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DEPARTMENT OF SUPPLY CHAIN AND INFORMATION SYSTEMS

ANALYZING THE WAYS COMPANIES CAN INCENTIVIZE CONSUMERS TO
INITIATE THE RETURNS PROCESS WITHIN CLOSED LOOP SUPPLY CHAINS

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ABSTRACT

The use of Closed-Loop Supply Chains (CLSCs) worldwide has become increasingly popular, as sustainability is becoming a critical component of an organization's mission and strategy. While the company's responsibility for the product ends upon its delivery to the consumer in traditional supply chains, companies utilizing CLSCs are taking the additional responsibility for the product as waste. Therefore, companies must evaluate proper incentives to encourage the consumer to return the product to the company rather than conveniently disposing of it. This thesis, in full, provides background and current practices of Closed-Loop Supply Chains and analyzes the incentives needed for consumers to return used products to companies implementing a CLSC to be remanufactured, repaired, or recycled. This knowledge is contained through the analysis of literature reviews and existing CLSC practices across various industries to come up with a classification system of the criteria present in products that lend themselves capable of being returned. Based on the analysis of the existing CLSC applications and literature reviews, three standard criteria were current: consumer's need to replace the product, the feasibility of return process for the consumer, and monetary incentives in exchange for the consumers return. This thesis could provide a framework for companies looking to execute a reverse strategy within their CLSC and encourage consumers to return the product based on its criteria.

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Chapter 1

Introduction & Methodology

With sustainability becoming more of a business requirement rather than a business choice, companies are continuing to adopt a values-based approach into their strategy. Sustainability, from a business standpoint, involves how a company manages to meet their own needs of the present and without compromising the ability of future generations to meet their own needs (Brundtland et al., 1987). By incorporating these responsible initiatives into their corporate strategy, a business aims to have a positive impact on the environment and society. As there becomes a growing awareness of the importance of sustainability by both consumers and investors, companies engaging in responsible practices have become essential to their long-term success.

The primary focus of this thesis will be a canvassing of existing literature and other secondary sources of data to identify criteria presently applicable for product returns within current companies' CLSCs. All companies analyzed span across various industries such as food and beverage, retail, and electronics. Many of the companies canvassed published detailed reports on their sustainability initiatives and CLSC goals. This information helps determine the products' requirements presently seen in CLSCs and understand the reoccurring similarities among the returnable goods.

Incorporating sustainability into a business plan does not mean it has to compromise on their company's strategies that make them so successful and profitable. In fact, Professor Rebecca Henderson from Harvard Business School states, "You cannot use business to do good

in the world if you're not doing well financially. Doing well and doing good are intertwined, and successful business strategies include both” (Henderson, 2019).

As the world is changing and evolving into a more complex and evolving environment, supply chain management has become a buzzword and key area of interest to many business owners, consumers, and academicians. In more ways than one, a supply chain serves as the backbone of a company, and it is a critical system that can make or break a business’ success. It is the glue that connects a company’s products and services to the consumer. Therefore, the supply chain executives of companies around the world have already begun to develop their own initiatives aiming to act more responsibly towards the environment and society. As a supply chain is all about the processes that include purchasing, manufacturing, logistics, distribution, marketing, and performing the function of delivering value to the end customer, it is important to remember that the responsibility of the product does not end upon the transfer into the customer’s hands. (Turan Paksoy, 2011).

While a company can do the right thing by adopting sustainable practices into every aspect of the supply chain, such as sourcing sustainable materials, creating less emissions at the manufacturing plant, or choosing more environmentally friendly transportation, what happens when product use is over, and it is gone to waste? This is where the closed loop supply chain comes into play.

Closed-loop supply chains (CLSC) are supply chain networks that "include the returns process and the manufacturer has the intent of capturing additional value and further integrating all supply chain activities" (Guide et al., 2003). It combines the “traditional” supply chain which can be known as forward logistics and adds the returns process that can be called reverse logistics. Ideally, it means that while a supply chain is composed of all the steps that go into

producing and distributing a product, a company implementing a closed loop supply chain also focuses on how to return the items back into the forward cycle once the product is no longer useful to the consumer. These products then can be broken down to be reused, remanufactured, or simply repaired to be resold. “The “closed loop” term refers to the fact that the chain is intended to maintain and recover value from unused products, while helping to create as little waste as possible” (Deen, 2017).

An illustration of Apple’s CLSC is referenced below. In the image one can see how there is a reverse flow of product and information that occurs from the consumers use back into the processing cycle, redirecting the material from ending up as e-waste in a traditional forward flow supply chain. The added returns process is included in the supply chain cycle as companies operating CLSCs need to take on the additional responsibility of what happens to the product as waste.

