products requested to the stores. Upon delivery, staffs from the retailer’s DC and stores will work together to verify the shipment and conduct the merchandising work.

Figure 2.2 Traditional Replenishment – Business Process

TRADITIONAL REPLENISHMENT_BUSINESS PROCESS

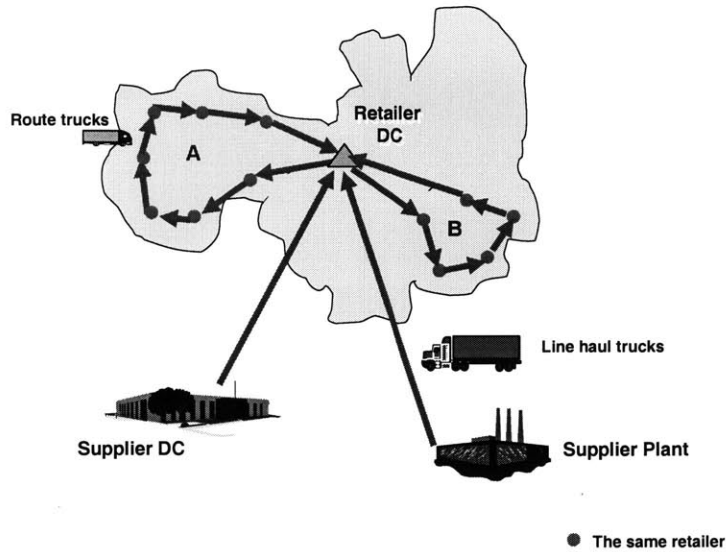


Source: Interviews

The tours of the retailer and supplier in the process of traditional replenishment are shown in Figure 2.3. The supplier first ships the products as requested by the retailer from the supplier DC or supplier plant to the retailer DC. From the retailer DC, the retailer then use route trucks to replenish each store.

Figure 2.3 Traditional Replenishment – Tour Mapping

TRADITIONAL REPLENISHMENT - TOUR MAPPING



Source: Interviews

2.2 DSD Replenishment Process

For Direct Store Delivery (DSD), the supplier will manage the majority of the replenishment process. Typically, a DSD supplier performs two functions: merchandising and delivery. These two tasks can be performed by one of two individuals.

DSD merchandisers have several key tasks in the process. First, on a regular base, normally twice a week, the merchandiser will visit the stores and review the on-hand inventory stored in the backroom of stores and on the store shelves, and recent

consumption in each store that he or she covers. Based on the most updated first hand inventory data and market intelligence collected through visiting stores, the merchandiser will forecast the demand for the next order cycle and then determine the product type and volume of the next order that the store should place. As shown in Figure 2.4, very often, the merchandiser will also place the order on behalf of retail stores, depending on the contract with retailers.

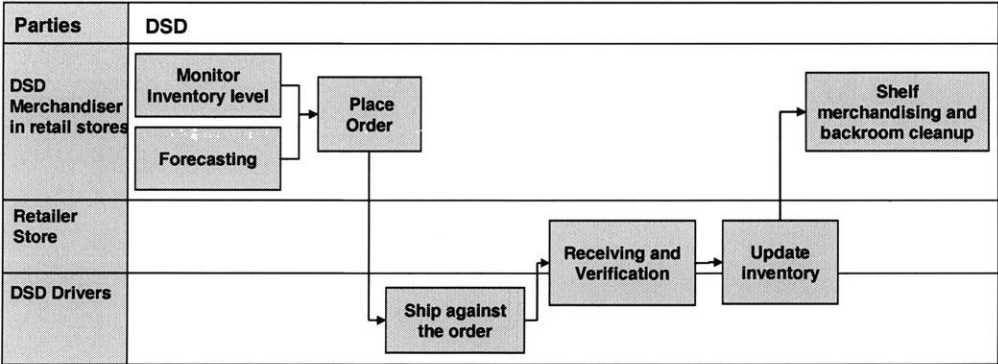
Additionally, the merchandiser has the responsibility of in-store merchandising. In the grocery industry, maximizing the revenue generated per square inch at floor space is the key to increase profitability. Because impulse buying is a major purchasing habit for many consumers, the shelf display and presentation can have a critical impact on sales performance. Frequent in-store review and merchandising can dramatically increase sales. At the same time, as many grocery products have short shelf life of several days or weeks, and freshness is often the critical attraction to customers, merchandisers monitor the store shelves and removes the obsolete or older products.

The delivery task is more straightforward. As shown in Figure 2.5, the product, ordered by either the DSD merchandiser or retailer is distributed from the supplier DC to the backroom of the store. Upon delivery, the truck driver will also need to work with retail store receivers to handle the unloading work and verify the receipt. Depending on the size of retail stores, products received will then be either stored in the backroom of retail stores and wait until merchandiser come and pick up, or delivered directly to shelves.

Both merchandisers and truck drivers will be allocated to certain regions or routes. The number of stores that each merchandiser and truck driver covers often varies. In most cases, especially in serving grocery stores and supermarkets, the two positions of merchandiser and truck driver will be assumed by different personnel due to the considerable workload required. For some convenience stores or small retail chains, which require quick delivery directly to shelves due to little or no space in the backroom, the two positions may be filled by the same person.

