An Assessment of the Value of Retail Ready Packaging

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by
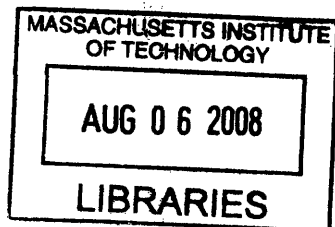
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Abstract

Use of retail-ready packaging reduces the costs of replenishing store shelves by eliminating the labor of removing packaging materials and stocking individual items on shelves. While reducing costs for retailers, retail-ready packaging formats increase costs for consumer products manufacturers.

This research project assesses the use of retail-ready packaging across varying retailer types and products to determine conditions where the value of retail-ready packaging is maximized. Taking into account the supply chain benefits and costs for the retailer, six U.S. retail channels were selected for study: supermarket, wholesale club, limited assortment, super warehouse, drug and supercenter. One retailer from each of these categories was studied. The research found a wide range in opportunity for benefits and costs. The important factors influencing the net value of retail-ready packaging for retailers were product velocity, inventory carrying costs, SKU assortment relative to retail space and store replenishment procedures.

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Chapter 1 Introduction

The consumer packaged goods (CPG) retail industry is characterized by thin profit margins. Consequently most retailers in this industry, especially ones competing at marginal costs, are interested in minimizing operating costs. According to a recent industry analysis, store labor represents one of retailers highest direct operating cost categories, averaging 69% of total costs. Recruiting and retaining adequate staffing levels are a constant challenge, with employee turnover rates exceeding 20% for many retailers (Gottlieb, 2006). Given the high costs and staffing challenges, retailers are interested in finding solutions that will reduce the need for store labor. Some retailers believe use of retail-ready packaging (RRP) offers a solution to reduce the labor required to replenish the shelves. The purpose of this research is to understand the conditions where use of RRP provides a net benefit for U.S. retailers. This chapter introduces common terminology associated with RRP and describes the basic steps of retail replenishment common to all retailers. The chapter closes with an explanation of the research motivation and the thesis scope and roadmap.

1.1 Types of Retail-Ready Packaging

Retail-Ready Packaging is classified by its structure as either a secondary or tertiary packaging unit. Secondary RRPs are called shelf-ready packages, which are case level packages designed for on shelf display. There are several types of shelf-ready

packaging; the most common five are designated as tray and hood, tray and wrap, perforated, store-made, and recyclable.

The most common tertiary RRPs are merchandise units and display ready packages. Merchandise units are commonly used in warehouse club stores, where product is displayed in full pallets, in place of shelves. Retailers typically use display ready packages in center or end aisle displays for promotional activities.

The following illustrations show the wide range of RRP types mentioned, using photos taken during various store visits:

Secondary RRPs – Shelf-Ready Packaging

1. Tray and Hood
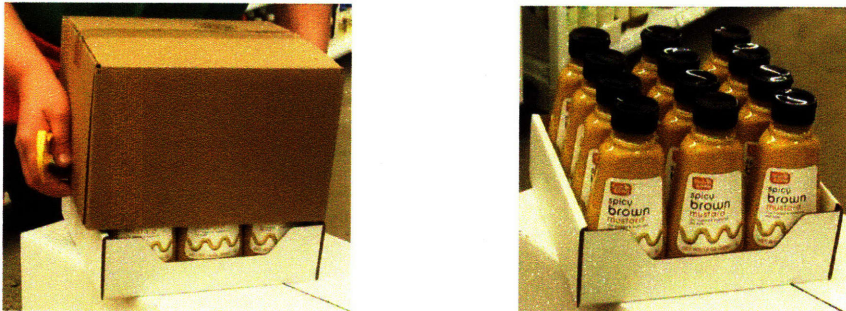
Figure 1: Tray and Hood shelf-ready packages

2. Tray and Wrap

Figure 2: Tray and Wrap shelf-ready packages

3. Perforated

Figure 3: Perforated shelf-ready packages

4. Store made shelf-ready packages

Figure 4: Store made shelf-ready packages

Many retailers make their own shelf-ready packages starting with standard corrugated cases, and use a box cutter to cut away the top and front face of the corrugated.

5. Re-usable trays

Figure 5: Re-usable tray shelf-ready packages

Tertiary RRPs

1. Merchandise unit

Figure 6: Merchandise unit RRPs

2. Display Ready Packaging

Figure 7: Display Ready Packaging RRPs

1.2   Retail Replenishment Process

The research conducted focused on product handling within a retail store. Generally,

all U.S. CPG retailers share the basic steps to replenish goods at the store

level. The physical flow of goods during retail replenishment is illustrated in the following figure:
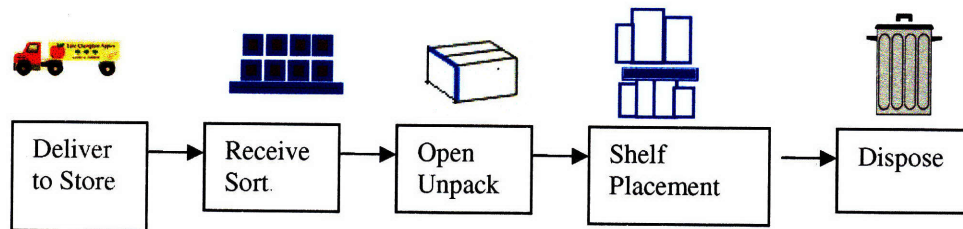
Figure 8: Standard replenishment process map

Each step is described as follows:

1.) Deliver to Store - Goods arrive at the retailer's store on a truck from a distribution center - either operated by the retailer, a 3rd party distributor or directly by the CPG manufacturer.

2.) Receive, Sort – Upon arrival product is removed from the truck and sorted for placement in the store aisles.

3.) Open, Unpack - Product is prepped for placement on store shelves or floor. Tertiary and secondary packaging may be removed at this time.

4.) Shelf Placement - Product is placed on the store shelf or aisle floor. At this step rotation of existing items on shelf may occur, in order to ensure product is placed in the order of arrival. This is commonly referred to as practicing First-In-First-Out (FIFO).

5.) Disposal - Waste generated from packaging material and plastic wrap is discarded in the final step of replenishment.

1.3   Research Motivation

Use of RRP to improve replenishment efficiency has gained momentum over the past few years across retailers in the UK and Europe. Some retailers in the U.S. have also adopted RRP as a way to reduce labor costs. The move to RRP has been largely mandated by retailers seeking to improve their costs while CPG manufacturers often incur an incremental cost burden to provide the RRP. This incremental manufacturing cost varies depending on factors such as the degree of difference between the RRP and the standard packaging, and the manufacturing platform and the type of product. For example, a store made RRP would not cause the CPG manufacturer to incur any additional costs; no change occurs in the secondary packaging. However, many of the other types of RRPs require the manufacturer to package the products manually or purchase new equipment to automate the packaging. In either situation the costs can be considerable.

Meanwhile the benefits for the retailer are not clear. Quantifiable results from retailers using RRP have not been documented despite the high interest and growing consideration of RRP.

Consequently, the overall net effects from RRP on the whole supply chain are unknown. Both the costs for manufacturers and the ambiguity of benefits for retailers represent strategic obstacles to widespread support of RRP. In addition, the third aspect RRP affects is the shopper's experience at the store. RRP directly influences how products are displayed. Some RRP proponents believe it can also improve on-shelf availability, by reducing the labor needed to re-stock the shelf.

The aim of the research project is expand the understanding of the benefit offered by RRP for a U.S. retailer. Also an objective of the work is to identify conditions where strategic or operational barriers prevent or limit the use of RRP for a retailer.

1.4   Scope of Project

The research examines the operational processes of six retailers, which represent a range of U.S. retail formats found in the U.S. Through use of interviews and observations, the benefits, issues and tradeoffs involved with the use of RRP are identified. Factors considered include store business strategy, inventory and ordering policies, store replenishment processes, staffing and labor arrangements, product sales velocity and RRP implementation scope.

Although the net effect of RRP implementation is felt by manufacturers, retailers and consumers, the scope of research for this project is limited to the application of RRP at the retail level. An objective is to identify the specific types of stores and product attributes where RRP can provide the greatest benefits to provide priorities where retailers and manufacturers may focus implementation efforts.

The scope has been limited to consider only ambient consumer packaged goods including health and beauty care and grocery items in order to get an initial read given time constraints. Also not studied in this project is replenishment for promotional orders.

1.5   Thesis Roadmap

This section outlines the chapter by chapter roadmap for the thesis. Chapter 2

discusses the previously published literature on the subject of RRP, including a

history and evolution of its use and the benefits and issues associated with RRP.

Chapter 3 describes the methodology applied to obtain and analyze the research data.

Chapter 4 provides a map of the retail supply chain replenishment process and

reviews the field observations in the form of retailer case studies. Finally, Chapter 5

provides a concluding summary of the work, recommendations and areas for future

research.

Chapter 2 Literature Review

2.1 Overview

Driven by a desire to reduce costs and improve product availability, the consumer

packaged goods industry has published a wide body of research on the topic of

improving replenishment efficiency. In the research of the literature that was

conducted for this project, hundreds of articles were uncovered in business and trade

magazines mentioning retail-ready packaging (RRP) or related terminology.

There was first trade press reference to RRP as a strategy to improve retail

replenishment as early as 1986, but literature does not mention its retail use prior to

1999. In 1999, Wal-Mart pioneered the conversion to standardized Reusable Plastic

Containers (RPCs) across all of its fresh produce manufacturers. Other retailers

followed Wal-Mart's lead (Major, 2007.)

More recently, RRP has been studied for use in product categories outside of

produce and fresh foods. In 2004, a grocery industry consortium Efficient Consumer

Response Europe, adopted RRP as a core strategy to improve retailer efficiencies.