Closing the loop in our supply chain

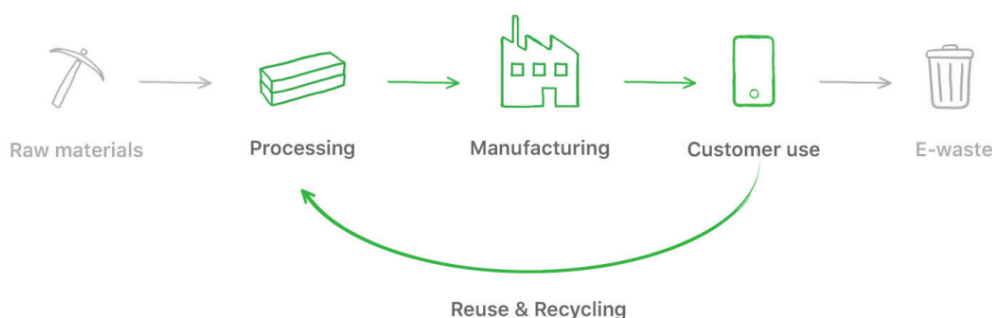


Figure 1: An Example of Apple's Closed Loop Supply Chain Model (Cunningham, 2017)

The purpose of this thesis will analyze how companies can incentivize consumers to return the product, initiating the first step of the closed loop supply chain process. The remainder of the thesis will include the background information of closed loop supply chains and discuss

the current practices already in use, the methods used, the analysis of literature reviews and case studies, and the summarization of the results, as well as discussing any limitations that could prohibit further research on this topic.

Chapter 2

Existing Practices

As mentioned, a closed loop supply chain includes the responsibility and focus on what happens to the product after its useful life is over. Many companies implementing a traditional supply chain are not concerned with the product once it gets to the consumer; their job is done. However, companies that implement a closed loop supply chain strive to get that product back in the future.

There are many benefits and reasons as to why companies implement closed loop supply chains (CLSCs). On an environmental standpoint, the earth has a finite number of resources and at a certain point, these resources can be exhausted. “Each year, companies in the United States generate and dispose of 7.6 billion tons of non-hazardous industrial solid waste” (Norwich University, 2020). In order to conserve these resources and reduce the amount of waste, CLSCs are a successful strategy. The combination of forward product flow and reverse logistics allows companies to reuse materials and transform waste into resources and raw materials used in the production process.

Not only are these efforts rewarding and provide businesses with an enhanced public image from acting responsibly, but also CLSCs have value that allows the company to save on costs and benefit their financial performance. Since companies are using returns to be used as direct materials within the manufacturing process, this gives organizations the option to minimize new materials costs. Additionally, reusing and remanufacturing products and the sale of those items in secondary markets allow for an increase in revenue (Norwich University, 2020).

The process of the reverse logistics aspect in closed loop supply chains involves a few key steps. The first action is receiving the product back from the consumer. This is where this thesis will focus, as it will be discussing the ways companies can incentivize consumers to return the product rather than conveniently disposing it as waste. The next steps involve the return processors who collect the unwanted products and send them back to the manufacturer and distributor to be repaired and resold. If the product cannot be repaired, they will be sent back to be remanufactured or taken apart so that parts of the product can be recycled into something new. If the product is severely defected and cannot be repaired, reused, or recycled, then the company will have the opportunity to collect useful information on why the product developed such defects and reduce costs associated with product development before disposing it as waste.

Many companies are ahead of the regulatory curve and have already adapted closed loop supply chain practices. Some of the companies are Mac Cosmetics, Levi Strauss, and Energizer. Mac Cosmetics' CLSC implementation is called Back to Mac. Other companies, such as Unilever are also in the process of implementing it. As Mac aims to reduce the environmental impact of their packaging, they strive to use recycled material from returned makeup compacts to create new packaging for products. The program has been successful, recycling 100,000 pounds of plastic material, preventing a million pounds of material being sent to landfills as well as saving on 500 tons of energy. Their incentive for consumers to return the packaging rather than dispose of it on their own is for every six empty containers a Mac customer brings back, they are rewarded a complimentary Mac lipstick of their choosing.

