Bryant University

HONORS THESIS

How Do Grocery Stores Utilize Centralized Versus Decentralized Production to Compete in the Power Perimeter?

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ABSTRACT

Purpose - The grocery industry, one of the most important industries that individuals need to survive, has been pushed to the limits, due to the COVID-19 pandemic. The grocery stores that were able to keep food on the shelves, despite all the delays and shortages that have been occurring, should have the most success, due to the availability of their product. Every business is looking for opportunities to be more cost efficient and effective and the processes to do so are heavily researched. The decision to centralize or decentralize the production processes is different for every store. They must consider their goals and their customer profiles, in addition to the specific practices they need to adopt in order to reach those standards. Centralized structures have all the processes done in one location, while decentralized will distribute control to individual plants or business units (Tate et al. 2019). It is vital to research which type of products fall under which production process, and which type of costs that process is looking to save.

Methodology - The research included multiple case study methodology in the grocery industry, covering stores of varied sizes, ownerships, and regions. The production processes of the power perimeter products have been researched in order to determine if grocery stores benefit more from centralized or decentralized production processes and why certain practices are utilized for specific items. Qualitative interviews with grocery personnel have been conducted and analyzed to discover current trends and processes that produce the most success.

Findings – Research has concluded that utilizing centralized production processes is more beneficial for a cost-efficient model supply chain with the goal of reducing physical function costs and if the products used are functional, while utilizing a hybrid/postponement production processes better fits the goals of a responsive supply chain, with the goal of reducing market mediation function costs and if the products are innovative. The power perimeter products have been found to fall under the innovative category.

Value - In a post pandemic world, it is vital to see which processes are the most beneficial, and which can be changed or even eliminated. It will be important to understand how each

grocery store, varying in size, location, and ownership, works through the same issues. Findings of this research will help discover which processes are the best and allow for the most profit, to provide insight for future businesses as they develop.

Keywords- Centralized Structure, Decentralized Structure, Grocery Store Chains, Corporate Structure

Paper Type – Research Paper

INTRODUCTION

A company's decision to utilize centralized versus decentralized production is often related to finding the balance between efficiency and effectiveness. The grocery store industry specifically is one of the most important industries to consumers and having operations run smoothly can make or break their business, due to their razor thin profit margins. Both centralization and decentralization have their benefits, but it is important to look further into specific grocery retail chains to understand which method sets the company up for success. As the topic of supply chains gains more popularity in the aftermath of the pandemic, research is increasingly exploring the most optimal supply chain. Grocery stores are substitutes in an economic sense and consumers will easily change stores if the food they need is unavailable, emphasizing the importance of sufficient supply chains to ensure that the shelves are fully stocked.

A review of the literature has elicited questions for qualitative interviews and case studies to see what traditional methods seem to be optimal, and what information is important to be further studied. A case study has completed of several types of retail grocery chains, with the purpose of identifying production processes that are associated with the power perimeter of the supermarket, which are the products around the outside walls of the store such as produce, deli, and bakery (Levy et al., 2019). For this research, grocery stores will be used as a general term to describe national, regional, and local grocery chains and independent stores.

Research from past articles, in addition to qualitative interviews with grocery store professionals will give more insight as to if centralized or decentralized production processes are the best option to remain competitive. Corporate structure in this research can be seen as the different operational processes that a company chooses to define itself with and how each company competes.

Being an essential business, grocery stores had no choice but to stay open during the COVID-19 pandemic and had to do so in the safest way possible. Forecasting became almost impossible, as no one knew what would happen in the health world, let alone the grocery

industry. Despite the shortage of workers, grocery stores had to ensure that they had enough products on the shelves, especially cleaning supplies. Logistics and transportation became more challenging, as travel was restricted and everywhere from distribution centers to manufacturers had to quarantine at various times, slowing all processes down (Redman et al., 2021).

All this chaos did provide some operational benefits to the grocery store industry, as many stores' willingness to adapt and change led to lasting process improvements. Online ordering became more popular, to satisfy the customers "no-contact" requests. Communication between online and brick-and-mortar channels improved tremendously, because as problems arose within every department, solutions had to be found fast (Aday et al., 2020). In addition to process improvements, cleanliness and standards were raised and never abated. In times of global health challenges, being clean is imperative and many supermarkets set new precedents for how their products should be treated (Aday et al., 2020). Every single supermarket, across the globe, faced challenges due to the COVID-19 pandemic and it changed the industry for good. Consumer shopping patterns that changed dramatically during the pandemic have not returned to pre-COVID patterns. Overall research has suggested that grocery stores now must structure their supply chains to be responsive to fluctuations in consumer demand while remaining cost competitive.

Due to competition from non-traditional formats such as warehouse clubs, supercenters and convenience stores, traditional grocery stores must put extra focus on providing a better shopping experience for their consumers. They are doing this by targeting millennial, green consumers, and differentiating their offerings of and providing more shelf space to perishables, fresh food, and private label offerings. The power perimeter offers grocery stores an opportunity to attract customers and remain competitive in higher margin product categories. Thus, the focus of this research will investigate the balance of cost efficiency with effectiveness/responsiveness of fresh-food power perimeter product categories utilizing centralized versus decentralized production processes. (Levy et al., 2019).

The remainder of this paper is structured as follows. In the next section, relevant research will be discussed on the centralized versus decentralized structure decision, in addition to background of the grocery industry, and gaps will be identified in the research. Following this, the paper will describe the research questions at hand and the qualitative case study methodology used to gain insight into specific grocery stores and their decision-making processes. Findings and results will be shared by drawing conclusions and identifying patterns from the research and case study analysis. Finally, a conclusion will wrap up the research and identify any future subjects related to this matter that could be studied.

LITERATURE REVIEW

One of the main focuses of this research is centralized versus decentralized production processes. Centralized production occurs in one location, while decentralized production occurs in multiple locations, depending on what is the best process to achieve company goals (Tate et al., 2019). The concept of centralization versus decentralization can be applied to many different business processes, such as human resource management, sourcing, and production. Below are both the advantages and disadvantages of utilizing either system approach for production processes.

Why Would Companies Centralized Their Production Processes?

The following section will discuss centralized processes. Among the benefits of centralized processes are standardization, utilizing economies of scale and control of activities. Some of the drawbacks include increased bureaucracy and distance between internal customers (Williams et al, 2020, APICS Dictionary, 2008, Defee et al., 2005). Below is a discussion and example of each benefit.