The Efficient Consumer Response (ECR) initiative began in the U.S. in 1993

as a joint effort between manufacturers and retailers seeking to reduce retail supply

chain costs and better serve the needs of the consumer. ECR lost support in the U.S.

in the late 1990's when program results did not meet expectations of supply chain

inventory and cost reductions. Mohtadi and Kinsey (2005) attribute reasons for the

diminished U.S. results of ECR to lack of information sharing between supply chain partners.

The ECR initiative in Europe, Australia and parts of Asia and Africa, continues to have widespread industry participation (Super Marketing, 1998). When RRP became part of ECR UK's focus, research was commissioned to publish a "Blue Book on the subject [of RRP] between manufacturers and retail partners."(ECR UK, 2005). Since 2005 the following studies have been published.

- *ECR UK's Retail Ready Packaging Blue Book* thoroughly introduces RRP and its intended purpose.

- In 2006, in a paper jointly published with Accenture, ECR Europe published *Addressing the Challenge: a comprehensive guide for a collaborative approach*

- Building on the original 'blue book' ECR UK published the *International Retail Ready Packaging Report* in 2007

- Also in 2006 ECR Australasia published *A focus on shelf ready packaging: An industry toolkit.*

- In 2007 ECR Europe published another joint report with Accenture *Piloting the business case assessment methodology for the hair and body wash category.*

These ECR publications represent the only substantial studies published about RRP. Furthermore, no publications were found that provide measurable results from retailers who have converted to RRP. Instead, several references were identified

expressing concerns over lack of rigorous cost savings information and various other issues such as the effect of RRP on waste.

The rest of this chapter will discuss the relevant information learned from the literature. First a background and evolution of RRP use is provided; then the benefits and issues associated with RRP are described.

2.2   Background of RRP

ECR UK (2005) describes secondary packaging as originally serving three intended purposes. The main objective was to provide product protection during transit from the point of manufacturer through the retailer distribution system to the store shelf. The second objective was to design packages that would maximize pallet and truckload utilization.   The third was to minimize the time required to pick the product in the warehouses by optimizing the case size.

Wal-Mart was the first retailer to initiate a widespread adoption of RRP in 1999, using standardized Reusable Plastic Containers (RPC) as a way to improve distribution and store labor efficiency.   The standard dimensions for the RPC's served three purposes – efficient pallet construction, reduced damage and labor costs resulting from reduction in handling. (Pulp & Paper, 2003)

The move toward RRP as a stocking strategy for other consumer packaged products began with discount retailers interested in improving replenishment efficiency. According to the Institute of Grocery Distribution (IGD) (2007), early adopters of RRP in the UK were discount stores Aldi and Lidl. Their primary objective was reduction of store labor costs. Although manufacturers supplied

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product in standard cardboard secondary case units, the discounters created their own RRPs by cutting out front pieces of cardboard at the top and front and placing the modified case on the shelf. Presumably, the consumer expectation of shelf appearance and shopping experience was not as important a consideration for a discount chain.

Beginning in the UK, the initiative to apply RRP across a larger scale has been underway since 2003. IGD research indicates the UK leads the world in RRP use.
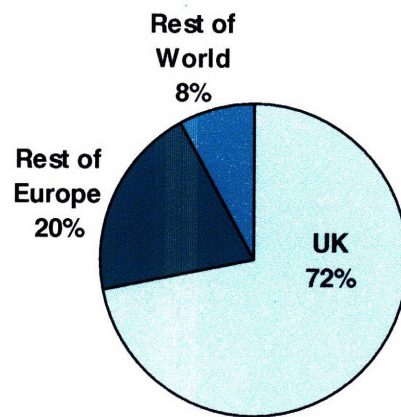
Figure 8: Use of RRP by Geography (Source IGD 2007 p. 4)

Reasons cited for the move towards RRP were labor shortages coupled with the realization RRP could provide increased efficiencies for the retailer. IGD (2007) asserts prior to 2003 "the last 50 metres of replenishment", meaning at the retail store, had been overlooked due to other improvement initiatives taking precedence.

As of August 2007, Tesco is listed as the leading retailer in RRP use, with an implementation rate across 58% of its SKUs, with plans to increase its use in the future. IGD lists 13 total retailers from the UK and 1 from Australia currently using RRP:

Tesco	Biedronka
Aldi	Metro
Asda	Morrisons
Auchan	Netto
Carrefour	Rewe
Coles	Sainsbury's
Lidl	Woolworths (Australia)

Table 1: Key Retailers Using RRP (Source IGD 2007 p. 4)

2.3   Evolution of RRP Focus

IGD describes over the last 3 years the focus areas concerning RRP have evolved

beyond the initial goal of reducing replenishment labor to include other areas of the

supply chain. In the first year of implementation, the focus for RRP centered

primarily on saving replenishment time. The RRPs addressed the need to improve

replenishment speed, but created costs and issues in other areas. During the second

year the focus expanded upstream to address transit and pick and downstream to

consider disposal issues and the effect on the shopper. In the past year more attention

is being placed on the manufacturer's cost as part of an overall supply chain

assessment. The following table illustrates the focus areas since the RRP roll-out and

indicates future direction.

Generation	RRP FOCUS AREAS								
	Upstream			Retail store				Downstream	
	Pack	Transit	Pick	Identify	Open	Replenish	Dispose	Shop	Waste reduction
2003-2004				←		→			
2005-2006		←					→		
2007- present		←					→		

Table 2: Scope of RRP by Generation (Source IGD 2007 p. 6)

IGD predicts the next phase of RRP development will place increasing emphasis on environmental concerns.

The objective to reduce packaging materials may change the way RRPs are designed in the future. Loudin (2005) describes environmental advantages by using Reusable Plastic Containers in place of display ready corrugated. A 2004 Franklin Associates comparison study of their use in produce found "RPC's require 39% less energy, produce 95% less solid waste, and generate 29% less greenhouse gas emissions than display ready corrugated."

In 2007 Wal-Mart announced plans to issue a sustainability scorecard for its manufacturers. Material optimization is also a primary concern and is listed as carrying 15% of the scorecard weighting. Smorch (2007) suggests CPG manufacturers identify innovative ways to re-design packaging to use less material.

Through its ECR UK initiative, IGD (2007) currently has an active packaging subgroup focused on RRP and its effect on the environment. The group, which consists of two retailers and ten consumer packaging manufacturers, plans to publish

a "blue book regarding RRP and the environment" which "highlights best practices" and "provides a legislative summary relevant to RRP."

2.4   Benefits and Issues

Some retailers believe the use of RRP in place of traditional secondary packaging offers a solution to reduce store labor required to replenish the shelves. With traditional packaging, secondary cases arrive at the store on pallets. Replenishment is a labor intensive process that generally goes as follows: Cases are sorted and transferred from the backroom to the store aisle and each primary selling unit is removed from the case and placed on the shelf. The secondary case is then discarded.

The studies published on RRP in the years following its launch do not provide any estimates of the retailer labor savings opportunity associated with RRP. The published business justification came in a more implicit form and extended beyond direct labor savings to include benefits such as enhanced product availability and shopper experience.

According to IGD there are five ways using RRP can provide an improvement over replenishment using a traditional secondary package. IGD has coined these in industry as the "Five Easy's", as in Easier to...Identify, Open, Replenish, Dispose and Shop with respect to traditional packaging (2007):

IDENTIFY	Clear recognition of brand and product for store staff
OPEN	Reduced time and need for a cutting tool
REPLENISH	Single 'one touch' movement of case quantity onto shelf, rather than stacking individual items
DISPOSE	Simple to dismantle packaging and separate and recycle materials
SHOP	Quick identification of category/brand and unimpeded access to shop

Table 3: RRP 5 Easy's (Source: IGD, 2007 p.2)

The first four "Easy's" have the potential to directly affect store replenishment activities. Combined, these four represent the retailer's opportunity to save time and subsequent labor during replenishment. The fifth improvement, Easy to Shop, encompasses the effects of the shelving presentation on the consumer shopping experience.

2.4.1   Benefits

Next the 5 Easy's will be explained in greater detail, using examples from the literature that demonstrate how RRP offers an improvement over traditional packages.

Easy to Identify

Identification of the product at the retail store may occur several times as it is handled through the shelf replenishment process. An Easy to Identify packaging solution enables faster identification of the brand and the specific product.

Easy to Identify examples illustrated in ECR's report (2006) include trays with clear plastic overwraps, packaging with the product name clearly displayed on the box and cardboard cutouts revealing the consumer unit. The following photo illustrates an ECR example of Easy to Identify:

Figure 9: Easy to Identify (Source: Accenture and ECR, 2006 p. 16)

Easy to Open

Re-usable crates represent the best example of easy to open. Also, RRPs that don't require cutting tools to open help reduce the time to open, improve safety, and prevent accidental product damage from cutting too deep.

An RRP requires more care when opening than a standard case because it is placed on the shelf and viewed by the consumer. The RRP should appear in excellent condition and not contain any leftover remnants from the tear away portions.

Examples of Easy to Open RRPs are shown in the following:

Figure 10: Easy to Open (Source: Accenture and ECR, 2006 p. 17)

Easy to Replenish

The core function of RRP is to reduce the time to place the product onto the store shelf. RRP enables a full case of product containing individual consumer units to be placed on the shelf in one swift movement as compared with the practice of placing individual items onto the shelf, one at a time.

ECR (2006) describes best in class under the category easy-to-replenish as RRPs with highly stable and ergonomically designed packaging that minimize the amount of shelf space required. According to ECR optimal shelf space refers to having an item case count that supports at least 2 RRPs on shelf.