Figure 2.4 DSD Replenishment - Business Process

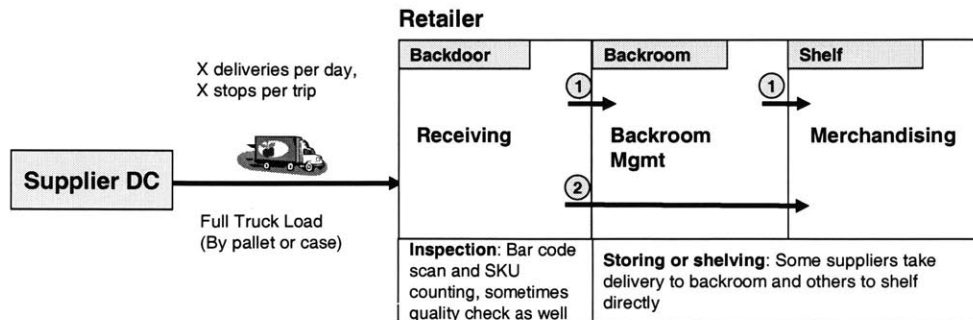
DSD REPLENISHMENT_BUSINESS PROCESS



Source: Interviews

Figure 2.5 DSD Replenishment – Material Flow

DSD REPLENISHMENT_MATERIAL FLOW

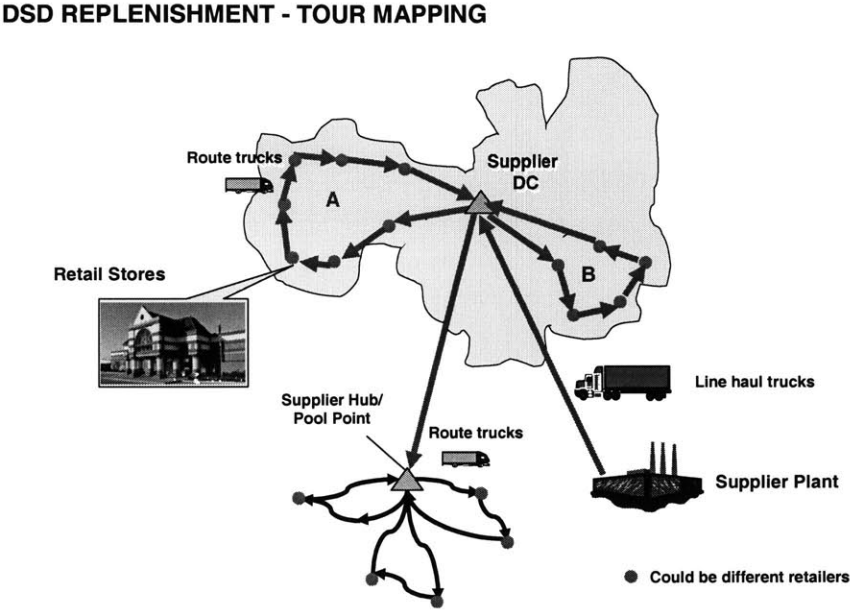


Source: Interviews

There are two general ways to organize DSD tours: Milk-runs and Pool points. Milk-runs are used to serve those retail stores close to the supplier distribution center (DC). A milk run is where the DSD driver will usually directly ship the cargos loaded at DC to multiple retail stores in neighbor regions in a planned sequence or tour. Pool points on the other hand, are where the supplier will ship a full-truck-load (FTL) of product from the DC to some regional dispatching point. At this dispatching point, usually a cross docking station or a parking lot, cargo is unloaded and transferred to local trucks with smaller capacity. And then, those local trucks will handle the local retail store delivery by milk-run. Sometimes, the trunk line trailer is simply dropped and another power unit picks it up for local delivery. The purpose of both distribution approaches is to leverage

the economy of scale while maintaining enough flexibility. Steps of the milk-run and trunk-line tours are illustrated in the following chart.

Figure 2.6 DSD Replenishment – Tour Mapping



Source: Interviews

2.3 The Selection between DSD and Traditional

The selection between DSD and traditional replenishment can be made based on product, retailer and supplier types. Different types of products have different characteristics which can impact the replenishment strategy selection. For example, some products are much more fragile or perishable than others, and some other products may require special handling capabilities. Different retailers or suppliers also have different preferences in choosing between DSD and traditional, because of different sizes,

capabilities, etc. This section discusses the selection between DSD and Traditional replenishment for different products, retailers and suppliers.

2.3.1 What Products are Suitable for DSD?

In order to analyze what products are suitable for DSD, relevant product attributes are reviewed. Generally, those products that are more difficult or less economic to handle due to some physical characteristics or it more sense to be distributed in a consolidated way are good candidates to use DSD replenishment.

1. Replenishment Frequency

Products with high replenishment frequency are suitable to be replenished through DSD because it is economically feasible for the supplier to make the frequent delivery through consolidated volume. Generally, products with short product life cycle, short shelf life or high inventory turnover will require high replenishment frequency. An extreme case is daily newspapers which require daily replenishment with restricted delivery windows. Some other examples include fresh vegetables, fresh baked bread, dairy fresh fast food like sushi, sandwich or salad. With the consolidation of shipment, DSD suppliers can deliver the products more frequently and economically than retailers.