Standardization

Standardization is a form of SKU rationalization, as companies are deciding which production processes for certain items are profitable and convenient, then adjusting if necessary. A SKU can be defined as a stock keeping unit and is used by retailers to identify and track the individual unit. Implementing a standardized process that can reduce the number of SKUs by offering a common SKU that serves all needs can be a competitive advantage. When the

process is more standardized, time and money will be saved. (Williams et al., 2020). Having standardized SKU production processes allows for consistent orders which can save the company money and keep processes consistent (Tate et al., 2019). If the company follows a production protocol, all the items will come out the same which will avoid potential waste if the items are not up to their standards. If everything is done in one location, tasks such as placing purchase orders do not have to be duplicated. Administrative costs are lowered, and time is saved due to the elimination of the duplicated tasks (Tate, et al., 2019). A good example of standardization would be how a store would eliminate multiple sizes of the same item and only produce one size. A grocery store could eliminate selling multiple sizes of a sandwich that uses the same ingredients. This would make production easier, standard, and simpler, reducing costs and saving time.

Economies of Scale

Economies of scale is a phenomenon whereby larger volumes of production reduce unit cost by distributing fixed costs over a larger quantity (APICS Dictionary, 2008). Utilizing this practice allows companies to produce more products at a lower cost as fixed costs are spread over more units. Taking advantage of the increased volume can lead to discounts and improvements within the infrastructure. (Heakal, 2021). Economies of scale have been observed to play a vital role in firm's sourcing patterns (Chen et al., 2015). For example, mass producing items like sandwiches can save a grocery store money due to fewer changeovers and less downtime during production and volume discounts on the ingredients used.

A key aspect of economies of scale are learning curves, as they are a factor when looking at the time spent on a task and reduction of costs. Learning curves are the idea that as repetitions of the work are completed, workers will take less time to perform the task, leading to an increase in production. This is due to familiarity with the operation and newfound shortcuts to execute the task quicker. (Anzanello et al., 2011). When production is increased, the learning curve is in effect, fixed cost-per-unit is decreased, and the company will save time and money overall due to economies of scale. For example, when the employees who are cutting fruit for a grocery store have had experience with the process, they are able to increase their

production speed which leads to a higher output of product in a shorter period of time. When the employee first starts, they will be more unfamiliar with the process, will take longer and will produce less output.

Control of Activities

Centralized planning has led to better control of activities and greater flexibility in logistics firms. The more control that a location has, it is hypothesized that it can lead to more coordination and constancy of the products. (Defee at al., 2005). Stank et al.,(1998) explain that all production being controlled in a singular location can lead to strategic decisions being integrated and focused on a common direction. Employee processes and communication are made easier, as there will be no inconsistencies in relaying information if everything is done in one location (CFI, 2023). When operations are done in multiple locations, managers have less control over what has and will happen to their products. For example, in a central location, sanitation can be controlled because managers are aware of all the processes that go into making each item and can ensure that sanitation processes are followed. This may not be able to happen if the process is decentralized.

Why Would Companies Decentralize Their Production Processes?

The following section will discuss decentralized processes. Among their benefits are better responsiveness and relationships with internal customers. Some of the drawbacks include duplication of processes and missing out on volume discounts for the products. Below is a discussion and example of each benefit.

Better Responsiveness

In a decentralized environment, as decisions are made where the production processes take place, it is easier to respond to local needs, unique requirements, and unforeseen events (Tate et al., 2019). Responsiveness to unanticipated fluctuations in demand can be improved by having problem solving decisions handled locally, or on an individual basis. On-site managers may make the best-informed decision, as opposed to someone at the corporate level. Rapid problem solving at the local level is key for a smooth functioning supply chain (Defee et al., 2005). More local relationships with suppliers can gain their trust and help if a product must

be expedited (Tate et al., 2019). One of the key advantages to utilizing decentralization and a more responsive process is the utilization of postponement. Postponement is the practice of delaying final differentiation of products until precise customer order information becomes available. A customer-oriented view of operations is one of the key facilitating mechanisms in the implementation of postponement (Yang et al., 2009). A decentralized approach facilitates customization of the products in order to best meet customer demand. Being able to respond to customers' needs will allow for an increase in profit, as customers will buy the items they want if they are in stock.

Relationships with Internal Customers

With a decentralized approach, there is an opportunity to build closer relationships with internal customers, or the people who are working with the product. Being closer to the employees leads to better communication and a better understanding of what the consumers want. This knowledge can allow for better suggestions about new technologies or substitute parts. A better relationship with the people using the capital equipment in production will lead to an easier implementation of suggestions or process improvements (Tate et al., 2019). For example, a store employee may be able to recommend using a different type of scoop for fulfilling frequent consumer orders of containers of mac and cheese, if they feel it may be more productive. Utilizing a decentralized approach allows workers to provide feedback on how a process is working.

Drawbacks of both Centralization and Decentralization

Tate et al (2019) explain a few drawbacks and limitations to using both a centralized and decentralized production process. A centralized production process can increase bureaucracy, due to the sole location in which the work is being done resulting in less spread-out decision making. In addition, a centralized location creates distance between internal customers at different stores and local suppliers that support them and their production. There is less flexibility, as only one location is being utilized, so production process problems may be harder to solve due to a potential lack of resources in that singular location.

In terms of a decentralized model, duplicate efforts are more likely, resulting in a loss of time and money. The employees are doing the same process at different stores, which can be counterproductive and unhelpful to the company's bottom line, in addition to resulting in inconstancies in product quality. Not having the items used in the production process bought in bulk can lead to increased costs, as well (Tate et al., 2019). Both structures have benefits and drawbacks, but it is important to look at the bigger picture of the grocery industry to better analyze and draw conclusions about which structure fits best for each processes.

Grocery Industry Research

There has been an abundant amount of research done on the grocery industry, but it is more focused on logistics, supply and demand, and improvement of the processes in place. Wagner et al., (2005) have articulated more about supplier development and how if done right, will lead to competitive advantage. If the collaboration between the two parties is more frequent, there is more room for development and growth in the relationship, leading to higher profits for both parties (Wagner et al., 2005). The process of planning and forecasting demand within a grocery chain has been researched by Hübner et al., (2013), more specifically about the decision-making processes, complexities, and implications on the matter.

A review of the grocery industry literature reveals that there is a lack of research exploring the effectiveness and efficiency that centralized vs decentralized production has on the customer, and which is more successful. The production of items merchandised in the grocer's power perimeter, such as baked goods, sandwiches, fruit platters, meats, etc. and whether doing that in store or having it outsourced externally in a central facility has little research.