The following photo shows an example of Easy to Replenish:

Figure 11: Easy to Replenish (Source: ECR UK 2005 p.23)

Easy to Dispose

ECR (2006) describes best solutions as ones that are simplest, recyclable, and breakdown into flat pieces. Compared with a standard case, the amount of waste material generated from a RRP is virtually the same, but disposal occurs in two steps for RRPs, compared with one step for standard cases. A standard cardboard case is discarded (recycled) when the individual units are removed and placed onto the shelf. For an RRP, during the first step, when the product is placed onto the shelf, there may be plastic wrap or cardboard pieces to throw away, but the bulk of the secondary packaging remains on the shelf. Once the consumer units are sold and the RRP is empty, another disposal step occurs to clear the shelf of the empty tray.

Easy to Shop

The fifth easy refers to the experience of the consumer at the first moment of truth, a term coined by Procter and Gamble Company, which describes the moment when the consumer stands in front of the store shelf and makes a decision to purchase a

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product. Harrison (2006) explains the quality of the product on shelf is as important as having the right product available on the shelf.

ECR (2006) reinforces this message by cautioning that any RRP labor and time benefits are negated if the product is difficult to locate or if the product diminishes in appearance or stability as a consequence of the RRP. As with the criteria for the other "4 Easy's," when evaluating whether an RRP is Easy to Shop a decision should be made on the basis of relative comparison between the RRP and traditional stocking methods.

Many RRPs may not be considered *Easier* to Shop compared to traditional shelving, because the RRP adds cardboard to the shelf and covers a portion of the product. Some solutions are clearly better than others, but the determination is ultimately subjective, and dependent on the store presentation and layout.

In certain applications, it is believed that the brand presence on the shelf can actually be enhanced by RRP. RRP can provide additional printed advertising space for the product or help to support and display items that are not stable as individual units. The RRP can aid in product recognition and appearance quality. This is especially true in categories like confectionary, as illustrated in the following example:

Figure 12: Easy to Shop (Source: IGD 2007 p. 9)

2.4.2 Assessing RRP on a Case-by-Case Basis

The 5 Easy's describe the potential advantages and disadvantages of RRP for the retailer and consumer. The benefit of improved product availability is not represented in the 5 Easy's, but regularly listed by ECR and retailers as being a goal of RRP (In-Store, 2006, IGD 2007.) Availability can be potentially enhanced with RRP because of the ease of one touch replenishment, allowing the store workers to quickly replace an empty shelf.

ECR Europe (2006) suggests retailers and manufacturers need to carefully assess the value proposition of each potential RRP implementation, first by product category and then by individual product if sizes, dimensions and case quantities vary greatly within a category.

They propose the following assessment grid to assign priority to a category or individual product.

Figure 13: RRP Prioritization Grid (Source: ECR Europe 2006 p. 25)

The grid suggests when considering a transition to RRP the retailer should place the highest priority on items or product categories that have the highest sales volume and offer the greatest opportunity for shopper benefits, including on shelf availability. The tool however doesn't suggest how to measure current on shelf availability or how to determine the potential improvement by using RRP.

In the same publication ECR presented 10 case studies on specific products where RRP was implemented across different categories. For each they described how the manufacturer designed a RRP solution to improve specific aspects of the replenishment process. The results varied between each item, some generating significant labor or availability improvements and others not resulting in any benefits for the retailer.

2.4.3 Issues with RRP Implementation

Although the transition to RRP is underway in Australia Levinson (2006) makes note of the absence of rigorous cost analysis making the case for RRP. A pilot on the business case for the hair and body wash category, conducted by ECR Europe (2007), offers an explanation for the lack of quantifiable results available on RRP for retailers, listing the following reasons:

1.) On-shelf availability data for individual products is difficult to measure.

2.) Although ECR findings suggest RRP offered a 15% improvement in total time to replenish the shelves, translating time savings to labor savings poses a challenge. The labor savings opportunity varies depending on store labor arrangements and cost of labor.

Another issue referenced by Levinson is that CPG manufacturers are incurring additional costs due to design changes and are not receiving any share of the benefits. The ECR pilot on hair and body wash products assessed the business case for RRP, taking into account the manufacturers costs in addition to the retailer's benefits. The pilot was conducted across five manufacturers and two retailers and evaluated several products in the category. Across the products evaluated, the results showed costs increase for the manufacturers compared with relatively low benefit for the retailers. The following figure illustrates the range of costs and benefits for each product studied:
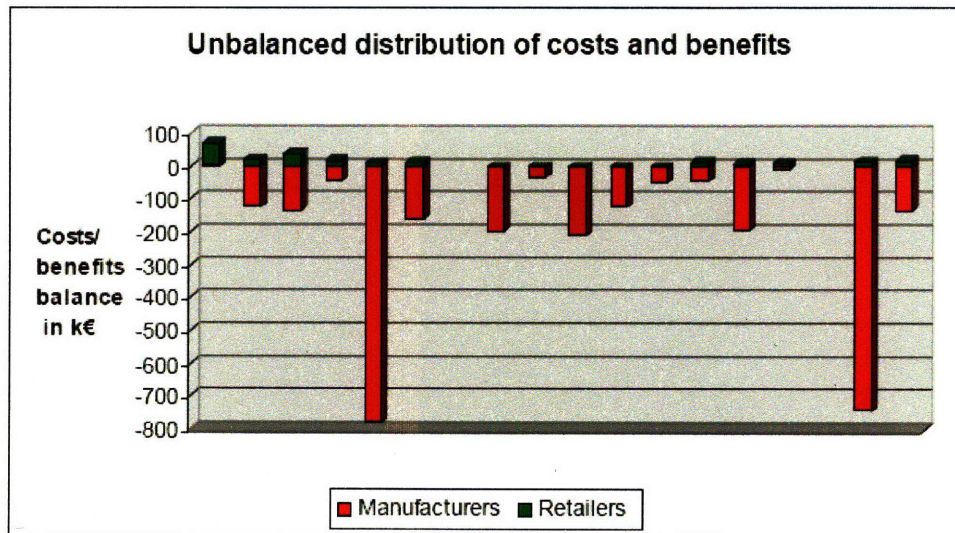
**Figure 14: Estimated RRP Cost-Benefits Hair and Body
(Source ECR Europe 2007, p. 7)**

The graph indicates the net supply chain results are not favorable for RRP for the

products considered in this study. The report points out the challenges with

quantifying the benefits for the retailer and adds the manufacturers' costs include

increases for packaging materials due to higher print and board quality as well as the

one time capital investment for packaging equipment.

The literature depicts the environment surrounding RRP is not one of

partnership between manufacturers and retailers. Instead, manufacturers are being

required to comply with retailer RRP demands, while incurring the cost burden.

Resistance from manufacturers may prevent RRP from becoming a sustainable

solution. According to Mohtadi and Kinsey (2005), we have seen with past ECR U.S.

initiatives that lack of effective collaboration between supply chain partners has

eventually caused programs to lose favor, eventually tapering off.

Another issue is the consumer perception of RRPs effect on increased waste, especially with shelf-ready packages. Even if the shelf-ready package uses no additional material, Park (2007) reports that consumers now see the secondary packaging on the shelf and may perceive excess waste.

Park adds that some RRPs actually use considerably more material than their traditional counterparts. In some situations the redesigned RRP contains fewer items per case in order to enable cases to be stocked two deep on the shelf.

An alternative to changing the pack size is to carry excess inventory on shelf, which also comes with cost tradeoffs for the retailer. Product velocity and replenishment lead time directly influences how many items ideally should be stocked on shelf. The research explores the concept of inventory on shelf as a factor for determining when SRP may or may not be a good fit for a retailer.

2.5 Summary

The literature was reviewed by presenting an overview of the history, evolution, perceived benefits and issues with RRP implementation. The following is a summary of the conclusions:

- RRP for replenishment began in the late 1990's for produce and perishables.

- Retailers in the UK and Europe moved to RRP for consumer packaged goods in 2003.

- ECR (Europe, UK, and Australia) is the only organization publishing RRP studies.

- Several issues surround RRP:

- The retailer benefits are only described implicitly in the "5 Easy's"; implementation results have not been quantified.

- Collaboration between supply chain partners is not sufficient; retailers are mandating RRP irrespective of the manufacturer's costs, yet not sharing the savings with manufacturers.

- Concern over RRP generating increased packaging waste may generate negative consumer perception. Studies are underway by ECR to determine RRPs effect on the environment.

The aim of the research is to expand the existing knowledge base on RRP by exploring the conditions where RRP can provide a net benefit for a U.S. consumer products retailer. Benefits and barriers of implementing RRP will be assessed using the business justification found in the literature as a basis for the analysis.

Questions that have not been fully addressed in the literature are listed below. These questions were used to guide the research process.

- Does RRP make more sense for certain types of retailers? Why or why not?

  - What is the role of sales velocity and product assortment on the potential benefits of RRP?

  - How does the inventory and ordering policy influence the decision to implement RRP?

- Which products are best positioned to benefit from use of RRP? Which products are a poor fit for RRP?

- What are the key differences in replenishment processes for retailers using RRP and ones who are not?

- Questions for retailers using RRP: What savings or advantages does RRP provide? Of the "5 Easy's" and other benefits, which aspects are providing an improvement over traditional methods? What types of RRP are being used? Do the benefits from RRP vary with different types of RRPs? Are their any disadvantages or issues that have arisen related to RRP?

- How can the net benefits and costs from RRP be measured and what challenges exist to quantifying them?

Chapter 3   Research Methodology

Interviews and retailer process mapping were used to address the questions raised in the previous chapter. In this chapter these research methods will be described in greater detail.