2. Handling Difficulties or Regulation

Products that are regulated or require special storage and handling are suitable to be replenished through DSD. It is costly or legally impossible for each retailer to obtain the rights to transport and handle such products. For example, beer and other alcohol

beverages require special franchised distribution according to regulations. Some other products in this category may have greater likelihood of damage like CO2 or other special products. Some products like frozen pizza and ice cream need special storage facilities and handling equipments, which make them good candidates to be replenished through DSD as well.

3. Requirement of intensive merchandising

Products that require intensive merchandising are suitable to be replenished through DSD. This is because DSD can provide frequent and professional merchandising to maximize the sales performance, as one of the key values brought by DSD. Some products like cards and magazines, for instance, require intensive merchandising to attract customers.

4. Requirement of intensive care in handling

Products that require intensive care in handling would be suitable to be replenished through DSD. DSD suppliers have the better incentives and expertise to handle the fragile products, as the products upon delivery has to be verified by the retailers. Some examples include cookies and crackers.

5. Demand fluctuation

Products with high fluctuation in demand would be suitable to be replenished through DSD. In order to ensure the supply of products with high fluctuation, the supply chain needs to keep extra safety capacity of storage and transportation. To keep such

extra capacity is very costly, especially for individual medium or small retailers. For such products, it is economical for the supplier to centrally keep the extra capacity and serve the retailers through DSD. One example highlighted during interviews with PLAZA was frozen pizza and snacks which usually experienced much stronger demand in the period of Super Bowl game. Suppliers often had the challenge in keeping enough extra storage space to accommodate this very high demand, and they will prefer the supplier to use DSD to replenish the products.

2.3.2 What Retailers are Suitable for DSD?

To determine what retailers are suitable for DSD, a rule of thumb is whether the retailers can reach the critical mass of cargo flow and economy of scale by themselves. By employing DSD model, the supplier can consolidate the cargo flows of small and medium retailers and leverage the economy of scale. The benefits will then be shared between the supplier and retailers. The retailers will be able to save the cost of building and maintaining distribution centers and fleets. They can also save part of the transportation cost by sharing the benefits from using full truck load transportation with other retailers.

On the contrary, some major retail chains may be able to reach the critical mass of cargo flow by themselves. Some leading retailers like Wal-Mart have invested heavily in distribution network and build extensive expertise in related fields, and they are trying to

shift from DSD network to their own distribution network in some trial product categories or geographic areas.

Besides the concern of economy of scale, retailers may want to use DSD for high value products or bulky products. From retailer perspective, by doing so, they could avoid high inventory carrying cost and lower the risk, and use the fleet capacity more economically.

2.3.3 What Suppliers are Suitable for DSD?

To build and maintain a large scale distribution network is very costly, especially an end-to-end DSD network. In order to justify the cost, suppliers need to obtain enough cargo flow to reach the economy of scale. Some suppliers like PLAZA and Frito-lay have been running DSD network for many years and regard DSD service as a distinctive value proposition. Some other suppliers like Kimberly-Clark have just initiated DSD services in some trial areas, and they tend to control the scope carefully to manage the risk.

In summary, DSD replenishment is suitable for products that are more difficult to handle. The difficulty may come from frequent replenishment requirement, special handling and storage need, intensive merchandising requirement, regulation or high demand fluctuation. DSD replenishment is also suitable for retailers with limited logistics capacity and network, and suppliers with extensive logistics network and capacity.

3 Pros and Cons of DSD and Traditional Replenishment Models

Based on the analysis of selection between DSD and Traditional replenishment for different types of products, retailers and suppliers, this chapter synthesizes the pros and cons of DSD and Traditional replenishment models.

3.1 Pros of DSD Replenishment

1. Enable better in-store merchandising

Frequent and effective merchandising is critical to promote sales performance in retail industry. Effective DSD replenishment could help to realize an optimal merchandising from several ways.

First, DSD merchandisers are normally hired by certain suppliers and dedicated to the products of those suppliers. Those dedicated merchandisers tend to have better knowledge and deeper insight of on certain products. For example, shelf life of different products often varies in a large range. One of the key tasks of merchandising is to manage the shelf life of products and make sure all products on the shelf are not too old to sell. The merchandiser needs to put the older products in the more approachable places to expedite the consumption, and remove those out-of-date products from shelf. For those products that are about to expire, the merchandiser will often need to arrange promotion

campaign to minimize the loss. All those activities require the merchandiser to have the necessary knowledge and insights on the products and market.

Second, DSD merchandisers, compared to retail store merchandising staffs, have better incentives to promote sales performance of certain products that they are taking care of. This is because the compensation of DSD merchandisers is tightly linked to retail sales performance of specific products, but retail store merchandising staffs are often evaluated by overall sales performance of the store and many other non-sales metrics.

2. Provide special handling and storage capability and meet regulation compliance

Product characteristic is a very important factor in deciding if the product is suitable to use DSD. For instance, beer and wine are regulated to be distributed by franchised distributors. Some products that require special handling facilitates and vehicles like gasoline, CO2 and frozen foods are suitable to be replenished by specialized DSD vendors. Some special products like newspaper which have strict delivery time window will also be suitable to be replenished by DSD. 7-Eleven Stores use DSD services from suppliers for some specific products like beer and frozen food or ice mainly because DSD suppliers could provide special handling and storage services or there is regulation compliance requirement. [Osborn, 2007]

Because DSD suppliers are often able to reach the critical mass by consolidating cargo flow from retailer customers, it is usually preferable for DSD suppliers to build and

maintain the capability to handle and store products that are regulated or require special handling.