Efficiency and Effectiveness

There has proven to be a gap in the grocery industry research that explains how the heavily researched production processes are affecting the customer directly. Efficiency refers to the cost of the items and how the supply chain must function to provide the product in demand for the customer at an acceptable cost (Fugate et al., 2010). Cost efficiency is accomplished through reducing operating expenses and optimizing use of fixed or working capital throughout the supply chain. (Kirchoff et al., 2015). Effectiveness focuses on customer demand and how responsive the supply chain can be to unanticipated fluctuations in demand.

It can be further explained as the ratio between actual and expected outputs (Fugate et al., 2010). An effective supply chain can meet consistent product availability in order to satisfy consumer demand. Improvements are made through quality management, buyer-supplier collaboration on production processes and designing products to meet consumer needs (Kirchoff et al., 2015). Fisher (1997) has researched that it is optimal to structure the supply chain based on whether the product being produced is categorized as innovative or functional. Functional products are basic and staple items that have predictable demand, are easy to forecast and used on a frequent basis by the consumer. Examples include bread and milk. An innovative product has unpredictable demand and needs more attention to the forecasting and planning of the commodity, such as items that are trending in fashion, food, and diet.

Companies need to either find a balance between the two different approaches or work to approach one in a way that will help their business. Utilizing both strategies can help a company to have lower costs, while meeting customer demand and not having to sacrifice either. It is important to decipher which combination of efficient versus effective processes are needed based on the product mix which includes both functional and innovative products. A centralized structure is a more cost-efficient practice, as economies of scale can be utilized but it may be less responsive to demand fluctuations (Heakal, 2021). A decentralized production process may be more effective, as responsiveness and internal customer relationships are prioritized, but it may be more costly. Further research within this thesis will determine if cost efficiency, effectiveness, or a combination of both will create the most optimal supply chain.

Fisher (1997) speaks on innovative versus functional products and how supply chains align their strategies with each type of product. Fisher (1997) distinguishes between both physical function and market mediation function costs. Physical function costs include production, transportation and inventory costs and reduction of these costs should be the focus for functional products in a supply chain. Market mediation function costs are what the grocery store would lose due to inaccurate demand forecasting resulting in stockout or overstock of products, and ultimately lost sales or markdowns. Reducing these market mediation function costs should be the focus for innovative products in a responsive supply chain. For innovative

products, if the market mediation function costs are reduced due to better forecasting and planning, the company can then set their focus to the physical costs and limit those to have an overall lower cost of their product. When lead times and inventory are reduced, the costs will go down. The product design strategy can be explained as wanting to maximize performance while minimizing cost (Fisher 1997). Efficient supply chains focus on reducing physical function costs, while effective supply chains focus on marketing mediation costs.

Efficiency within a Grocery Store

Cost efficiency within a grocery store is vital because it is a highly substitutable industry and consumers will usually have no problem going elsewhere. Cost efficiency is about managing resources wisely, in order to have the lowest cost for the consumer in an industry with very tight margins (Fugate et al., 2010). Utilizing an efficient model can reduce cycle time, inventory, inventory carrying costs and provide for a leaner supply chain overall (Kirchoff, 2015). Less inventory in a supermarket is vital, as the food could expire or go bad, meaning the company cannot make any profit from it. Cost efficiency can be a competitive advantage among other grocery stores if the strategy is utilized properly. The lower the costs of the products in the supermarket, the more customers they will attract, especially since the grocery industry is highly substitutable.

Effectiveness within a Grocery Store

An effective, responsive supply chain is needed for innovative products in a grocery store because demand can quickly change and the supply chain itself will need to be able to adapt to fill the orders and ensure that the product is available for the customer. For example, the to-go food bar, including soup and sandwiches and salads – hot versus cold offerings – may have differences in consumer preferences due to local weather conditions. Community events or special occasions will cause changes in local consumer demand, as well, and will be different for each individual store.

Ultimately, the decision to utilize effective or efficient processes is based on the store production, in addition to their specific goals. The day-to-day planning is key to ensure the

right products make it to the shelves and can be replenished. Retailers are constantly under pressure to have the most efficient and smooth flowing supply chains, to not miss any business (McCarthy-Byrne et al., 2010). It is vital that the grocery industry categorizes their items as either functional or innovative based on demand patterns, so that they can be ensured they have the right amount of product at the right time (Fisher, 1997). A grocery store that is well prepared for the forecasting and planning of their products is one that will be successful. Fisher (1997) explains that building effective processes that are responsive to customer demand must also consider profitability, which is cost efficiency, by minimizing stockouts, markdowns and obsolete inventory.

Merchandise Branding

Fresh merchandise, such as foods located on the power perimeter, may require a more effective and responsive supply chain, as the food is perishable. Fresh food items are used to build foot traffic and create unique competitive advantages through the use of store and private label brands (Levy et al, 2019). The following section describes merchandise branding and the difference between national and private label brands. Both are described, followed by reasonings as to why a consumer would prefer one over the other. Discussed below are a variety of reasons why a consumer may choose one type of brand over another and the implications behind it.

National and Private Label Brands

National brands are created by a vendor and then sold to retailers, being independent from the store they are sold to. National brands are not developed by the store itself. Examples include Hershey's, Lays, and Colgate. Private brands are developed by retailers and represent the store that they are in. For example, one of Target's store brands is "Up & Up" while a store brand from Shaw's Supermarket is "Signature." Profitability, flexibility, and assortment are all considered when retailers are deciding to use either private brands or national brands and how much of each to sell and display in their grocery store (Levy et al., 2019). While private label brands are known to cost less from a consumer standpoint, it is important to research and investigate which brand the consumers prefer, and why.

Private label brands, or store brands, have developed over time, adding quality but costing less than national brands. Customers are beginning to care about more than just price and shifting their focus to additional care about sustainability, ethics, social responsibility, and more (Gielens et al.,2021). Both national brands and private label brands need to keep these issues in mind when competing for customer business. Forecasting is improved, leading to higher profits and more customers' needs being met due to the availability of the products fitting the consumer's needs (Gielens et al., 2021). It has become less about a well-known brand and more about one that delivers to customers' needs and provides satisfaction with a quality product. As customers decide what is important to them, they have started to gravitate more towards private label brands, as sales were up 12% from 2019 to 2020. Companies are using private label brands to develop their store brand image and make it more known among customers who shop at their stores (Harfman 2021). Canning (2021) explains that "store brands now account for 18.1% of dollar sales in supermarkets and 21.5% in mass/club/dollar stores. And they represent 22.3% and 25.5%, respectively, of unit sales." Canning (2021) mentions how supply chain disruptions amidst the pandemic resulted in consumers gravitating to the private label brands that were available on the grocery store shelves while national brands were in scarce supply. It is important to consider the consumers' wants and needs when discussing private or national brands on the grocery store shelves. Private label brands are typically more cost efficient thereby providing higher margins, but for store brand items in the power-perimeter, grocery stores are balancing efficiency and effectiveness by choosing centralized versus decentralized production processes.