3.1 Retail Store Interviews

Six retailers were selected for the research study. Managerial and wage employees were interviewed to learn about their replenishment processes, operational policies and work challenges. The interviews were semi-structured with prepared questions; however the entire set of prepared questions were not always asked of each retailer. All interviews were conducted in person at the store.   The types of retailers selected are described in the next chapter.

3.2 CPG Co Interviews

Interviews were also conducted with knowledgeable individuals from the sponsor company.   Meetings were held with several customer team operations and logistics managers, a logistics director based in the UK and a retail strategy solutions leader. They helped to guide the developing of the research questions by discussing their experiences with RRP and other efficient replenishment initiatives. The customer

operations and logistics managers initiated contact with several retail stores and shared their insights on retailer corporate and operational strategies.

3.2.1 Direct Product Profitability Model

A model on average operating costs for the traditional grocery format, generated by consulting firm Willard Bishop in 2001, was used as a reference for retail industry costs. Their research involved extensive data collection with time and motion studies of retailer costs and activities. They developed a direct product profitability model using activity based costing to allocate indirect labor to product costs. The study showed that incremental costs above product costs incurred at the retail store level average to $.62 per case. These costs are divided into nine categories of labor and overhead. The following figure indicates the cost per case for each cost category.

$.62/case

PLACE ORDER	STORE OCCUPANCY	INV CARRY	RECEIVE SORT	OPEN UNPACK	SHELF PLACEMENT	DISPOSE	CHECK OUT	BAG
$.03	$.06	$.02	$.13	$.03	$.11	$.07	$.15	$.01
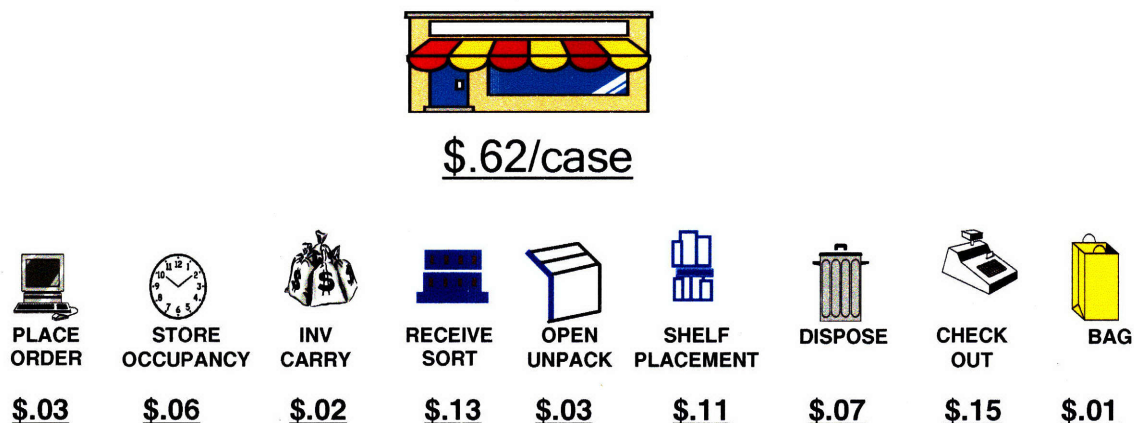
Figure 15: Grocery Retailer Product Cost Model (Source: Willard Bishop, 2001)

The activities associated with retail replenishment are captured in 4 of the cost categories listed: receiving/sorting, opening/unpacking, shelf placement and disposal.

Their cost contributions sum to $.35 per case, or 56% of a retail store's incremental operational costs above product costs. The argument favoring RRP is that it reduces the time and subsequent labor involved in completing these steps. For this project there was no objective to replicate or validate the research but it was utilized as a conceptual tool to improve the understanding of the potential savings offered with RRP. In the next section the approach used in this project to map the retailer's process is described.

3.3 Process Mapping

The interviews provided a broad understanding of the key differences amongst the retailer's strategies and operations as well as their perspective on RRP. Sufficient information was gathered to make general observations about the fit of RRP for each retailer type. Another area of focus was also how a retailer could quantify the benefits from RRP for specific products. This question was addressed by mapping the replenishment activities of two retailers in the traditional grocery format, one not using RRP and one using RRP.

Access was granted to observe the entire store operation and closely observe employees at each step of the process. The activity based costing concepts presented in the previous section were used to measure each step of the retailer's replenishment processes. This entailed physical observation and timing of activities associated with replenishment at a store. The timing of activities was intended only to guide the observations and was not considered a statistically significant time and motion study. Due to time constraints and limited samples available a rigorous cost model

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could not be developed, but based on the observations a discussion is provided on how a retailer could quantify the savings. The tradeoffs between inventory and labor costs associated with RRP are also considered.

Chapter 4   Observations and Analysis

In this chapter the observations made from the research are discussed. First, an overview of the types of retailers studied is presented, followed by the observations made in the field.   The strategic and operational differences observed in these retailers are reviewed.   An assessment is provided on how product attributes and replenishment differences affect the potential benefits from using RRP.   The chapter closes with a discussion on quantifying the benefits associated with RRP.

4.1 Overview of Selected Retailer Types

Consumer packaged goods are sold across several types of retail stores in the U.S. Consulting firm Willard Bishop (Carafini, 2007) categorizes the industry as having three main retail formats – traditional grocery, non-traditional grocery and convenience stores.   Contained within these formats are a total of 13 different segments.   The various segments are listed in the following table:

Traditional Grocery	Non-Traditional Grocery	Convenience Stores
Supermarket	Wholesale Club	Convenience with gas
Fresh Format	Supercenters	Convenience without
Limited-Assortment	Dollar Stores	
Super Warehouse	Drug	
Small Grocery	Mass	
	Military	

Table 4: Retail Store Segments, (Source: Willard Bishop 2007)

Several of these retailer segments were studied to generate a broad understanding of the benefits and issues associated with using RRP. Six leading retailers were selected, representing segments from the traditional grocery and non-traditional grocery category.

Convenience format retailers were not considered, because the potential retailer benefit of RRP is very limited at these stores. Most store items are replenished using Direct Store Delivery (DSD), which means the manufacturer or wholesaler is responsible for stocking the store shelves, not the retailer.

Retailers were selected from the following segments: drug, wholesale club, super warehouse, supercenters, limited assortment stores and supermarkets. The segments chosen were evenly divided between the traditional grocery and non-traditional grocery format; highlighted in the following table:

Traditional Grocery	Non-Traditional Grocery
Supermarket	Wholesale Club
Fresh Format	Supercenters
Limited-Assortment	Dollar Stores
Super Warehouse	Drug
Small Grocery	Mass
	Military

Table 5: Retailer Segments Selected for RRP Assessment

Combined, these six segments represent 89% of the total revenue for grocery and consumables in the traditional and non-traditional grocery formats (Caffarini, 2007).

Each segment attracts customers using different business strategies. These strategic differences often result in differences in store presentation and replenishment practices. The segments vary by store size, SKU assortment and average weekly store sales. The following table illustrates these differences by segment for sales of U.S. grocery and consumable products.

Segment Examples	# of stores	Sq ft / store	# of SKUs	Sales / store (weekly)
Supermarket – Albertson's, Kroger, Royal Ahold, Safeway	27,267	52,100	45,500	$266,899
Limited Assort.- Aldi, Trader Joes	2,789	15,000	1,400	$115,785
Super Whse - Cub Foods, Shopper Food & Pharmacy	507	60,700	41,000	$538,741
Supercenter - Meijer, Super Kmart, Super Target, Wal-Mart	2,696	184,100	125,000	$889,479
Wholesale Club - BJ's, Costco, Sam's Club	1,240	131,000	5,100	$985,183
Drug- CVS, Duane Reade, Walgreens	19,864	11,700	20,000	$40,894

Table 6: Description of Segments Source: (Willard Bishop 2007, p.3)

In the next two sections reasons why these factors significantly affect the potential benefits achieved from RRP are discussed.

4.2 Effects of Sales Velocity on RRP Benefits

Using the information from Table 6 average weekly store revenue per SKU was

calculated for each segment, which is summarized in ascending order in the following

table:

Store	Weekly Sales/ SKU
Drug	$2
Supermarket	$6
Supercenter	$7
Super Warehouse	$13
Limited Assortment	$83
Wholesale Club	$193

Table 7: Wkly Sales/SKU

With this table a direct correlation can be inferred between weekly revenue per SKU

to average SKU velocity. Weekly sales per SKU are calculated by multiplying Price

times Quantity sold. One can assume the average price for grocery and consumables

is relatively similar, even across varying retailer types. The remaining variable is

quantity sold per week, or item velocity.

The benefits obtained from RRP increase directly with item velocity. The

following example can aid in understanding the reasoning behind this conclusion:

Suppose a store sells and re-orders one case per week of a particular SKU and 2

minutes per case are saved when replenishing using RRP compared with individually

stocking the items. With the specified velocity, cases of this SKU will be replenished

52 times a year; total annual savings equals 2 X 52 or 104 minutes.   If the sales

velocity increases the time savings increases linearly; the magnitude of time saved increases each additional time the case is replenished.

4.3 Effects of Assortment and Store Size on RRP Benefits

Using the data in Table 6 the ratio of average square footage per SKU for each retailer type was calculated. This SQFT/SKU ratio is listed in ascending order by retailer segment in the following table.