3. Make feasible frequent delivery of small order quantity

DSD suppliers normally use milk-run to replenish retail stores in the same region, and such consolidation of shipment makes economically feasible frequent delivery of small order quantity. Some major retail chains can make frequent delivery by owning and operating their own distribution networks because they have a large product portfolio and substantial cargo flow. However, for small and medium retailers or retailers with small order quantity, this advantage brought by DSD is especially valuable. Moreover, some specific products with extremely short shelf life such as newspaper and fresh food require at least daily delivery, and such requirement could hardly be fulfilled with traditional replenishment.

4. Provides flexible distribution capacity

DSD provides flexible distribution capacity (storage, transportation and handling etc), which is especially valuable in peak sales seasons. It makes more sense for DSD suppliers to keep those extra flexible capacities in a consolidated way, rather than each retailer keeps its own extra capacity. It is especially true for the products that require special storage and handling capabilities, like frozen pizza and ice cream.

5. Saves significantly the backroom spaces in retail stores

DSD enables more frequent delivery of smaller quantity of products, and reduces the cycle inventory level at each store. It significantly saves the backroom spaces and the saved backroom spaces could be converted into shelf spaces to increase sales, or got rid of to reduce cost.

6. Improves the ability to quickly restock the store for new product changes and major shelf set changes

DSD could help to expedite the replenishment and increase the turnover. It is especially valuable when the retailers or suppliers decide to restock the store for new product changes and major shelf set changes.

3.2 Cons of DSD Replenishment

1. Provide free-rider opportunity for smaller players

DSD suppliers need to invest heavily in building and maintaining extensive distribution and merchandising capabilities to support the DSD operations. Some major retailers are complaining that they in fact have to bear the majority of such costs. This is because DSD charge fee, either as part of wholesale price or special DSD fee is often universal to all retailers, and major retailers usually order much more than smaller retailers. And because the distribution network is so costly that without the major retailers who bear the majority of the cost, smaller retailers could hardly afford to operate the network by themselves and thus lose the important competitive advantage. SYSCO

decided to quit the distribution network managed by some third party logistics company and start building its own distribution network partly because they did not want to keep subsidizing other small shippers who used the same network. [Theiss, 2007]

2. Difficult to manage receiving time windows

In traditional replenishment practice, because it is the retailer that manages the distribution and replenishment for each store, the retailers can consolidate the shipment to reduce the numbers of delivery and have easier control over receiving time windows. However, in DSD practice, it is the supplier that manages the store level distribution and replenishment. When the retailer is using DSD for various products replenishment from different suppliers, the retailer often has to face the challenge of managing different receiving time windows, for different products.

This causes troubles to both retailers and suppliers. On one hand, such multiple and sometimes random receiving time windows make retailers difficult to schedule work shifts and manage resources, and retailers would have to spend more capacity in the receiving process; on the other hand, suppliers are also complaining that many times when their trucks arrive at the backdoors of retail stores, the drivers have to wait for long time until the store staffs show up to confirm the receipt. [Jamison, 2007]

3.3 Pros of Traditional Replenishment

1. Enable consolidation for bigger retailers

Traditional replenishment allows major retailers to build their own distribution centers and fleets, and thus benefit from consolidating shipment and resources.

Well-planned shipment consolidation can lead to significant cost reduction. For major retailers like 7-Eleven Stores, the potential savings from consolidation could be of strategic importance. By implementing the CDC (Central Distribution Center) consolidation strategy, annual reduction of 6,200,000 deliveries (12,300,000 total annual deliveries) to the group of 7-Eleven stores or 1,100 deliveries per store per year was achieved. [Osborn, 2007]

2. Mitigate the free-rider problem

As earlier mentioned, DSD makes it possible for smaller retailers to take advantage of free-rider opportunities. And by employing traditional replenishment, because retailers need to build their own capabilities to manage the replenishment processes, such free-rider cases will be reduced largely.

3.4 Cons of Traditional Replenishment

Disadvantages of traditional replenishment strategy are similar to the advantages of DSD replenishment strategy:

1. Potentially, traditional replenishment strategy may cause poorer in-store merchandising. However, such issues could possibly be solved by better store staff training and incentives alignment.

2. Retailers would have to build and maintain their own handling and storage capabilities, which is very costly.

3. For retailers of smaller order quantity, it would be economically infeasible to keep frequent replenishment. And the less frequent replenishment would potentially cause sales loss. Small and medium retailers are expected to face such dilemma.

In summary, DSD could bring a list of advantages, including providing better in-store merchandising, providing special handling and storage capability, making feasible frequent delivery of small order quantity, providing flexible distribution capacity, saving significantly the backroom spaces in retail stores and improving the ability to quickly restock the store for new product changes and major shelf set changes. However, DSD also has some disadvantages, including providing free-rider opportunity for smaller players and causing more difficulty to manage receiving time windows. On the other hand, traditional replenishment can mitigate the free-rider problem and enable major retailers to consolidate cargo flows by themselves. However, traditional replenishment may be costly to smaller retailers and cause poorer in-store merchandising.