RESEARCH QUESTIONS

The research questions look to analyze the overarching themes of the research, focused on centralized and decentralized production in the grocery industry. The questions below look to investigate further on the reasonings behind a grocery store utilizing either a centralized production process or a decentralized production process, efficient and effective supply chain methods, and their implications, and finally an insight into the benefits of either process.

RQ1. *Why do grocery stores decide to utilize a centralized or decentralized structure for their production processes for the power perimeter products?*

This question looks to follow the big picture themes of the research and determine which structure is better to produce power perimeter products. Comparing and contrasting a centralized versus decentralized production process will allow for conclusions to be made about utilizing either for the power perimeter products.

RQ2. *How do efficiency and effectiveness goals inform the decision to have a centralized versus decentralized production process for the power perimeter products?*

Efficient and effective goals will shape how a grocery store decides to implement their production processes, as they will either focus on being more customer responsive or having lower costs. The production processes that stores implement are influenced by the efficient or effective goals that they have.

RQ3. *What are the benefits for utilizing a centralized or decentralized production process for power perimeter products?*

It is vital to analyze the benefits of both a centralized and decentralized production process in order to make recommendations and suggestions for stores who are trying to implement the same production processes for their items. Knowing the benefits can allow for further insight and a better understanding of why a grocery store may choose to implement one structure over another.

RESEARCH METHODOLOGY

Research in Case Study Analysis

Research that has been completed on case studies has proven to be extremely important with the process of creating and developing a case study. The products that are being researched include the power perimeter products, such as meat cuts, deli meats and sandwiches, produce, to go meals and bakery items. It is important to start with research on the subject, and find gaps, then form questions that best fit the goals (Barratt et al., 2011). Yin (2003) recommends that case studies are the appropriate method for studying How and Why questions, to get the most in-depth answers to the research. Case studies provide an interesting opportunity to research complex phenomena in a direct or firsthand way that do not require behavioral control of events. The more cases studied; the more information can be used for analysis. It has been suggested that one of the best ways to describe findings is with a chart or diagram, to explain analysis and information given during the case study (Barratt et al., 2011).

Miscommunications or misunderstandings of case studies stem from different ideas of the goals. Ellram (1996) researched the distinctive design elements of a case study, and the most effective way to get the most out of the study. Qualitative data techniques are touched upon and more specifically, how to record measurements and go about the actual interview (Ellram, 1996). Selecting the right candidates and having the most accurate information will lead to the most accurate conclusion about the hypothesis (Voss et al. 2002).

Case Study Process

To answer the research questions, a multiple case study analysis was completed on three diverse types of grocery stores. These grocery chains were selected because of their difference in size, location, ownership, and other factors, to gain full knowledge of many companies and be in the best position possible to conclude the analysis. A set of qualitative interviews took place with personnel of each grocery store chain. Completed over the Summer and Fall of 2022 and Spring of 2023, these interviews helped to gain insight into the processes that each grocery store uses. An interview protocol was developed (found in Appendix 1) to explore the production processes of each grocery store and how they determine if they will have a

centralized or decentralized production approach for power perimeter products such as meat, produce, to-go meals, deli, and bakery items. The main goal was to discover if they butcher, bake, assemble, etc. these products at each retail location, if there is a central location where these processes are executed, or if they are sourced from a supplier. An additional goal was to learn the objectives of the decision to centralize or decentralize production, for example increased cost effectiveness or increased efficiency/responsiveness. These qualitative interviews gave further insight as to the behind-the-scenes of the grocery chains and how they operate, at all distinct levels. Prior to conducting interviews, a proposal was submitted to and approved by Bryant University's Institutional Review Board. A CITI Program Certification was completed prior to conducting the interviews, in the Social and Behavioral Research group (Appendix 2).

Seven interviews with employees across the three companies were conducted, with various levels of experience and length at the company. It was important to gain insight from multiple perspectives to get the full picture of the production processes behind the items studied. Table 1 provides a descriptive summary of the case study informants.

To be as prepared as possible, it was important to have full knowledge of the task at hand to inform development of the interview protocol and ask any important questions to garner as much information about their processes as possible. The same questions were asked for every grocery store, with follow-up questions based on the responses, but the main focus was on the production process, why it was chosen, and what the advantages and disadvantages are.

Case study methodology is appropriate for this topic as a qualitative interview gives the most accurate and valuable information to the topic at hand which is largely unresearched. Learning firsthand from the individuals who make the decisions themselves provided the best insight as to what is the best way to handle centralized versus decentralized production. The most important aspect was to gain insight on how each different grocery store makes decisions about their production processes and then compare them to determine if patterns emerge.

Grocery Store Sample

Three different grocery stores were chosen due to differences in their size, location, ownership, and values (see Table 2). Grocery store A, a large regional chain owned by a national parent company, was the largest store studied and has over four hundred stores in five different states. They are privately owned by a parent company and have been around since the early 1900s. Grocery store B is the second largest and is a regional chain. They have almost twenty stores in the three different states and are privately owned by a parent company, founded in the mid-1900s. Grocery store C is the smallest and only has one location in New England. It is a family-owned independent store that has been in business since 1950. Using multiple cases represented by a variety of sizes and ownerships within the grocery stores researched will ensure that all production processes are studied and compared accurately.

FINDINGS

Grocery Store Data

Store A General Information

Grocery store A was the largest of the three case studies. With over four hundred stores regionally located across five states, they are privately owned by a parent company. Through case study research, it was found that they are part of a hybrid (both centralized and decentralized) model in terms of the power perimeter food items such as to-go meals, deli, produce, bakery, etc. They have a central facility where each of these items are made and then distributed in finished and packaged form or partially processed form to the store's distribution centers to later be sent to the stores. This central facility (CF) is operated by a third party, but owned by the parent company of store A, which also provides on-site management oversight of all processes. For cuts of meat, Store A has an additional facility in which all operations take place, for the meat to then be distributed to the stores.

Within the CF there are different areas for fruit and vegetable sanitizing, fruit and vegetable cutting, deli sandwich and to-go meal assembly, and inventory staging and picking location for goods to be delivered to the distribution centers and subsequently distributed to individual stores in the region. Economies of scale are utilized in the sense that more products are being ordered from this central facility to then be distributed, reducing costs due to increased volume. Each product is planned, and the facility processes different items, depending on the daily schedule. Standardization is utilized with Store A, as they have the same items produced on different days, so production processes are more uniform, and products can be made quicker. The workers must reach the quota of the food to be processed and safety, sanitation, quality, and uniformity are their top priorities when handling and producing the items.