Levi Strauss, known for their iconic denim jeans, has a similar but more inclusive return program in their CLSC operation. Every year twenty-four billion pounds of clothing and shoes end up as waste in a landfill, making the fashion industry the second largest polluting industry in

the world (Hower, 2016). In order to reduce the environmental impact associated with the production of retail, any Levi store will accept old jeans as well as shoes, inclusive of all brands, that are then repurposed or recycled with their partner company I:CO. The returned apparel is not just remade into more clothing but can be transformed into many things such as insulation for buildings and cushioning material (Hower, 2016). In order to encourage consumers to bring back unwanted clothing, they offer twenty percent off a single item upon bringing in items for recycling.

Lastly, Energizer has created an EcoBattery, the first battery known to be made up of four percent recycled batteries. While that number seems low, due to the hazardous materials that make up the chemistry of batteries, it is very hard for them to be repurposed or recycled properly, safely, and feasibly. Energizer partners with Call2Recycle, which provides an easy and convenient way for consumers to drop off used batteries to further be recycled and implemented back into their supply chain.

It is important to recognize that there is a criterion that must be present in an industry in order for a company to be able to implement CLSCs. Not all products could lend themselves to be returned or reused, such as perishables and food and drink consumables. Essentially any product that can be manufactured can be remanufactured given the company has the manufacturing technology. Items commonly seen to be present in CLSC's contain raw materials that are able to be recycled and remanufactured feasibly, such as products composing of plastic and glass. Other criteria essential to a products ability to be present in reverse logistics surround hygienic reasons. All products sent back must be able to be cleaned and disinfected before they are put back into the manufacturing process and delivered to another consumer. Companies are not able to avoid cross contamination on used food and personal products. Another industry in

which CLSCs are commonly in use is fashion retail. Clothing and textiles are almost always one-hundred percent recyclable, and it is very easy to disinfect and clean clothing.

The use of a closed loop supply chain does not only have environmental benefits, but also allows businesses to be more profitable and reputable. As consumers and business's change towards having a more environmentally conscious mindset, it is important that we do our best and take actions towards reducing waste while optimizing profits at the same time.

Chapter 3

Discussion of Findings

There is growing attention from companies and consumers worldwide on CLSCs and zero waste efforts, as public awareness of sustainability issues has become increasingly apparent. Because of this, more and more companies are taking the initiative to implement these practices, deeming themselves role models for others in their industry to follow. Now, closed-loop supply chain practices have become vital to any successful, sustainable supply chain.

However, it is essential to recognize the criteria that are typical for products produced by companies implementing CLSCs. This will help determine how companies can best encourage consumers to return their products to streamline their closed-loop supply chain practices. After analyzing the common similarities found in these current practices, three standard criteria were present: consumer's need to replace the product, feasibility of return process for consumer, and monetary incentives in exchange for the consumers return. The research will span across industries and products, including car batteries, personal computers, denim, and skincare.

Criteria 1: Pre-Designed Returns and Consumers Need to Replace the Item

Certain products have a strict need to be replaced at the end of their useful life. This is typically present in CLSCs where the product is essentially a pre-designed return. There are products that consumers are not allowed to dispose of them themselves and are dependent on getting the product replaced. Ultimately, certain products lend themselves to being replaced by the company, leaving nothing other than a new product as an incentive in exchange for the customer returning their used product.

There is an increasing trend in the use of electronic vehicles that has given rise to reverse logistics and return processes. These vehicles contain hazardous batteries, and the government pressures companies to set up feasible return processes and take responsibility for the battery's end of life. The occurrence of returned batteries will only increase with the rising use of electronic vehicles and the automotive industry's efforts to produce more sustainable alternatives. In 2017, over one million electronic vehicle batteries were sold worldwide, and that number is forecasted to hit thirty million by 2030. (International Energy Agency, 2018). As electric vehicle batteries (EVBs) depreciate over time, there is a need for them to be replaced beyond the customer's responsibility or control. The customer, therefore, must return the battery to use the electric car optimally. Therefore, there is no monetary reward or value exchanged by the company in return for replacing the battery, leaving the common criteria present in the products of these CLSCs being the customer's strict need to replace the item. This criterion is prevalent in many of the current practices analyzed, mainly found in the electronics industry.

Customer Incentives and Voluntary Returns

To focus on customer incentives, the remainder of this thesis will develop a two-part class system, containing the two most prevalent criteria in a company's CLSC return process. Differing from the car batteries discussed previously, some products do not need to be replaced or returned by the customer. These returns are considered voluntarily and depend on incentives for the consumer in exchange for the return. It is broken down into non-monetary incentives (feasibility and on whom the burden of the return is placed) and monetary incentives (cashback, complimentary products, discounts).