Store	SQFT/ SKU
Drug	0.6
Supermarket	1.1
Supercenter	1.5
Super Warehouse	1.5
Limited Assortment	10.7
Wholesale Club	25.7

Table 8: SQFT/SKU

The SQFT / SKU ratio can be used to provide a relative sense of the space allocated per item sold at each type of retail store. This can be used as quick assessment of whether RRP is a good fit, because RRP requires a retailer to allocate enough shelf space to a SKU in order to replenish in full case quantities. As mentioned in Chapter 2, ECR recommends a 2 case minimum shelf presentation for RRP. Though the amount of square footage required for 2 cases will vary from product to product, an illustration can be made on how much shelf space is required using an example of an average sized item - a 14 oz bottle of shampoo containing 12 items per case. This item is calculated to have 0.7 ft^2 per case. At a minimum shelf presentation of 2 cases, this SKU would require 1.4 ft^2 of shelf space for use of RRP.

Though the case size and retailer space allocation per SKU will vary greatly by retailer and items, some general conclusions about shelf space and its effect on RRP use can be made. As a quick assessment, the space requirements for RRP use could be limiting for drug and grocery retailers currently allocating less space then 1.4 ft^2 per SKU on average.

This can also be determined at a category/product level without needing to calculate item square footage. Intuitively, if a retailer currently stocks less than two full case quantities on shelf for a particular item, then a switch to RRP will require a change to the store's inventory policy and shelf layout. Both are factors that carry important implications for a retailer's revenue and inventory costs.

These tradeoffs are discussed further in the following section as the observations made during the retailer visits are described.

4.4 Retailer Observations

The names of the retailers studied are kept confidential; they are referred to according to their respective category – Drug Co, Club Co, Super Warehouse (Ware) Co, Super Co, Grocery Co and Limited Assortment (LA) Co. This section describes the notable observations made from the retailer research. An overall RRP assessment is provided for each retailer. An assessment of the benefits against the 5 Easy criteria is also provided for retailers currently using RRP.

4.4.1 Drug Co

Drug Co is one of the largest providers of prescriptions and related healthcare services with over 6000 stores in the U.S. Front store sales make up approximately 30% of Drug Co's revenue, consisting of general merchandise, health and beauty care, household and grocery items.

4.4.1.1 Drug Co Store Observations

- There are no known examples of RRP use at Drug Co today.

- The majority of SKUs sold at Drug Co are positioned with only one facing* on the store shelf. *The term facing refers to the number of units that are visible at the front of the shelf. Additional units are stocked behind the first unit.

- Average expected weekly front store sales velocity is one item sold per SKU.

- Stores place orders and receive deliveries once every week. Typical order quantities occur at the level of 1-3 items per SKU. The majority of items arrive in storage tote containers.

- Backroom space is limited and not intended for inventory storage. Exceptions are pre-build for upcoming promotions and leftover inventory from past promotions. It is used as a staging area when a delivery arrives and is set-up as an extension of the store aisles, to facilitate sorting and shelf placement.

4.4.1.2 Drug Co RRP Assessment

Based on the observations RRP does not fit with Drug Co's store operating strategy. The two major barriers to implementation are few facings per item and low item sales velocity.

Items having less than two facings are not readily available in RRP formats. The option of manufacturer's providing smaller case quantities that are only one facing, for example a 1 X 6 sleeve instead of the typical 2 X 6 or 3 X 4 item case configuration, is not an optimal solution because it increases packaging materials used, increasing manufacturer's costs as well as the environmental impact from increased waste.

In order to implement RRP Drug Co would have to change their shelf layout by increasing the number of facings and total inventory held on shelf per SKU. They already have allocated all of their shelf space to maintaining a high assortment per square foot. They would have to reduce their SKU assortment to free up front shelf space to utilize RRP, which is not consistent with their business strategy.

In addition, their low sales velocity reduces the optimal amount of inventory that should be held per item. Drug Co's reported weekly average velocity of one item sold per SKU is consistent with the segment information reported in table 7, linking sales per SKU to velocity. If Drug Co were to consider a switch to RRP for efficient replenishment, the expected benefit from a reduction in stocking time would be minimized because the order frequency is so low.

The negative effects far outweigh the benefits. A switch to stocking two cases on the shelf for RRP compared with a few items at present would result in bloating

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Drug Co's stock to 24 weeks of average inventory held on shelf. Though they would reduce delivery and stocking costs, their inventory holding costs would be anywhere from four to eight times greater. Also, they physically do not have the extra space to carry the excess inventory.

4.4.2   Club Co

Club Co operates over 300 warehouses in the U.S., which offer branded and private label products in a range of grocery and consumable categories. Products are typically sold in bulk quantities to businesses and families. Shoppers are required to obtain a club membership for an annual fee. The wholesale club channel boasts the highest SKU sales velocity while SKU assortment and prices are lower compared to other retail segments.

4.4.2.1   Club Co Store Observations

-   No shelf infrastructure – In place of shelves, Club Co displays product on full pallet merchandise units, which are a type of tertiary RRP. RRP is used throughout the store, for all dry grocery and consumable goods. Combined with the tertiary Merchandise Units, items are often contained in secondary Shelf Ready Packages. For example, the following photo shows a tertiary RRP Merchandise Unit of Peanut Butter. The pallet is six layers high with fifteen cases per layer. Each case is a Shelf Ready Package containing 3 primary items per case.

Figure 16: Club Co RRP

- Club Co receives specially designed RRPs from their CPG manufacturers.

- Shipments are unloaded by store staff and pallets are taken directly to store aisles using forklifts. Replenishment efficiency is maximized.

- Merchandise units are often stacked two pallets high with metal racks holding the second pallet above the first.

- Club Co does not provide shoppers with bags at checkout; shoppers are encouraged to use leftover secondary packaging to carry their goods. Empty secondary cases are collected by store staff and gathered near the checkout area for shoppers to box their goods in.

- Product appearance does not appear to be a major concern for Club Co. Some pallets were dented and empty cardboard boxes and plastic wrap were piled around many pallets.

4.4.2.2   Club Co RRP Assessment

RRP is a positive fit for Club Co. They are currently using RRP throughout their stores which help them maximize their replenishment labor efficiency. Key to their

successful use of RRP is their characteristically high product velocity and large amount of store space. The reduced SKU assortment is a key factor in high individual item velocity per store.

Summary of RRP benefit for Club Co using the 5 Easy Criteria:

EASY to:		Does Use of RRP Provide An Improvement Over Traditional Shelf Displays? Why or Why Not?
IDENTIFY	YES	Merchandise Unit enables easy ID of product / brand and type
OPEN	YES	Virtually nothing to open, just remove plastic wrap
REPLENISH	YES	Efficiency maximized, no shelf to stock
DISPOSE	YES	Leftover packaging is used by consumers.
SHOP	NO	Aisle appears cluttered, product is not displayed neatly, empty cardboard and plastic wrap buildup.

Table 9: Club Co 5 Easy Assessment for RRP

4.4.3   Super Warehouse (Ware) Co

Ware Co is a discount warehouse chain operating a network of stores in the West Coast. Compared to a traditional supermarket, typical warehouse grocery chains offer about 10% less assortment and only a 17% higher square footage. The extra space per SKU allows them to sell goods in bulk and operate more similarly to a wholesale club store. The store visited for this study was 54% larger, or 80,000 square feet in size, and offered a similar variety of SKU's as a traditional supermarket.

4.4.3.1   Ware Co Store Observations

- RRP is utilized throughout the store. Most items are displayed on store shelves in Shelf Ready Packages. Full pallets are placed directly on the floor for items on sale.

- There are enough front facings allocated to each item to accommodate at least one full case. Based on the case configuration, shelved items usually have 2-4 facings.

- All store items have at least a 2 case minimum shelf presentation and many have 4 or more cases on shelf, stacked two high and deep.

- Nearly all RRPs are 'store made' shelf ready packages. Employees use cutting tools to remove the cardboard front and top from a traditional brown case. Observations are that opening a case requires more skill than a standard package because of the care required to neatly cut away the cardboard, without damaging the product or leaving unsightly cardboard edges. Store made Shelf Ready Packages are illustrated in the following photos:

Figure 17: Ware Co Store Made Shelf Ready Packages

- Though care is taken to neatly cut the Shelf Ready Packages the store shelves still appeared cluttered with cardboard.

- Store space is well utilized, with stored pallets of product stacked two high above the shelves.

- Store order quantities typically are multiple cases at a time and up to full pallets per SKU.

- Aisles are wide enough to use a stand-up rider forklift to bring product out to the floor for replenishment, as shown in the following photo:

Figure 18: Forklift Used for Replenishing the Shelves

Replenishment Steps

- A delivery truck containing pallets is unloaded and employees bring pallets out to the store aisle using a stand up operator forklift.

- The forklift operator removes the plastic wrap and makes Shelf Ready Packages out of the cases using a cutting tool.

- Cases are placed on the shelf.

-   Once the shelf is full, any excess product remaining on the pallet is re-wrapped with plastic and is stored on racks above the shelves as shown in the following photo:

Figure 19: Pallets stored above shelves

-   Empty packages are discarded.

4.4.3.2 Ware Co RRP Assessment

The use of RRP fits with Ware Co's strategy. The benefits being achieved from their use of RRP are solely in replenishment time. They would stand to benefit even more from a Shelf Ready Package that is easy to open, because currently it takes extra time to carefully cut open the cases with a cutting tool.

They can be compared with Club Co except that they use shelf ready packages instead of full pallet merchandising units. The major difference between these stores influencing the inventory held is item velocity. Table 7 indicated that although the super warehouse segment has double the item velocity as a traditional supermarket,

the wholesale club channel has item velocities that are fifteen times higher than the super warehouse segment. Correspondingly, Club Co carries a similar magnitude of greater inventory than Ware Co.

Ware Co has organized their shelf layout around the use of RRP, meaning they design their shelf layout with enough front facings to accommodate a full case of each SKU at a minimum. Many items take up six facings, which amount to two full cases positioned in front. The store orders individual items in partial pallet (greater than one case) quantities, taking advantage of their floor space with the ability to store pallets above the aisles.