Store A follows a modified cellular manufacturing process for their assembly lines which can be defined as "a group of workstations, machines or equipment arranged so that parts can be assembled progressively from one station to another without having to wait for a batch to be completed or requiring additional handling between operations" (Weber, 2004). Utilizing this process allows them to fit customer demand, as the changeover time is shorter so employees

can make more items, while also gaining the benefits of cost efficiency from a typical assembly line.

There are a variety of factors to the reasoning behind this process. Since store A has the largest number of locations, is the biggest, and performs on a much larger scale, they have a higher demand for each product that needs to be met for the stores and a higher volume of food overall. A primary goal of centralizing manufacturing is to control the quality of the food, the raw materials and finished product.

Taking the labor out of the individual stores has allowed this company to save money, in addition to being able to more closely monitor the consistency, quality and safety of the food that they are producing. Store A's model values both effectiveness and cost efficiency because they want to have the right products and meet demand for their customers, while also still trying to have low costs. As will be discussed in more detail below, for some products Store A employs hybrid processes, which will embody both centralized and decentralized production processes. Utilizing a centralized production process then a decentralized production process for items such as meat cuts and produce, allows for customer demand to be met through an effective supply chain, while also utilizing cost saving practices for an efficient supply chain. This concept was captured in the following quote:

"We are changing our culture and really trying to be smarter about what is the actual total cost of ownership, our organization is transitioning to be more focused on that, not lowest cost." - Vice President of Retail Innovation, Store A

Store B General Information

Grocery store B was the second largest grocery chain, with almost twenty stores across three states. They have recently been acquired by a privately owned parent company. They have a centralized model, meaning that they get items used for the power perimeter from a wholesaler and use in-house production processes to assemble, package and merchandise the products. Store B believes they can control the products and their quality with this model. For example, Store B will receive the individual food ingredients for their to-go meals at each individual store and then assemble the necessary products together in house. Standardization

is utilized, in the sense that the parent company has centrally developed standardized processes in each store to be executed in a decentralized environment to gain a few of the benefits of centralization such as uniformity, quality and sanitation. This process is uniform for all stores. Any decisions about production processes are made by their parent company at the corporate level.

Store B uses this model to have more knowledge of the products that they will eventually be selling to their consumer. Store B wants to be able to control the freshness of these items and take full advantage of their shelf life. A key advantage of decentralizing is being able to respond to customer needs for freshness. If the store can better control the food that they are merchandising, to better fit customer demands, their profits and customer satisfaction will increase. Store B is able to upsell the product because cutting and packaging allows them to charge a higher price and get more volume, compared to putting out a whole fruit. A whole watermelon could sell for $5, but washed, peeled, and cut, could sell five different containers for $3 each, resulting in a higher profit margin. Convenience attracts many customers and makes this process a clever way to increase profits, by utilizing a markup strategy.

Store B has a more effective model in the sense that they are very customer response oriented. They value having the right demand and products for their customers, as their customers would pay more for better quality items. Store B values their customer relationships, as they are a “service-based supermarket” that competes more on service rather than low cost mentioned by one of the interviews associates who works directly in the deli department in the store.

Store C General Information

Grocery store C is the smallest of the stores studied within this research. They are a small, family-owned independent grocery store with one location in New England. Like store B, they have a similar model where the items researched are part of a centralized model. The products will come from a wholesaler and are individually organized into the power perimeter to then be sold in house. Store C follows a centralized model because they do everything in one location, which is their store. A few of the items used by Store C are centralized at the wholesaler, for example bread dough or parbaked muffin batter that is

processed centrally by the wholesaler and distributed to Store C, in addition to other customers of that wholesaler, for final processing. The owner at Store C values the importance of the relationship with your wholesaler, mentioning that, *"You need to be a partner with your wholesaler."*

This model is executed for a variety of reasons. The quality of the items is important to store C, and they can control how they are merchandised. In terms of the meat, they have full control over the quality and freshness, something their customers value. Though the bakery items come parbaked, it is easier and quicker than doing that labor themselves. This processes saves the time that an employee would have to spend baking each individual item. The Owner at Store C mentioned that *"Not one thing is going to save you enough time where you could cut three hours,* when referring to the decision to receive the bakery items parbaked, as mixing and pouring batter for items do not save them time overall in the production process.

More experienced employees working in areas such as the butcher department will translate to a higher quality product for their consumers, leading to higher satisfaction and retention. Store C can control the quality of their items and processes, since it is all done in-house. Saving time is another factor, but freshness and quality are the main reasons that store C chooses to follow a centralized model. Since they are a singular grocery store, it makes the most sense and is the best for their business. They would consider themselves an effective model, like store B, because their customers value quality and store C's competitive goal is satisfying consumers' needs and meeting any demand necessary.

Individual Products

See Table 4 for summary of individual products in the power perimeter and their specific production process.

Bakery Items

Store A has a combination of procedures that they utilize for bakery items. The only bakery items that are received fully baked from a wholesaler and then used in production in their CF are baked goods for sandwiches. Hoagie rolls and loaves of bread are delivered to the CF

from a wholesaler already baked and are then used in production of sandwiches. Ciabatta rolls follow a different process, as they are delivered parbaked to the CF, baked and then used for production of the sandwiches. Other bakery items, such as muffins and cakes, will be delivered from the wholesaler to the distribution center to then be sent to the store, or the bakery items will be made in the individual store bakery. Store A follows this process as it allows them to be able to produce freshly baked items that can be customizable to the consumer. Stores B and C get the items delivered to their individual stores parbaked from wholesalers, then any final baking is done in the stores. These production processes allow the stores to follow a more customer responsive production process which allows for customization and meeting customer demand (See Appendix 3).

Meat Cuts

Store A has a second central facility in which all their meat cutting takes place, separate from the CF that produces produce, deli and to go meals. The wholesale cuts of meat such as beef, will be cut to smaller and more manageable amounts, but not the final cut, and distributed to the individual stores for the final processing and packaging. Stores B and C receive their meat, not fully cut, but rather cut into bigger pieces, from wholesalers and finish cutting, packaging, and merchandising it in their individual stores. Store C leverages their butchering skills in this department to create a competitive advantage, as the quality is improved. Store C is known locally for their high-quality meats and has gained a reputation that has created loyal customers. This allows them to offer more value than a grocery store who may not have as skilled labor and allows them to potentially gain higher margins (See Appendix 4).