4 Case Study: PLAZA and Hava's in New England

The sponsor of this thesis project, PLAZA Food Company is concerned with the possibility of major customers shifting from DSD model to traditional replenishment model. The PLAZA Food Company is a multibillion-dollar private company with 22,000 employees worldwide. PLAZA is a leader in the frozen food business, owning a list of leading brands in North America markets. PLAZA sells and delivers frozen food products using its own home delivery trucks or through grocery store freezers. PLAZA serves over 30,000 stores through its DSD network, being supported by its fleet of over 800 trucks and over 150 depots and warehouses across the 48 contiguous states.

4.1 DSD Practice of PLAZA in New England

Over the past couple of decades, with the aggressive investment in distribution capabilities, the core competency of PLAZA has evolved from sales and marketing to distribution and logistics. However, over recent years, some key customers of PLAZA have gained power and expressed interest in changing to traditional replenishment instead of the current DSD approach. PLAZA is concerned that more core customers may shift away from DSD replenishment.

Current DSD operations in PLAZA consist of five major activities: delivery, forecasting, merchandising, ordering, and store relationship management. Based on the interviews with PLAZA executives and staffs, each activity is described in turn.

1. Delivery

PLAZA operates different versions of DSD depending on the region. In the Midwest, one person acts as both truck driver and merchandiser. In New England, on the other hand, these two roles are generally assumed by two persons. Inventory to serve customers in New England is centrally stocked in a regional distribution center (RDC). The scope of this thesis is the New England area which is served by a single RDC. In addition to the “two-person” and “one-person” models, sometimes PLAZA will ask a third party to do the merchandising work. By handling delivery through DSD, the truck driver will be able to control the shrinkage in loading and unloading to the minimum. Such shrinkage in traditional network is reported to be much greater than DSD model.

In New England, PLAZA replenishes retail stores once per week, while merchandisers visit stores three to four times per week. Merchandisers tend to handle around 30 stores. It usually takes 30 minutes for one merchandiser to visit a store and 15-20 minutes for a truck driver to stop in one store for delivery.

2. Forecasting

Merchandisers gather market intelligence and competitive information through their regular store visits each week. Based on current in-store inventory level, market

intelligence collected through store visit and previous experience, merchandisers will generate a weekly forecast plan, with a two week forecasting horizon. Merchandisers will then submit this first-hand forecasting data to RDC headquarters. The RDC manager will review forecast reports from each merchandiser, determine on hand inventory at the RDC, and produce the overall RDC replenishment forecast. The RDC keeps 1-2 days of safety stock and there are 2-3 days of inventory in transit from the manufacturing plant.

3. Merchandising

Merchandisers handle the operations from the retail backroom (temporary stocking room in stores) to the shelves. Merchandisers make sure: (1) all products on the shelves are current, and place older products before newer ones to expedite the consumption the older ones, (2) the shelf display is attractive (3) any current advertisements or marketing campaigns are properly set up, and (4) there is minimal shrinkage from backroom to shelves.

4. Ordering

On behalf of each store, on a weekly base, the merchandiser will order products from the RDC. The merchandiser visits stores two days before orders are released. For most stores, as long as the ordered products are delivered to the stores, those orders will be counted as sales revenue. However, in some other chain stores which apply scan-based transaction system, those orders will not be counted as sales of PLAZA until they are actually scanned by cashier and paid by end customers.

5. Store relationship management

Merchandisers play the key role in managing the relationship with stores. They are the main contacts with the store managers. Typically, merchandisers have been working with the company (PLAZA) for over ten years, and have established and maintained good relationships with the stores. With the good relationships with stores, PLAZA is in good position in negotiating for better contracts, shelf space and position.

4.2 Trade-off Analysis of DSD and Traditional Replenishment

PLAZA has a regional distribution center (RDC) in Boston, Massachusetts to centrally store inventory and replenish retail stores in New England area. Route trucks will do the “milk-run” from RDC to replenish stores in the regions. The manufacturing plant that replenishes RDC is located in Nebraska, as shown in the Figure 4.1. Inbound transportation from the plant to the RDC is handled by full truck load.

Figure 4.1 PLAZA’s DSD network in New England area



As one of the top two customers of PLAZA in New England, Hava's has 160 stores selling PLAZA's products in the area, as shown in the Figure 4.2. Hava's has extensive logistics network. The excess capacity of storage and trucking it has in New England area is greater than the cycle volume of PLAZA's product sold by Hava's in the area. The sales of PLAZA's products in Hava's stores accounts for over 29% of PLAZA's total sales in New England area. The Hava's store with highest sales of PLAZA's products sold 6570 cases in 2006, and the lowest one sold 88 cases. The average sales of PLAZA's products in Hava's stores was 1197 cases in 2006.

Table 4.1 Sales data of PLAZA's Products in Hava's Stores in 2006

Case	
Max	6570
Min	88
Avg	1197
Med	1080
Std Dev	772

All 160 stores could be divided into seven clusters, as shown in the Figure 4.2. All stores are directly replenished by RDC. In the "one-to-many" system, to compute the estimated distance for each tour to replenish the stores, the formulas can be used:

$$d_{TOUR} \approx 2d_{LineHaul} + d_{Local}$$

$d_{LineHaul}$ = Distance from origin to center of gravity (centroid) of delivery district

d_{Local} = Local delivery between customers in the district

In the formula, a milk-run tour is simplified as the back and forth tours between the origin and centroid plus the local tour to serve each store in the region. The distance of the entire tour (d_{TOUR}) consists of two parts: the distance of line hauls between the origin and centroid ($2d_{LineHaul}$) and the distance of local milk-run delivery (d_{Local}).