Another potential benefit from storing pallets above the aisles is a reduction in shelf stock-outs. If a customer encounters an empty shelf they may be able to look up and see the product they want sitting on the rack above the shelf. They can notify a store employee to retrieve the product. Alternatively if the product is sitting in the backroom out of sight, a customer might not bother asking someone to look for it.

Ware Co's replenishment process enables them to take advantage of scale economies by replenishing several cases at once of the same item. Use of a forklift allows them to quickly arrive at the aisle location and they can unload a pallet quickly, and stock multiple cases at once. Alternatively, if an item is replenished only a few at a time, such as in the Drug Co example, the replenishment time per item is greatly increased.

Item velocity for this retail segment doubles traditional grocers, which enables stores to order in higher quantities and dedicate more square footage per SKU, two important considerations for RRP.

Summary of RRP benefit for Ware Co using the 5 Easy Criteria:

EASY to:		Does Use of RRP Provide An Improvement Over Traditional Shelf Displays? Why or Why Not?
IDENTIFY	YES	No difference to find the location of the first case, but multiple cases at once of the same item saves
OPEN	NO	Cases are opened carefully using a cutting tool, and extra time is taken to ensure they are ready for display
REPLENISH	YES	One step versus one at a time
DISPOSE	-	No Difference
SHOP	NO	Aisle appears cluttered, product is not displayed neatly, empty cardboard buildup occurs

Table 10: Ware Co 5 Easy Assessment for RRP

4.4.4 Super Co

Like other retailers in this category, Super Co offers a large variety of branded and private label grocery and general merchandise items at discount prices. One important point is although the weekly revenue per store is three times higher than a supermarket the item velocity Super Co and a traditional supermarket is nearly the same. This discrepancy is due to the high variety of SKUs offered. The SKU assortment offered at Super Co is three times higher than a traditional supermarket and nine times higher than a Limited Assortment Store.

4.4.4.1 Super Co Store Observations

- Super Co uses RRP, typically whenever items have three or more front facings and enough space for 2 cases deep.

- Their criteria for carrying enough inventory to support RRP are high velocity low price, small size items.

- They utilize all forms of Shelf Ready Packages, including hood and tray, perforated cases but most often use store made.

- Shelf appearance is mixed throughout the store; some items have clutter and cardboard and others have a neat appearance.

- Due to the high assortment, many items have 1 front facing.

- They use Shelf Ready Packages on items with 1 facing that do not stand up by themselves. In these situations the manufacturer supplies an inner pack sleeve inside a secondary case which aids in holding the product on shelf as shown in the following photo:

Figure 20: Shelf Ready Packaging Sleeves

- The aisle bottom rows often contain full pallets of large bulky items.

4.4.4.2   Super Co RRP Assessment

Super Co's uses RRP for improved replenishment efficiency when conditions are favorable. This translates to they will use RRP on items having shelf presentations exceeding 2 cases deep and more than 2 facings. Shelf presentations are determined by item velocity, item size and item cost.

They are not interested in adjusting shelf layout and inventory levels to make RRP fit their replenishment process. Inventory control is critical for Super Co because they carry such a high assortment in their stores. On many SKUs they have two facings or less and also keep the shelf depth below the two cases minimum needed for RRP. This is in contrast to Ware Co, who set each item's minimum shelf presentation to fit RRP requirements. Super Co's average inventory turns are half of Ware Co's and much lower compared to wholesale club or limited assortment stores.

It was evident from the store study, Super Co is not as concerned with impact of RRP on shelf appearance. Many shelves using store made Shelf Ready Packages were cluttered.

Summary of RRP benefit for Super Co using the 5 Easy Criteria:

EASY to:	Does Use of RRP Provide An Improvement Over Traditional Shelf Displays? Why or Why Not?	
IDENTIFY	-	No Difference
OPEN	-	Cases are opened carefully using a cutting tool, and extra time is taken to ensure they are ready for display
REPLENISH	YES	One step versus one at a time
DISPOSE	-	No Difference
SHOP	NO	Aisle appears cluttered, product is not displayed neatly, empty cardboard buildup

Table 11: Super Co 5 Easy Assessment for RRP

4.4.5 Grocery Co

Grocery Co is a large supermarket chain based in New England, operating several hundred stores. Grocery Co competes against lower priced supercenters and grocery

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warehouses by offer a shopping 'experience' for their customers, providing a wide variety and the freshest, best looking products and store format.

4.4.5.1 Grocery Co Store Observations

- Store appearance, "No clutter policy" - The store manager stated very clearly that store appearance is critical for Grocery Co's strategy. A "no clutter" policy is in effect, referring to cardboard not being allowed on the shelf. Exceptions are limited to seasonal items, because items change frequently and shelves are not redesigned each season.

- RRP is not used to aid in replenishment at Grocery Co. Several items arrive from the manufacturer in Shelf Ready Packages. During replenishment they are unpacked and placed individually on the shelf due to the no cardboard policy. The only items found in Shelf Ready Package sleeves on shelf were ones that could not stand up on their own, such as spice packets.

- During promotions the only allowable RRP is end aisle Display Ready Packages, because they do not result in leftover cardboard cases. Store labor during the day is focused on serving the customer and maintaining the cash register. The manager claims staff is not available to remove cardboard from the shelves once the store opens.

- Another example of setting the shopping experience is their health and beauty care section, which offers softer lighting and wood floors to create a relaxing ambiance.

- Shelf heights are adjusted to exactly fit specific products, with little gaps, contributing to the neat and full appearance of the store shelves.

- Most products are limited to less than a full case of inventory on shelf, usually 2 front facings X 3 items deep. Grocery Co uses adjustable partitions to limit shelf depth as seen in the following photo:

Figure 21: Shelf partitions to limit inventory

- On items where demand is seasonal, Grocery Co adjusts the shelf depth to carry more inventory during periods of heavy volume. An example is refrigerated dough, during the Fall key baking season twice as much product is placed on shelf. The behavior of adjusting inventory to fit demand is one indication Grocery Co is very concerned with optimizing their carrying costs.

- Deliveries of grocery items arrive five times per week and health and beauty care items arrive twice per week. Order quantities range from a few items to full cases.

4.4.5.2 Grocery Co RRP Assessment

Grocery Co's differentiating business strategy relies on attracting customers by offering a wide variety of the highest quality, fresh looking products. Their store appearance is an essential part critical to portraying this image. The use of RRP is prohibited because of the concern it would detract from the store's image. They want shelves to appear full at all times; a half empty Shelf Ready Package would not be acceptable.

Aside from appearance, Grocery Co's focus on keeping inventory as low as possible indicates a possible cost conflict with RRP use. In most cases they would have to double the amount of inventory on shelf to utilize RRP in replenishment. An analysis of the tradeoffs between inventory costs and labor savings for Grocery Co is covered later in this chapter.

4.4.6 Limited Assortment (LA) Co

LA Co operates a network of limited assortment stores all under 20,000 square feet and offering between 3000-5000 SKUs. The stores are positioned as low cost and prices are considered competitive with supercenters.

4.4.6.1 LA Co Store Observations

- RRP use is high. All types of RRPs can be found; display-ready packages for promotions, merchandise units with permanent aisle positions and every type of shelf-ready package.

- Non perishable product facings range from 2-6. Most shelf-ready packages have 2-3 front facings. For every SKU the shelves contain 2-6 full cases or a full pallet on faster selling items.

- Re-order quantities are set to one case on most items.

- Deliveries of perishables and dry consumables are received every day.

- Shelves are designed to accommodate RRPs. Compared with other stores observed LA Co's shelves are deeper and items are spaced further apart.

- Tray and hood or wrap shelf-ready packages were the easiest to open. Perforated shelf-ready packages often require cutting tools and more effort to open.

- The store appearance is neat and clean and open. This can be attributed to the low shelf heights and the lack of variety in a small space. Also the shelf-ready packages kept loose items from falling over and the shelves looked tidy. No clutter appeared from excess cardboard on shelf.

4.4.6.2 LA Co RRP Assessment

From the observations, it seems LA Co's use of RRP improves store replenishment efficiency and improves the shopper experience by helping to keep the store looking clean. The neat appearance from RRP is a result of the high square footage allocated per SKU and uniform appearance of RRPs. Also the overall lack of variety can help contribute to the neat store appearance. In contrast, drug stores have roughly the same store floor space but 7 times the assortment, making the shelves look and feel crammed.

Summary of RRP benefit for LA Co using the 5 Easy Criteria:

EASY to:		Does Use of RRP Provide An Improvement Over Traditional Shelf Displays? Why or Why Not?
IDENTIFY	-	No Difference
OPEN	-	Results are mixed, some are easier, some are more difficult
REPLENISH	YES	One step versus one at a time
DISPOSE	-	No Difference
SHOP	YES	Store is neat and clean. Shelf Ready Packages seem to enhance the appearance on shelf in some cases.

Table 12: LA Co 5 Easy Assessment for RRP

4.5   Process Mapping For Two Retailers

Although many of the questions outlined in Chapter 2 were covered in the previous section, a few important questions remain:

- What are the key differences in replenishment processes for retailers using RRP and ones who are not?

- Are their any disadvantages or issues that have arisen related to RRP?

- How can the net benefits and costs from RRP be measured and what challenges exist to quantifying them?

These remaining questions were addressed by taking a closer look at the replenishment processes of two retailers - Grocery Co and LA Co. Each store's replenishment steps were physically mapped and observe the key differences between settings, one where RRP is used and one where it is not used.

Labor activities were documented and measured by timing each step of replenishment. The objective was to develop a framework for quantifying the net benefits of RRP. Close examination of the step by step procedures also helped identify other benefits or issues from use of RRP that were not uncovered during the store interviews.