Deli Meats and Sandwiches

Store A assembles all sandwiches in their CF, with an assembly line format, utilizing the cellular manufacturing process mentioned above. All the food is prepared for the workers and precise instructions are given for each sandwich, with different sandwiches being made on different days. The sandwiches are assembled and cut on an assembly line before they are packaged and labeled to then be sent to the distribution center and then to individual stores For deli meats, Store A has a “grab and go” section next to their deli in each individual store

and the deli meat and cheese gets cut and packaged in house at the deli counter. Store A is looking to implement an automated process in their CF, for which capital equipment would be used to cut and package the deli meat in that central location and distribute it, through the distribution centers, to individual stores. This process would replace in-store labor performing this task. Stores B and C do these procedures in-house in their individual stores after receiving the deli products from a wholesaler (See Appendix 5).

To-Go Meals

To-Go meals refer to the already cooked meals that have been boxed and merchandised, such as mac and cheese or spaghetti and meatballs. Store A has a similar centralized assembly line process with their to-go meals as they do with deli sandwiches. All the food is assembled and packaged in the CF on a conveyer belt, then sent to distribution centers to subsequently be sent out to the individual stores. Stores B and C receive the individual and separate products, to be used in the to-go meals from a wholesaler, or they make and assemble the meals in store (See Appendix 5).

Produce

Store A washes, peels, and wholesale cuts fruit at the CF for further processing at the store level. After it is sent to the distribution center and later to the individual store, it is further processed, retail cut, packaged, and merchandised in order to meet the customer demand. Stores B and C do this entire process in each store after receiving the fruits and vegetables from a wholesaler (See Appendix 6).

RESEARCH QUESTIONS AND RECOMMENDATIONS

RQ 1- When to Utilize a Centralized versus Decentralized Approach

When the research and interviews were completed, it was evident that the production model chosen was based on the individual item and to strike the right balance between efficiency and effectiveness. Products such as to-go meals and deli sandwiches follow a more centralized production process, for Store A only, as Stores B and C do not have the resources to utilize a CF and all the benefits that it brings. Store B is owned by a parent company and has an opportunity to utilize the volume to set up a CF, and Store C could reach out to their wholesalers and suggest that they set up a process including other grocery stores of the same volume to replicate the CF operation. In addition, both Stores B and C could investigate a third-party option. Deli sandwiches and to-go meals fell under the category of a cost-efficient model, as they were made in a central location to save money on time and labor and to control the quality and consistency of the assembly process without compromising freshness. These products do not need to be as customized or specific as the other studied items and economies of scale can be utilized for mass production. When both companies and customers value uniformity over customization, a centralized model is the best approach. This model allows them to be responsive to customers' needs while also reducing physical function costs, as reflected in the following quote…

"The supermarket retail business is tough…you are always looking for ways to cut costs"-Vice President of Retail Innovation, Store A

For items such as produce, bakery and meat cuts, a hybrid and effective model is more appropriate for the store goals and customer needs. Meat is retail cut and merchandised at the individual stores to meet specific customer demand for each specific store. The same process goes for cut fruits and vegetables. Bakery items are delivered parbaked, then can finish baking in store to save time without compromising freshness, and to meet the specific customer demand. Utilizing a hybrid approach for production allows the items to be initially cut and prepared centrally at one location, then further processed, and merchandised at the individual store. With the store making the decision on how to process, package, display and organize these items, customer demand can be met based on the specific needs of the store.

Postponement is the process of delaying differentiation until as late as possible to meet customer demand. This strategy is utilized with the meat, bakery and produce items in a hybrid approach, as differentiation occurs at the individual store based on customer demand patterns. For example, the fruit is washed, peeled, and partially cut at the CF, then further cut, and merchandised at the individual store to match customer demand. Research has concluded that utilizing multiple locations, with a hybrid production process, for these specific items is the best for their profits as it reduces market mediation function costs such as overstocks and out-of-stocks. An effective, customer-oriented model allows for demand to be met and limited loss of profits due to not having the right product in the right quantities.

Cost Reduction Efforts

Further research determined that a centralized production process had the main goal of saving physical function costs, which are the basic costs such as inventory, production, transportation, etc. If the centralized production processes can utilize standardization and economies of scale, the process will save money. Since centralized production processes are focused on being cost efficient, the focus is shifted to saving money on the physical function costs such as production and inventory and not the market mediation function costs that would be profit lost due to inaccurate forecasting. The main goal of physical function products is to have the lowest costing product possible. Hybrid/postponement production processes have been deemed more beneficial for innovative products, with the goal of optimizing the balance between reducing both types of costs. They allow for reducing physical function costs, but without sacrificing responsiveness and reduction of market mediation function costs. As mentioned earlier, market mediation function costs are a result of inaccurate forecasting, and innovative products are hard to forecast, as they have unpredictable demand. The goal is to meet customer demand through a responsive supply chain. The more responsive the supply chain is, the less products will have to be marked down and less money will be lost (Table 3).

<u>RQ2 - Efficiency and Effectiveness Goals Informing Production Process Decision</u>
Research has shown that the primary goal of the production processes of the power perimeter items is to have a responsive supply chain that is focused on customer demand. Since these

products are shorter shelf-life items, it is vital to have production processes in place to maximize freshness, in addition to maximizing the profit margins, as they are already slim in the grocery industry. The power perimeter products fall under the innovative category, for which the demand can fluctuate, and the items may be harder to forecast, as they are trendier. An effective supply chain works to meet customer demand to maximize the value (freshness and profit) of the power perimeter products.

The secondary goal would be to implement a cost-efficient supply chain, but not at the expense of accomplishing the primary goal. Cost reduction is important in the grocery industry, as the profit margins are slim, and stores should cut costs when they can. The physical products, brought in by a responsive supply chain, are a higher priority than focusing on cost reduction first. Although both an efficient and effective supply chain are important, research has shown that the primary goal should be to implement a responsive/effective supply chain.

RQ 3- Benefits of Centralized and Decentralized Production Processes

The initial benefits of both processes were listed in the literature review above. The benefits of a centralized production process are standardization, economies of scale and control of activity. The benefits of a decentralized production process are better responsiveness and relationships with internal suppliers. Research shows that a combination of both centralized and decentralized production processes yields the best result. With a combination of both, a grocery store can meet customer demand but at the lowest possible cost. The grocery stores must have the resources to do so, or they will be limited to only implementing one process.

LIMITATIONS AND IMPLICATIONS

The original research questions were focused on insourcing and outsourcing in the grocery industry. Research was conducted about the benefits of both and the factors influencing the sourcing decision. After completing the case study and qualitative interviews, research shifted to a focus on centralized and decentralized approaches, The stores studied were not outsourcing to any outside companies to do their power perimeter production processes, but rather utilizing a centralized or decentralized model for different items, to reach their profit and production goals. However, based on the recommendations above, smaller grocery stores that do not have the resources for a hybrid approach may consider outsourcing to a 3rd party.