Non-Monetary Incentives

Criteria 2: Feasibility and The Burden on the Supplier vs. Consumer

Another similarity of the products included in current CLSC practices was the feasibility of returning the product and on whom the burden was placed on. Companies with successful closed-loop processes ensure that getting the product back from the customer is a smooth transition, making sure there are no challenges inflicted on the consumer. Many companies analyzed had feasible and free return systems set up to ease the burden on the consumer of returning the product to the consumer. This type of strategy has been prevalent dating back to the 1950s with the history of at-home milk delivery. During this time, families would place orders with the milkman, who served a similar function to a typical mailman present today. The milkman would drop off reusable, glass bottles of milk in front of the house each day and collect the family's empty bottles from the previous day. This system shows a simplified process of how companies are collecting used products from the consumer within their CLSC. The burden of the return was on the supplier/company, in this case the milkman, not the consumer. This makes it much more likely that a consumer will want to return the product rather than conveniently throwing it in the trash can. This type of burden placed on the company to make a feasible return process for the consumer was a critical criterion present in many of the companies analyzed.

Company A was analyzed as a prime example of this type of criteria. The company sells personal computers made of post-consumer recyclable material in its CLSC to reduce its materials and manufacturing process's environmental impact. The company initiated a take-back recycling program that collected personal computers at the end of their useful life from the consumers. The company's extensive e-waste collection program includes free recycling options in over seventy-eight countries (Clancy, 2015). Under this program, around forty collection

points, most commonly shipping containers, are placed across the country and are run by independent partners of the company that can purchase the e-waste from consumers. Consumers can either drop off their e-waste at a drop-off point of their recycling partners or ship the product back for free using a generated shipping label. Directions and information are continuously provided to the consumer, especially on receipt of purchase, to streamline the consumer's return process. This type of incentive was seen in various industries and products, such as retail, food and beverage, and consumer products and packaging.

Monetary Incentives

Criteria 3: Cash Back and Complimentary Products and Discounts

A company recovers an end-of-life product (EOL) from a consumer in exchange for value to be recycled and remanufactured for later use in a closed-loop supply chain. In most cases analyzed, the company almost always gave consumers a financial reward to incentivize them to return the product, making it one of the critical criteria present in closed-loop supply chains. This has been commonly seen in fashion and retail, where consumers are eager to save on future purchases if it means returning used items rather than disposing of them in the trash.

Thus, the most common criteria present in companies closed-loop supply chains were offering financial incentives.

Company B is a retail company that was analyzed as an example of similar industry practices. The company, which is a brand under a major conglomerate known for selling women's apparel, allows customers to turn in any denim clothing, no matter the size, color, brand, or age, to any of their retail stores across the country in exchange for \$20 off their next

new denim purchase. The company partners with a third-party recycling company and has recycled over 1,000,000 items, saving 548 tons of waste from landfills (Siebenaller, 2020).

Company C, a cosmetic brand retailer across the US that implements CLSC and an initiative called "Recycle and Be Rewarded.", was also analyzed. The company partners with a third-party recycling company to create a free program to send back finished beauty and skincare packaging. Once the consumer finishes the product, they can drop off the empty packaging, such as glass bottles, plastic tubes, and plastic bottles, at any retail location. The waste is then cleaned and remanufactured into pellets that will be remolded into future packaging. Company C differs from Company B in the type of monetary reward that they offer. While Company B gave \$20 back for every recycled denim product, Company C gives away complimentary products and vouchers depending on the number of bottles the consumer returns.

Recaps of Companies Analyzed

All Companies analyzed in this study were kept anonymous and led examples of the three main criteria present in CLSCs. Each company is in the Fortune 500 and implemented a CLSC within the past ten years. A summary of each company representing criterion are as follows:

Company A: Feasibility and the Burden on Supplier vs. Consumer

Company B: Monetary Incentives-Cash Back

Company C: Monetary Incentives- Complimentary Products/Discounts

Chapter 4

Conclusions

This thesis has provided an introduction to sustainable supply chain strategies and background on Closed-Loop Supply Chain (CLSC) strategies. The thesis also discussed existing CLSCs present across a variety of markets, industries, and companies. Building a sustainable future is at the forefront of all successful companies' corporate strategies. Putting sustainable initiatives into practice such as CLSC and reverse logistics requires effort from both sides: the company and the consumers. Thus, the main focus of the thesis has been to identify ways by which retailers can incentivize consumers to do their part in returning the product into the manufacturing cycle so that it could be reused towards reduced waste initiatives.

To recommend how a retailer can influence a consumer's decision to return the product at the end of its useful life, there needed to be an analysis of the criteria for what products lend themselves capable of being returned. In the analysis portion of this thesis, common criteria among products present in existing CLSC were studied to recommend proper incentives.