In this section the process maps and corresponding observations are described for both retailers.

4.5.1 Grocery Co. Replenishment Process

Grocery Co's replenishment process was mapped on the weekend delivery of Health and Beauty Care (HBC) items. Grocery Co offers a wide assortment of items in this category, including over 400 SKUs of hair wash, over 200 SKUs of deodorant and 140 SKUs of toothpaste. The HBC category accounts for 25% of Grocery Co's store inventory, but only 5% of its total sales.

In this delivery of HBC items, exactly 133 small tote containers of HBC products arrived on the shipment. Item quantities ranged from 1-12. Upon removal from the delivery truck they were placed in an area of the backroom designated for HBC.

During the session three part time employees were involved in replenishing the delivery. One worked night shift and spent four hours in the backroom, sorting and tagging the items. The other two worked during day shift and were the regular HBC stockers for the weekend HBC delivery. They usually also have one to two other employees assist with HBC replenishment, but several team members were

absent that day and the store was short on staffing. The first employee continued the backroom sorting and tagging for the first 3.5 hours. When all 133 totes were ready, she assisted the other employee with stocking the items on the shelves for the next 3 hours. The second stocker spent the entire time stocking the shelves, which was completed 6.5 hours into the day shift.

The replenishment process that followed is diagramed below. It is a more detailed version of the process outlined in the first chapter. Following the diagram is an explanation of what occurred at each step.
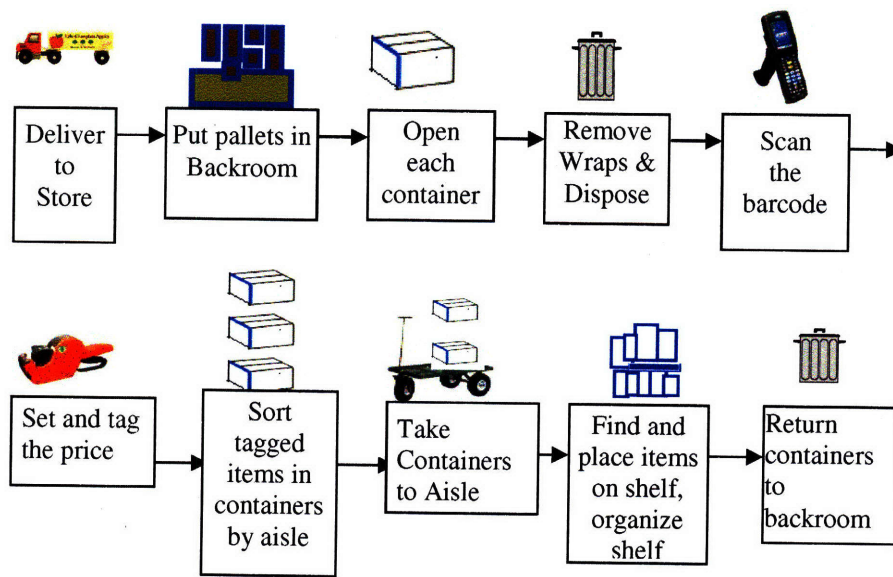

Figure 22: Grocery Co HBC replenishment diagram

1. The delivery arrives at the store

2. Pallets are placed in store backroom, HBC pallets are placed in the designated HBC area.

3. In the same area is a sorting table. Each container is sorted on this table.

4. Items are removed from the containers and any plastic wraps are removed from the items. Wraps are discarded.

5. Each item is scanned with a barcode scanner.

6. A pricing gun attached by cable to the scanner reads the barcode and sets the item price. The stocking clerk uses the price gun to place a price tag on each item. The process is repeated when a different type of product or different brand is picked up. Usually all same SKU items are together in the container and can be priced all at once. Also, price tags on items that are the same brand and price can use the current tag without requiring a new scan.

7. Once items are given a price tag they are sorted into one of three containers according to their HBC aisle location. The stocking clerk knows the aisle location by memory.

8. Sorted full containers are placed on a cart by aisle and brought out to the floor, several at a time. Sometimes the stocking clerk positioned in the backroom brought them to the aisle stocker and sometime he went to the backroom to pick up a cart. The cart is wheeled out into the middle of an HBC aisle.

9. The stocker opens one container at a time and places each item on the shelf before moving to the next container. Several items are removed at a time from the container, the shelf location is identified, and they are placed on shelf. Each product section of shelf is sorted and arranged neatly before moving on to the next set of items. This often involved picking up product that had been knocked over or moved by shoppers or the stockers themselves.

10. The process is repeated for remaining totes. All empty totes are returned to the designated area in the backroom and eventually are returned to the distribution center.

The following is a photo of the backroom operation:

Figure 23: Sorting and price tagging in the backroom

4.5.1.1 Measurement of Replenishment Activities

The total labor time to replenish was measured for the full delivery of 133 containers – beginning with the first time the product is picked up in the backroom at the sorting table (step 3) to the point where the entire shelf is replenished (step 10). The following data comes from one delivery; the data is not statistically significant and should be used to make general observations or as a basis for further research.

-   On average, total time to complete steps 3-10 was 16.5 seconds per item.

- Replenishment at Grocery Co can be divided in to two main steps – 1. Sorting and placing a price tag and 2. Taking containers to the floor, stocking items on shelf and clean-up.
  - Total time for Step 1. - 7 seconds per item
  - Total time for Step 2. – 9.5 seconds per item
- Labor time was measured for activities occurring on individual containers. It was not possible to isolate and measure activities on containers for each step because many activities happened simultaneously. Steps 3-7 represents one set of timed activities and step 9 is another.
- In the backroom six full containers were timed separately, capturing steps 3-7: Backroom sorting, disposing trash, scanning and tagging a price. Average time was 156 seconds per container or 5.8 seconds per item. Standard deviation across six containers measured was 1.1.
- At the aisle 12 full containers were timed, capturing step 9: Remove items from container, identify shelf location, place on shelf, organize shelf. Repeat. Average time was 237 seconds per container or 7.9 seconds per item.

4.5.1.2 Interesting Observations

- Item pricing law - Massachusetts state law requires all grocery store items for sale be marked with a price tag. There are a few exceptions, such as frozen products, which are exempt from unit pricing. Michigan is another state known to have a similar requirement. Placing a price tag on individual items eliminates any benefit from RRP, because each item has to be removed from a

case and tagged. It also adds a considerable amount of time to the entire replenishment process; the store manager estimated it adds a third to the total time. The manager's estimate was consistent with our observation; when steps 3-7 were measured, approximately 75% of the time recorded could be attributed to pricing activities. Steps 3-7 accounted for 42% of the total replenishment time; which indicates pricing comprises 32% of the total replenishment time.

- A considerable amount of stocking time is spent organizing the shelves once the item is placed. Items get knocked over or turned by shoppers and during the stocking process.

- It takes an experienced stocker a long time to identify where the item should be placed on the shelf.

- FIFO shelf rotation was not being practiced by either of the two stockers observed at Grocery Co. Newer items are simply placed in front of older items and no check of product date was done. However, when asked the HBC manager stated FIFO is part of the standard stocking procedure.

4.5.2   Limited Assortment (LA) Co

LA Co's process was observed over a two day period, for two truckloads on a Friday and Saturday morning. On both days the delivery arrived after the store had opened for the day. On the first day only one pallet of non-perishables arrived with the shipment and on the second day three pallets of non-perishables arrived.

Replenishment activities were observed for all products delivered because of the low number of pallets arriving on each store delivery.

All items are unloaded and placed in the backroom, in the order in which they are received. Once the shipment is fully unloaded, all available employees immediately start the replenishment process, prioritizing the perishable items first. Afterwards, the pallets of dry non-perishable goods are brought to an aisle and replenished by several employees at a time. At any given point a pallet would be unloaded by two to four employees until it was complete. Each day at least five employees helped with the replenishment process, including the store manager.

4.5.2.1 LA Co replenishment Process map

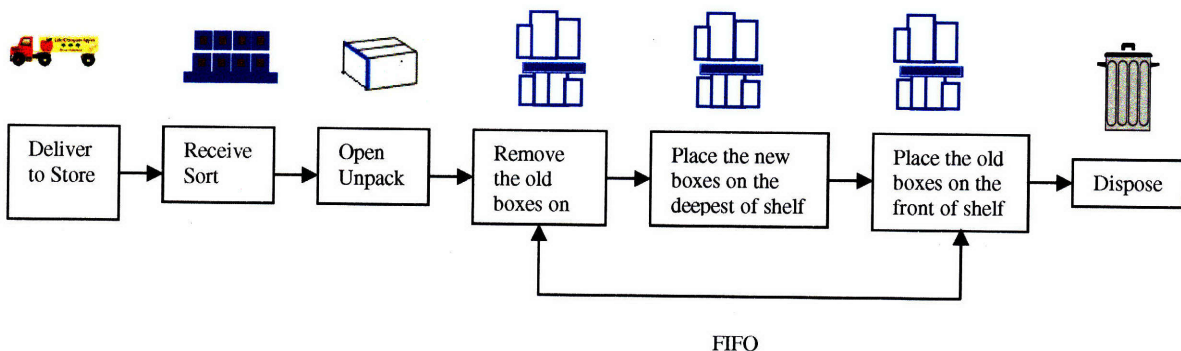The process map is based on the replenishment of dry consumables.