All the stores studied utilized insourcing, whether they had a parent company own a facility for the production, or just directly doing it in house in the individual store. The interview protocol and main themes of the interviews were about insourcing and outsourcing, as that was the original focus of the research. All questions asked in the interviews and on tours were about the production processes and how they related to insourcing and outsourcing. Interview questions can be found in Appendix one, but they follow a different pattern than the final conclusions of the paper. The research questions shifted as a result of findings from the case study and interviews. Research has concluded that a company utilizing a centralized production process better fits the goals of a cost-efficient supply chain model and a decentralized production process would work better with an effective supply chain.

Implications for Consumers

A recent study explains that 64% of adults have reported purchasing ready-to-eat meals in a month, contributing to a $29 billion annual market (Levy et al., 2019). Grocery stores are aware of the substitutability in their industry and that they must have practices that set themselves apart. Enhancing their products to fit a different consumer base or introducing new services such as online ordering or hosting social events are popular strategies used by supermarkets to differentiate (Levy et al., 2019). Knowing where the food on the table comes from is becoming increasingly important as consumers become more aware of the nutrients that they are putting into their bodies. It is important to understand the freshness behind the items bought and their product life cycle. A customer focus on lower costs versus quality and

availability of products is vital, as recent inflation has led to higher prices. A consumer must decide what they value more, or if they can find a balance within their purchase.

Implications for Grocers

Utilizing the best strategies for each individual grocery store is important, as customer segments and needs are different. Community events and profiles will contribute to different demand and grocery stores need to be aware of this to not miss out on profit. The grocery industry is highly substitutable, and consumers will easily go to another store if the desired item is unavailable. Many varied factors contribute to the reasoning behind if a grocery store should utilize a central versus decentral production process. Size, location, ownership, and resources are some of the main factors that play a role in how these decisions are made. Post-Pandemic implications must be considered as well, as new purchasing patterns, such as online ordering, have emerged within consumers. They may be more likely to buy more cuts of meat in efforts to avoid crowds at restaurants if they want a fancy dinner. There are numerous other instances like this, but it is important for grocers to understand which production process is the best for them and their budget, in addition to if they want to focus more on a cost efficient or effective model.

Utilizing a cost efficient versus effective model is essential for grocers to specify as well. A grocery store should emphasize either or find a balance between both. If lower costs are more of the goal, then a cost-efficient model would be the best idea. If customer responsiveness and meeting demand provides greater customer value, an effective model is a better fit. Choosing a centralized, hybrid, or decentralized structure that fits better with each of the methods and implementing the right one is key for a grocer.

ETHICAL CONSIDERATION

IRB Approval has been granted and CITI Certification has been completed (Appendix 2).

APPENDICES

Appendix 1 – Interview Protocol

Interview Protocol
Insourcing vs Outsourcing in the Grocery Industry

The purpose of this in-depth interview is to better understand the insourcing vs outsourcing decisions, made by grocery chains, to support their everyday production processes.
Outlined below are sample questions that may be asked. Depending on the responses to the question, new questions may emerge.
Confidentiality is assured to all informants. All results will be secured so no information can be traced to a single informant or their respective company. A voice recording of the interview will be used with permission of the informant and the two principal researchers will be the only individuals to have access to the recordings. If requested, the researchers will sign a non-disclosure agreement.

Demographics:

- How long have you been with this company?
- How long have you been in this industry?
- What are your current roles and responsibilities? Have you held other roles within this company? If yes, please provide a description of past roles.
- What are the main priorities or projects that you are working on or that the company is working towards?

Store Goals

- What are the goals of the store, both individually and companywide?
- Is your company focusing on a more **effective** supply chain which will ensure all products are in the right place at the right time or is it taking a more **cost-efficient** route, where low costs are the main priority?
- What practices do you take to either be effective or cost efficient? (*This question will be based on previous answer*)

Distribution Network

- Describe your distribution network.
- Do you use a central or regional distribution center?
- Are goods delivered through regional or central distribution centers, or just directly to the store?
- Does sourcing locally matter to your company? If so, what impact does it have on your products?

Production Processes

- What are the processes for producing items like meats, sandwiches, bakery items, fruits, etc., are they done in house or outsourced from a vendor?
    - What decisions and information went into creating and implementing these processes?
    - Has the production process of any items changed over time?
    - What are the benefits to the company process? (Either insourcing or outsourcing)
    - Is there anything that you would change about the insourcing or outsourcing decision?
    - How does the company deal with shortages and backups with these items?
- How does a company deal with keeping perishable items fresh?
    - Is there a local place from which it is sourced?
    - How are they kept fresh?
    - How does a company deal with food that has gone bad? Is there a procedure in place to limit this from happening?
    - Do customers in store value freshness? Does it affect their purchasing decisions?
    - Does the company buy in bulk? Or get shipments everyday/week/month?
    - How does a company keep items fresh while still selling everything before expiration?
    - Are premade items more cost efficient?

<u>Other</u>

- Is there anything else about your company or production processes that would be helpful to this discussion?

Appendix 2 – CITI Certification

CITI PROGRAM

Completion Date 20-Jul-2022
Expiration Date 19-Jul-2025
Record ID 50244361

This is to certify that:

Lucy Smith

Has completed the following CITI Program course:

Not valid for renewal of certification through CME.

Social & Behavioral Research - Basic/Refresher
(Curriculum Group)
Social & Behavioral Research
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