Expected TSP distance to cover n stops in district of area X:

$$1.15\sqrt{nX} \geq \text{Estimated}[d_{local}] \approx k\sqrt{nX}$$

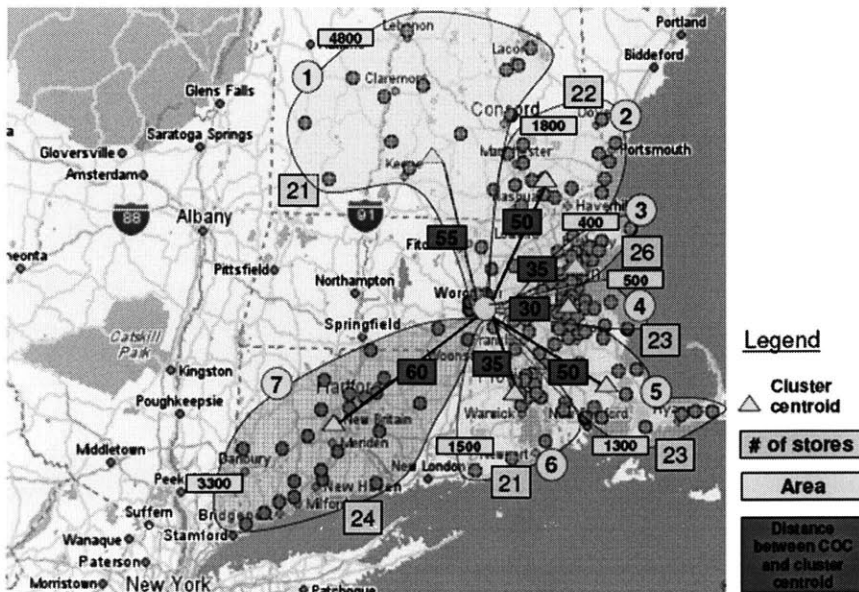
In the formula, the factor k can vary depending on the number of stops in the region (n) and whether the delivery route has to follow certain grid. For n>25 and when delivery route can be freely made, k=0.7124; while for the region with grid, k= 0.7650 [Larson & Odoni, 1981]. In this analysis, k is set as 0.7124. However, this is expected to be a conservative estimation as the actual k would potentially be higher than 0.7124 and lower than 0.7650. Accordingly, the estimations of total distance and DSD cost are also conservative.

The Figure 4.2 shows: the area of each cluster (X), the number of stores in each cluster (n) and the distance between RDC and cluster centroid ($d_{LineHaul}$).

Figure 4.2 DSD From PLAZA's RDC to Hava's Stores

DSD FROM PLAZA'S RDC TO HAVA'S STORES

Estimation



And based on a list of assumptions as below, the DSD cost for PLAZA to serve Hava's stores in New England area could be calculated.

1. All Hava's stores in New England area are directly served by the RDC
2. All Hava's stores in New England are replenished three times per week per store by average
3. RDC or Hava's distribution center for frozen products in Concord, New Hampshire are replenished once a week from PLAZA plant
4. The sales volume of PLAZA's products in each Hava's store keeps consistent in each week
5. Current excess storage capacity in Concord, New Hampshire is greater than the cycle volume of PLAZA's products sold by Hava's
6. Current excess route trucking capacity of Hava's is greater than cycle volume of PLAZA's products sold by Hava's
7. Space usage in the distribution center of PLAZA and Hava's is calculated based on cycle stock level
8. One fully loaded route truck can hold 10 pallets, and each pallet can hold 48 cases. Therefore, for route truck, a fully loaded one can hold 480 cases. And for line haul truck, which is bigger, a fully loaded one can hold 640 cases
9. Common pallet size is 48 inches by 40 inches
10. Operating cost per sq foot is 50 USD per year, excluding cost of land but including electricity, maintenance, personnel, etc
11. 1700 miles from PLAZA plant to Boston, Massachusetts
12. 1800 miles from PLAZA plant to Concord, New Hampshire

- 13. \$2.25 cost per line haul mile
- 14. \$1.37 cost per route truck mile
- 15. One merchandiser of PLAZA by average covers 27 stores
- 16. If Hava's takes over the merchandising work, there will be 0.5 hour per day per store extra merchandising needs for Hava's
- 17. \$12 per hour for Hava's staff

As shown in the Table 4.2, five cost items are involved in DSD cost for PLAZA to serve Hava's stores: handling, storage at the RDC, line haul transportation, milk-run transportation, and merchandising costs. Based on the assumptions, each cost was computed as below. Two scenarios are considered in the calculation: 3 high pallets per stack and 4 high pallets per stack of products stored in RDC. This determines the number of pallets that per sq foot can hold. PLAZA is practicing 4 high pallets per stack in RDC.