FIFO

Figure 24: LA Co replenishment Process map

1. Receive the pallets from the truck and place in the backroom

2. Bring a pallet onto the store aisle to replenish the shelf.

3. Open a case

4. Identify the product and where the shelf is located in the aisle

5. Practice FIFO by removing the current inventory from the shelf and checking the
expiration date.

6. Place the newer inventory to the deepest position on the shelf.

7. Place the existing cases of inventory back onto the shelf, oldest items in front.

8. Discard waste including empty cases into receptacle located next to the pallet.

4.5.2.2 Measurement of Replenishment Activities

Measuring the labor time involved in replenishing dry consumable goods proved to
be a challenge because there were so few pallets on each day's shipment. The pallet
would be staged in the middle of an aisle but would have product that was spread
across five aisles. Several staff members were involved in unloading each pallet, but
would often get interrupted to attend to customers or assist other staff members with
perishable goods.

- Step 2: bring pallet from the backroom to the aisle. Two pallets were timed.
  On average it took 36 seconds.

- Timing was combined for steps 3-8: open, identify, place on shelf with FIFO,
  and discard waste. A total of 22 cases were timed for these exact steps and on
  average it took 6.6 seconds per item, with a standard deviation of 5.

- Time to open was measured for 10 cases and averaged 31 seconds per case, but ranged from 3 seconds – 82 seconds.

4.5.2.3 Interesting Observations

- LA Co practices FIFO diligently across all items. Eight different employees were observed stocking the shelf over the two days and all used the same procedure – remove all existing items on the shelf and place the newer in back and the older in front. FIFO is generally considered a good practice; however, because there are several cases of product already on the shelf when an employee replenishes a case, it adds considerable time and ergonomic issues to the replenishment process. Excess motion was observed by moving the older product off the shelf, placing it on the floor, and then returning it to the shelf. Some of the items are also heavy and could lead to strains from repetitive lifting. Any time savings from replenishing in full cases are also diminished.

- An incremental time savings can be achieved when more than one case of the same product or type of product is stocked at the same time. For example three cases in a row of similar types of nuts were placed on the shelf. The time to complete replenishment steps 3-7 was 2 ½ times longer for the first case then for each of the other two. Activities such as identifying the shelf location were incurred during the first case and required no additional time for

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the other cases. Also opening the second and third case each took half the time as the first because learning from the first case made it faster the next time.

- Item re-order points are set to trigger a new order when one full case (usually 12 items) has been sold. Lead time on orders is one day. When the new case arrives the shelf already contains at least one to five full cases of the product, which creates the FIFO issue. Based on this re-order policy the store will always have excess inventory on the shelf, unless an entire shelf sells in one day. Instead, if they were to set the re-order to trigger when they are down to the last case then a re-order would replenish the entire shelf at one time; the FIFO issue would be eliminated. Also the number of times a year the item needs to be replenished would be reduced and as described in the previous point, time would be saved on additional cases beyond the first one. The drawback would be an emptier looking shelf, if inventory position is not optimized with item velocity.

4.6   Quantifying the Benefits and Costs

Conclusions cannot be drawn by comparing the replenishment times between the two retailers. The data gathered is too limited to use as a statistically significant comparison. Conditions were also very different between the two retailers. The products observed during replenishment at Grocery Co were different than the ones observed at LA Co. Also the state of Massachusetts item pricing law requires additional steps for Grocery Co, that if were not required would change their replenishment process.

These issues are reflective of the challenges retailers face when trying to quantify the business justification for RRP. If a retailer simulated the conditions of stocking under RRP, the full effects a change to RRP would have on their costs may not be accurately reflected. As discussed throughout the chapter, factors such as shelf layout, presentation, rotation, inventory and re-order points may all change with use of RRP, all of which would also affect the time involved in stocking the shelf.

In addition, time savings do not translate directly to labor savings. The following hypothetical time savings example will be used to illustrate this concept:

A retailer finds use of RRP across their store generates a net savings of two person hours per day in store replenishment time. Can this retailer translate the time savings into proportional labor savings?

The answer is it all depends. In the ideal scenario the retailer can achieve the savings by reducing a part time employee's hours each day. However, there are many issues with store staffing arrangements that could prevent these savings from being realized. Two potential issues are described below:

1.) If the 2 hours of savings are distributed amongst 6 stockers, each averaging a savings of 20 minutes per day using RRP, the time saved would likely be absorbed in other store activities or idle time, but may not be significant enough to change the hours worked by each person.

2.) Labor arrangements may require the retailer to offer each employee a minimum number of paid hours each day or week worked. At Grocery Co, all temporary and part time employees are guaranteed a minimum of six hours per day. Two hours of time saved may not reduce labor costs if there is already not enough

work to fill the minimum hours for each person. At the same time two hours alone is not enough to reduce an entire headcount.

These are some of the issues that could prevent time savings from resulting in labor savings. Retailers need to consider their unique staffing arrangements and determine whether actual labor savings can be realized from RRP.

Retailer costs associated with use of RRP also need to be factored in to the analysis. Several potential costs have been mentioned:

- Inventory carrying costs and increased product obsolescence if on shelf inventory increases

- Sunk costs from shelf renovations and infrastructure investments

- Increase in product purchase costs if the manufacturer charges extra for RRP formats.

The research demonstrates that these individual costs and benefits vary greatly amongst retailers and products and would need to be analyzed on a case by case basis.

Chapter 5 Analysis & Conclusion

The total relevant costs one must consider when assessing the value of RRP for a retailer are labor and inventory costs. These are influenced by the following factors: item sales velocity, labor rate, replenishment time, quantity of inventory held, item price, carrying rate and store operational procedures.

The magnitude of the labor savings from RRP is expected to increase directly with item velocity. RRP time savings are a result of the time savings per item replenished multiplied by the number of times replenished. The relationship between the average item velocity for each retailer category studied and their perceived benefits from RRP is illustrated in the following chart. The average item sales velocity per retailer segment uses the Willard Bishop data detailed previously in tables 6 and 7.
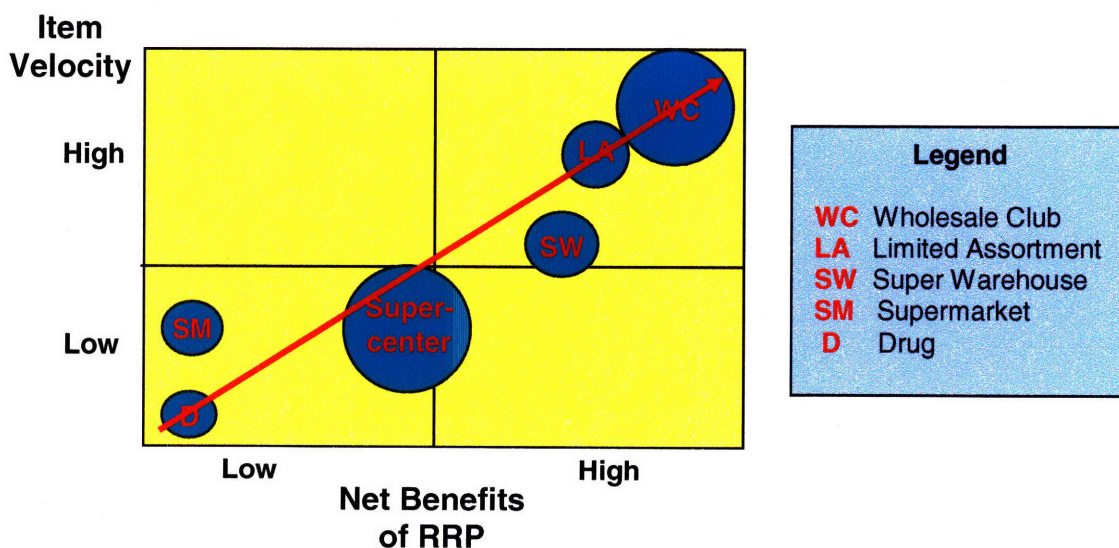

Figure 25: Effects of Item Velocity on RRP

The relationship between average item velocity and retailer perceived net benefits of RRP is linear across the store segments, with the exception being the supermarket. During the study of supermarket retailer Grocery Co it was determined their primary reason against the use of RRP was concern the additional cardboard on the shelf would detract from the store's appearance. Although Grocery Co represents the supermarket segment it cannot be assumed that all supermarkets are as concerned with store appearance to the same degree as Grocery Co. Supermarkets positioned as lower cost retailers may be more willing to consider use of RRP to reduce operating costs. Those willing to consider RRP would then need to assess where it makes sense based on inventory, product velocity and store space considerations.

A retailer's optimal inventory level depends on the total relevant costs between labor and inventory carrying costs. Item cost and amount of inventory held directly effect the inventory carrying costs. RRP imposes a constraint on inventory optimization by requiring a minimum of 2 cases to be held on the shelf. For items that are more costly the optimal inventory levels may be well below the 2 case minimum. The labor savings resulting from use of RRP may not outweigh the additional inventory holding costs.

The factors influencing the total relevant costs vary amongst products sold at a single retailer; therefore each product category should be evaluated for fit. Retailer's and products having the following attributes make the most promising candidates to achieve net benefits from the use of RRP:

- Higher velocity items increase the magnitude of labor savings achievable

- Lower cost items reduce the inventory carrying costs

- Smaller sized items reduce the amount of shelf square footage required

- Products already at or above 2 cases on shelf, with at least two facings

- Products currently ordered in full case quantities

In order to help quantify the industry benefits achieved from RRP further research could be conducted on the total relevant costs for retailers using a statistically significant data sample – many retailers and detailed time and motion studies.

While reducing labor costs for retailers, retail-ready packaging formats increase costs for consumer products manufacturers. Any addition of packaging materials used to make RRPs increase the environmental impact. Future research could examine the variance in costs and material usage across manufacturers and identify ways to minimize them. Retailers are advised to partner with manufacturers to determine total supply chain costs and implement retail-ready packaging only when it delivers a net supply chain benefit.

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