Bryant University

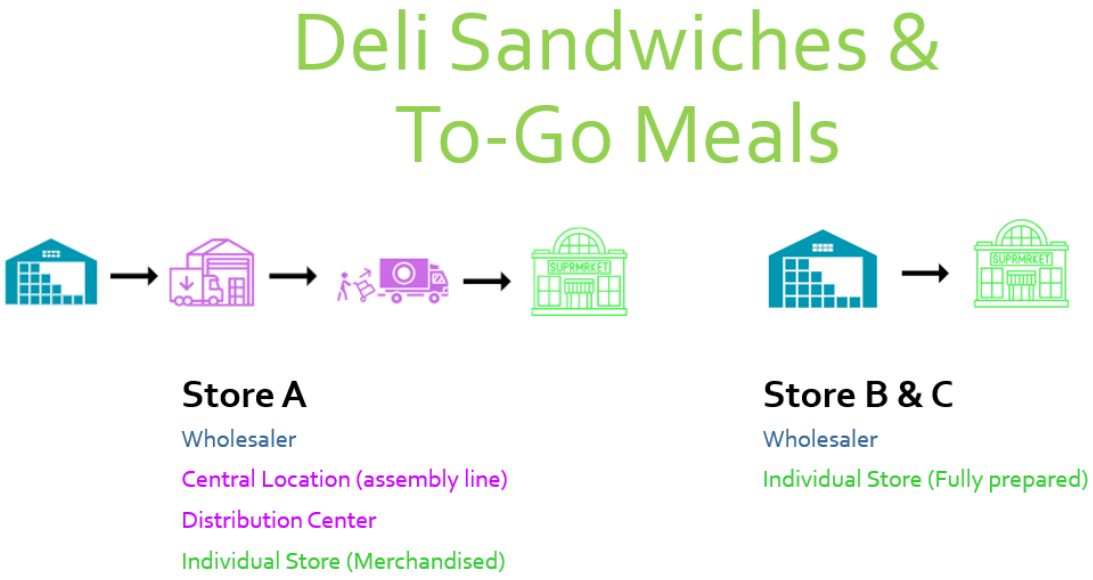
CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w39a6bff4-8257-40f8-8a4f-c9fc54b9b128-50244361

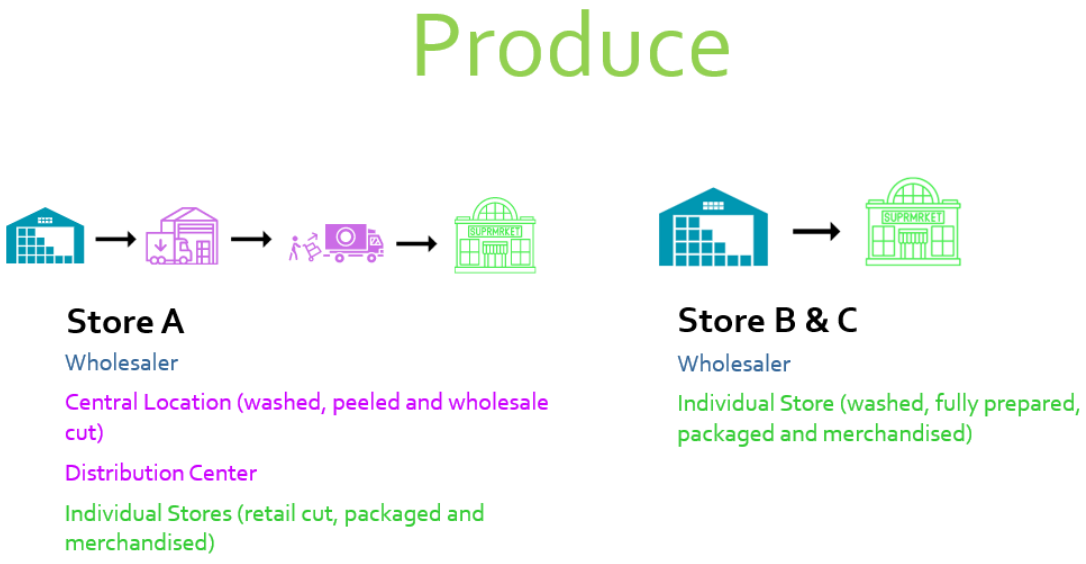
Appendix 3 - Production Process of Baked Goods

Appendix 4 - Production Process of Meat Cuts

Appendix 5 - Production Process of Deli Sandwiches and To-Go Meals



Appendix 6 - Production Process of Produce



TABLES

Table 1. Case Study Informants, Organized by Company

Company	Job Title	Length with Company
A	Senior Logistics Analyst	3 years
A	Business Support Manager l	18 years
A	Quality Specialist	4 years
A	Vice President of Retail Innovation	16 years
B	Produce Department	24 years
B	Deli Department	12 years
C	Owner	52 Years

Table 2. Grocery Store Characteristics Summary

Store	**Type**	**Number of Stores**	**Number of States Located in**	**Ownership**	**Number of Employees**	**Owned by Parent Company**
A	Large Regional	400+	5	Private	82,000	Yes
B	Small Regional	Almost 20	3	Private	3,200	Yes
C	Independent	1	1	Private	120	No

Table 3. Centralized versus Decentralized Production Process Findings for Power Perimeter Products

Production Process	**Centralized using responsive assembly cells**	**Hybrid using postponement**	**Decentralized**
When to utilize	Customers value uniformity over customization (*deli sandwiches*)	Unique and fluctuating demand patterns that require a responsive process (*meat cuts*)	Specific, customizable, on demand items without compromising shelf life (*custom cakes*)
Type of Product	**Innovative**		
Focus of Cost Reduction Efforts	Primary: Market Mediation Function Costs Secondary: Physical Function Costs, but not at the expense of market mediation function costs		
Goal	Meeting customer demand at the lowest possible cost		

Table 4. Summary of Individual Item Power Perimeter Production Process

	Production Process		
Product	**Store A**	**Store B**	**Store C**
Bakery	Option 1: Products are sent parbaked from the wholesaler, then fully baked in the individual store. Option 2: Bakery items are fully made and baked in store.	Products are sent parbaked from the wholesaler, then fully baked in the individual store.	
Produce	Products are sent from a wholesaler to the CF to be washed, peeled and retail cut. Products are then sent to the distribution center to be organized and sent out to the individual stores, where they are retail cut and merchandised.	Products are sent from the wholesaler and are washed, peeled and retail cut in individual store.	
Meat Cuts	Products are sent from the wholesaler to the Meat Packing Facility to be wholesale cut. Products are then distributed to the individual stores where they are retail cut, packaged, and merchandised.	Products are sent in wholesale cut from the wholesaler to the individual store, where they are retail cut, packaged, and merchandised.	
To-Go Meals	Individual products to be used in the to-go meals are sent from a wholesaler and assembled on a responsive assembly line in the CF, utilizing a modified cellular manufacturing process. Products are packaged and organized then sent to the distribution center to be delivered to the individual store, where they are directly merchandised.	Individual items are sent from a wholesaler to the individual store to be assembled and merchandised in house.	Option 1: Individual items are sent from a wholesaler to the individual store to be assembled and merchandised in house. Option 2: Store C will make some of the items for to-go meals in house, such as the mac and cheese or American chop suey.
Deli	Individual products to be used in the deli sandwiches are sent from a wholesaler and assembled on a responsive assembly line in the CF, utilizing a modified cellular manufacturing process. Products are packaged and organized then sent to the distribution center to be delivered to the individual store, where they are directly merchandised.	Individual items are sent from a wholesaler to the individual store to be assembled and merchandised in house.	

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