The criteria were broken down into a three-part classification system. Below are the three common criteria of products present in CLSC that were analyzed.

- Criteria 1: Pre-Designed Returns and Consumers Need to Replace the Item
- Criteria 2: Feasibility and The Burden on the Supplier vs. Consumer
- Criteria 3: Monetary Incentives

Criteria 1 was that certain products are pre-designed to be returned at the end of their use and are a mandated option that makes disposal by a consumer not a choice. This was present in the example that referenced electronic car batteries, where these batteries were required to be replaced by the consumer and brought back to the retailer to provide the consumer with a new battery. Therefore, the consumer cannot dispose of the battery on their own, and thus a closed loop return process is already pre-designed. Therefore, little incentive is needed for the consumer to return the product.

In products that were not required to be returned, companies needed to find a way to encourage the consumer to return the product rather than conveniently disposing of it on their own. Thus, Criteria 2 and Criteria 3 were discussed regarding these "voluntary" returns.

Criteria 2 was that the return process must be made feasible for the consumer, and the burden of the return must be on the supplier. If a supplier would like their customer to return a product, they must make sure that the return process is conveniently designed and that burden of returning the product is placed on the company. Company A was analyzed for this example, as they initiated a take-back recycling program that collected their personal computers at the end of their useful life from the consumers. The company made the return process as easy and convenient as possible as their incentive to encourage consumers to return the product by providing a free shipping label and container and numerous drop-off points run by independent partners to streamline the customer's return process. If the consumer does not feel they are taking additional steps to go out of their way to return a product, they will be more likely to return the product.

Lastly, Criteria 3 analyzed the financial incentives that companies must give their consumers in exchange for returning the product. This was the most commonly seen criteria

among returnable products within CLSCs, as they provided an added benefit to the consumer that encouraged them to want to partake in the returns process. Thus, financial incentives are recommended for all products that cannot be conveniently returned or goods that are not pre-designed to be replaced upon delivery to the consumer. These monetary rewards were cash back, complimentary products, or discounts towards future purchases. Both Companies B and C were analyzed: retail companies that provided cash back incentives or complimentary products and discounts towards future purchases. Company B was a retail company that provided a \$20 cashback discount towards a future purchase upon returning used jeans to any of their stores. Company C operates in the beauty industry and offered complimentary products in exchange for the returned packaging. Therefore, financial incentives are deemed the most influential criteria regarding a consumer partaking in the returns process.

While existing CLSCs were analyzed to categorize returnable products into three different criteria, plenty of markets and products lend themselves capable of being returned that do not fall into the three classes provided in this thesis. Thus, companies referencing this research as a basis for understanding their returns process in their market may need to consider other information specific to their product.

In addition, the end-of-life value of many products is not designed to be reused or replaced upon its useful life to the consumer. Therefore, certain companies and markets will find it challenging to adopt CLSCs as certain products typically cannot lend themselves to be returned. These products tend to have limited durability or have a finite life cycle that does not allow them to be present in reverse logistics. Companies with these products must understand that these constraints could deem their products impossible to be remanufactured. Therefore, they cannot apply to the criteria mentioned in this thesis. A typical example of products that

subject themselves to these constraints are perishables in both the food and beverage and personal care industries.

CLSC and reverse logistics are becoming increasingly popular, yet the implementation of these processes is still new. Therefore, there is much more to learn and analyze as more companies begin to hit the market with zero-waste initiatives that may reach a more extensive scope of products beyond the criteria studied in this thesis.

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The Estée Lauder Companies Inc.

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- Constructed a database for over 350 bottles and their specifications using PDS and identified 6 potential packaging harmonizations across 20 products to reduce supply chain complexity and delivered savings of \$500,000
- Consulted with strategic and core suppliers of the company to discuss harmonization ideas and sent out RFQs in order to calculate cost efficiencies which were presented to brand executive directors of 8 different product lines
- Implemented and planned a collaborative virtual event for over 200 procurement professionals that identified and discussed the need for new formal and informal training opportunities that align with ELC's 9 procurement competencies
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- Created a simulated equity trading strategy in Excel that bought and sold stocks intraday when their volatility exceeded certain levels by developing Profit and Loss breakdowns for the portfolio and stocks on an individual basis for the traders to monitor
- Examined various news services daily prior to the market opening for important company specific and macro events in order to maximize profits and minimize risk in the trading portfolio
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Interchem Corporation

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- Recorded inventory valuations each month in order to track 5000 products that were past due in the supply chain by updating spreadsheets utilizing Excel and the company's ERP software, Sage 300
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