Table 4.2 Annual DSD Cost of Hava's

DSD cost_Hava's	Handling	
	Hours	1497
	Per Hour	\$12
	Cost	\$17,958
	Storage in RDC	
	Cycle Stock	1842
	Pallet	38
	Sq Foot (3 high)	171
	Sq Foot (4 high)	128
	Operating cost	
	3 high pallets stack	\$8,527
	4 high pallets stack	\$6,395
	Line haul transportation	
	Trips	299
	Per Trip	\$3,825
	Cost	\$1,144,852
	Milk-run transportation	
	Cost	\$179,969
	Merchandising	
	Personnel	6
Salary	\$47,160	
Total salary	\$282,960	
Total DSD cost	3 high pallets stack	\$1,634,267
	4 high pallets stack	\$1,632,135

If Hava decides to shift from DSD to traditional replenishment, PLAZA will need to ship products to Hava's frozen product warehouse in Concord, New Hampshire. Hava will then replenish all of its stores in the region from Concord warehouse using route trucks, as shown in the Figure 4.3.

Figure 4.3 Potential Traditional Replenishment of Hava's



As a major retail chain in the region, Hava had established extensive logistics capabilities over years. The firm currently has excess delivery fleet capacity. This is greater than the cycle volume of frozen products from PLAZA. In other words, there is little extra route (milk run) transportation cost for Hava's by adding the volume of PLAZA's product.

Based on the same assumptions used in computing DSD cost as above, the cost of traditional warehouse model can be computed as below. Two scenarios are considered in the calculation: 3 high pallets per stack and 4 high pallets per stack of products stored in supplier DC.

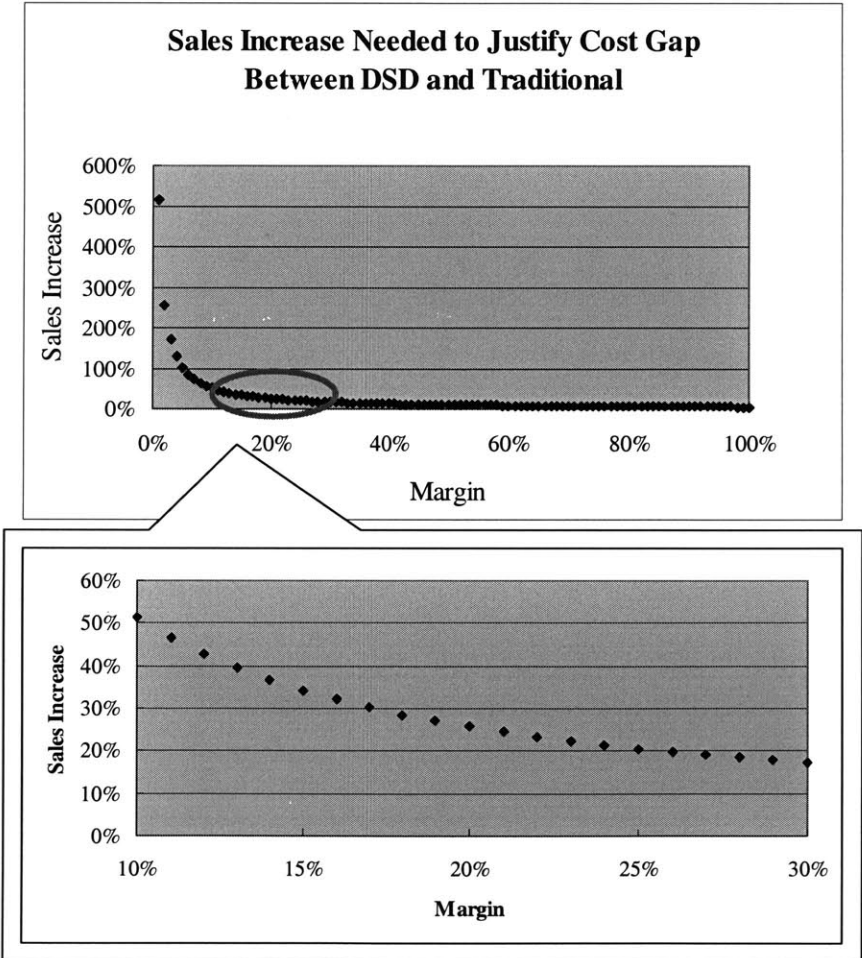
Table 4.3 Annual Traditional Cost of Hava's

Traditional cost_Hava's	Handling	
	Hours	1497
	Per Hour	\$12
	Cost	\$17,958
	Storage in Concord, New Hampshire	
	Cycle Stock	1842
	Pallet	38
	Sq Foot (3 high)	171
	Sq Foot (4 high)	128
	Operating cost	
	3 high pallets stack	\$8,527
	4 high pallets stack	\$6,395
	Line haul transportation	
	Trips	299
	Per Trip	\$4,050
	Cost	\$1,212,197
Merchandising		
Hours	1783	
Cost	\$21,394	
Total extra cost		
3 high pallets stack	\$1,260,077	
4 high pallets stack	\$1,257,945	

There are only four cost items in the traditional warehouse model cost for Hava's to replenish its own stores in the region, because Hava's will not be spending in route transportation. The costs of handling and storage of traditional warehouse model are the same as those of DSD model. Besides line haul transportation, the merchandising costs of two models are different too. In DSD model, the merchandising work will be done by full time employees of PLAZA while in the traditional model it will be done by hourly paid part-timer.

Therefore, in this specific case study, the total supply chain cost of traditional warehouse model is \$374,191 lower than that of DSD model, about 5% of net sales of PLAZA products in Hava’s stores in New England. The cost difference mainly comes from the differences of route transportation and merchandising. However, DSD services could promote sales performance by providing more professional merchandising services, better special handling capabilities, etc. The sales increase needed to justify the cost gap between DSD and Traditional models is shown in the Figure 4.4.

Figure 4.4 Sales Increase Needed to Justify the Cost Gap



According to the Figure 4.4, if the margin of the product is below 15%, the increase on sales needed to justify the higher cost of DSD replenishment is over 34%. If the margin of the product is between 15% and 25%, the increase on sales needed is between 34% and 21%. If the margin of the product is over 25%, the increase on sales needed is below 21%. It shows that DSD is more suitable for the products with high margin, as the higher supply chain cost of DSD can be more easily justified.

Based on the case study of PLAZA and Hava's in New England area, there are a couple of key takeaways: 1. There are cost and service difference between DSD and Traditional replenishment models for the supply chain of suppliers and retailers. 2. In this specific case, that the retailer has extensive logistics network and significant excess capacity, the direct supply chain cost of Traditional is lower than that of DSD model. 3. Unique benefits of DSD (such as better merchandising, special handling capability, etc) are critical to overall profitability of supply chain

5 Conclusions

This thesis analyzes the trade-offs of two retail replenishment strategies, DSD (Direct Store Delivery) model and Traditional model. Conceptual and cost models are set up to analyze the trade-offs from both qualitative and quantitative perspective, and numerous interviews were conducted to obtain insights from academic scholars and industry practitioners. A few conclusions are reached as below, and recommendations on future research are given too.

DSD replenishment is suitable for products that are more difficult to handle. The difficulty may come from frequent replenishment requirement, special handling and storage need, intensive merchandising requirement, regulation or high demand fluctuation. To determine what retailers and suppliers are suitable for DSD, a rule of thumb is whether the retailers can reach the critical mass of cargo flow and economy of scale. DSD replenishment is suitable for retailers with limited logistics capacity and network, and suppliers with extensive logistics network and capacity.

DSD could bring a list of advantages, including providing better in-store merchandising, providing special handling and storage capability, making feasible frequent delivery of small order quantity, providing flexible distribution capacity, saving significantly the backroom spaces in retail stores and improving the ability to quickly restock the store for new product changes and major shelf set changes. However, DSD also has some disadvantages, including providing free-rider opportunity for smaller

players and causing more difficulty to manage receiving time windows. On the other hand, traditional replenishment can mitigate the free-rider problem and enable major retailers to consolidate cargo flows by themselves. However, traditional replenishment may be costly to smaller retailers and cause poorer in-store merchandising.

Based on the case study of PLAZA and Hava's in New England area, there are a couple of key takeaways: 1. There are cost and service difference between DSD and Traditional replenishment models for the supply chain of suppliers and retailers. 2. In this specific case, that the retailer has extensive logistics network and significant excess capacity, the direct supply chain cost of Traditional is lower than that of DSD model. 3. Unique benefits of DSD (such as better merchandising, special handling capability, etc) are critical to the overall profitability of the supply chain.

There are a couple of areas that future researches could focus on: 1. Quantify the value of unique benefits of DSD, especially the value add of better merchandising. The study should compare the difference of sales and supply chain performance for the similar products. Ideally, the study can analyze the impact of the shift between DSD and traditional replenishment, such as in the case of PowerAde. 2. Conduct case study to analyze trade-offs for smaller retailers that without extensive logistics network and excess capacity.

Appendix

Questionnaire to retailers and suppliers

For internal record

Retailer name
Headquarter location
Brief profile
Interviewee (name, title and contact)
Date

Questionnaire to retailers

Is xxx (name of company) currently using DSD (Direct Store Delivery) to replenish your retail stores?

If yes,

1. When was DSD first implemented in your company?
2. How is DSD implemented in your company? Do you segment by products, by regions or by any other criteria? Or is it mandated by the supplier?
3. What were the reasons for implementing DSD?
4. Is xxx satisfied with current DSD operations? Yes or No, Why?
5. Is xxx thinking about shifting from DSD to traditional network, in other words, to take over the distribution from suppliers?
6. Has xxx conducted any studies in analyzing the trade offs between DSD and traditional network? If yes, what are the findings?
7. What are the pros and cons that xxx see in DSD?
8. What are the pros and cons that xxx see traditional replenishment (suppliers just ship the products to retailer warehouses and let retailer to replenish the stores)?

If not,

1. Has xxx ever used DSD in the past?

If yes, for what products or regions of store that DSD was used?

Why did xxx terminate DSD?

How are those goods being delivered now?

Is the new distribution system performing better than the previous DSD system?

Are they delivering what xxx expects from the change? In service level? In costs?

If not, has xxx ever considered or been approached by suppliers about DSD replenishment? Why did xxx decided not to adopt it?

2. What are the pros and cons that xxx see in DSD?
3. What are the pros and cons that xxx see traditional replenishment (suppliers just ship the products to retailer warehouses and let retailer to replenish the stores)?

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