USING INFORMATION TECHNOLOGY TO IMPROVE RETAIL AND SUPPLY CHAIN OPERATIONS: A CASE STUDY OF SPARTAN STORES, INC.

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Abstract: Retail stores have used supply chain improvements in order to improve product to market speed and reduce costs of putting goods into customer hands. Optimization of the supply chain is, in today’s efficiency-driven environment, an important aspect for companies to become more competitive in the marketplace. Information technology (IT) has enabled grocery retail stores to significantly improve their supply chain and move perishables and other food items with limited shelf life. Spartan Stores (Nasdaq: SPTN) is a leading regional grocery/drugstore retailer and wholesale distributor based in Grand Rapids, Michigan. Spartan Stores, Inc. has been selected because of its unique attribute of being both a supplier to independent stores and as a retailer with its own grocery stores. In this paper, we will take a look at how the use of information technology, specifically, its CAO (computer assisted ordering) system, has enabled Spartan Stores, Inc. to improve the ordering process for its customers and suppliers.

Optimization of the supply chain is, in today’s efficiency-driven environment, an important aspect for companies to become more competitive in the marketplace. There have been many elaborations on this topic in recent research studies. Available research has allowed companies to capitalize on improvements and advances in supply chain management to improve their overall business operations. Retail stores have used supply chain improvements in order to “move product to market faster and cut the cost of moving goods from the original source to the customer” (Andel, 1997). This is especially important in a grocery retail store environment. Information technology (IT) has enabled grocery retail stores to significantly improve their supply chain and move perishables and other food items with limited shelf life. In this paper, we will see how the use of information technology has enabled Spartan Stores, Inc. to utilize improvements in the ordering process for its customers and suppliers. Spartan Stores, Inc. has been selected because of its unique attribute of being both a supplier to independent stores and as a retailer with its own grocery stores. Using Spartan Stores, Inc. as a case study will enable us to see the value provided by IT to the ordering and inventory process in its retail supply chain.

A Brief Review of Literature

Review of literature provides important directions and trends which can be useful to practitioners as well as researchers. The research done in the area of the impact of IT on supply chain

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management has been extensive. There have been many classifications and groupings done by various researchers as they considered different critical areas. Some researchers have arranged the research review by grouping it at times in four streams such as overview articles, normative studies, conceptual articles, and assessment articles (Motwani, Gunasekaran, 2000) and at other times in five streams (Gunasekaran, 2004). The groupings and classifications have largely been a matter of convenience. We will take a brief selective look at the literature and show how the published concepts apply to Spartan Stores.

Supply Chain Management uses different approaches (Simchi-Levi et al., 2004) to efficiently integrate suppliers, manufacturers, warehouses, and stores to distribute merchandise to the right locations in the right quantities and at the right time. Spartan chose to focus on enhanced role of Information Technology in order to accomplish this.

Fitzgerald noted as early as 2000 that “Many suppliers need help from their major customers in order to manage their own supply”. This is true in Spartan’s case, where major Spartan customers were their own stores, and other independent retailers, both of whom contributed to the development of the Spartan supply chain.

Kevin O’Marah (SCL, 2007) has distilled lessons from twenty five supply chain leaders, showing that the use of IT in the supply chain has now made supply chain management evolve from a low impact cost center to a means of assuring shareholder and customer satisfaction. This is true about Spartan as well, where the supply chain excels at pushing technology, supplier, and customer collaboration as an integral part of the organization.

(Supply Chain Collaboration In Retail, 2009) explains that for a retailer, the major cost is in procurement. Profits are significantly upwardly impacted by reduction in procurement costs. Therefore, Ravi Pandey (Supply Chain Collaboration InRetail, 2009) says that retail and other industries are trying “to streamline the procurement process, reduce costs, manage their spend more effectively and, ultimately, develop an enhanced collaborative platform for the whole supply chain”. IT has been recognized as a key driver in this attempt. Online procurement life cycle management, which includes all post-order purchase transactions from requisitions to invoices, significantly reduces the delivery lead time and improves supplier relationships. It offers the following key benefits to the retail and manufacturing industries: 1. Significant cost reductions through reverse auctions, 2. streamlined indirect procurement processes, 3. ability to consolidate demand across the retail chain, 4. effective spend management analysis, and 5. sourcing optimization through private exchange (Supply Chain Collaboration In Retail, 2009). All of these results and observations to apply Spartan.

Case Study

The methodology for the case study is presented in this section in a particular order. Literature review has been first presented, along with the research method. This paper has grown out of a semi-structured interview with a Computer Assisted Ordering (CAO) director; information was provided at various stages by personnel at Spartan Stores, Inc.; follow up interviews were conducted with various managers.

The company background is described in order to understand the business basis for the IT implementation. The IT implementation, along with its rationale is then discussed. An
understanding of this area will help us grasp potential problems and solutions. The various challenges, opportunities, and lessons learnt are discussed.

**Description of the Company**

Spartan Stores, Inc. is based in Grand Rapids, Michigan, (Nasdaq: SPTN). It was founded in 1918 as a cooperative of many independent food retailers. The first purchase of the cooperative was a boxcar of sugar, the savings of which were passed on to consumers. By 2000, it had begun acquiring retail stores and became a public company. Today, it is the nation’s eleventh largest grocery distributor with 1.4 million square feet of warehouse, distribution, and office space located in Grand Rapids, Michigan. The Company distributes more than 40,000 corporate and national brand products to approximately 375 independent grocer locations in Michigan, Indiana and Ohio, and to 97 corporate owned stores located in Michigan, including D&W Fresh Markets, Family Fare Supermarkets, Glen’s Markets and VG’s Food and Pharmacy. (Spartan, 2011)

Its primary focus is on being a grocer of convenience in the mid-west, and recognizes that technology can help it to be flexible in an ever-changing world of perishable and non-perishable groceries.

**Identification of the Business Need**

In the beginning, sophisticated information technology was not required as the company was small. It started growing with acquisitions and diversification after 2000, and it became clear that the earlier information system would be insufficient for the needs of a much larger company. It was deemed necessary to have a comprehensive computer-based ordering and forecasting system. Surveys and studies conducted at the time by the Grocery Manufacturers of America (GMA) showed that the average out-of-stock in a typical supermarket at 7.4%, which resulted in an annual loss of about $200,000 per store. Inadequate store ordering and forecasting was also seen as the reason for 47% of all out-of-order stocks (merchandise that has run out but not necessarily been reordered), and over half the shrink in perishables. (Spartan 2006). These studies convinced Spartan management that a better system needed to be in place to improve ordering and to improve inventory control. The company had a network of distributors, suppliers, and customers, and they needed a more integrated solution.

Spartan’s supply chain is an example of a retail supply chain. As a retailer, Spartan needs to do the following tasks well: give customers an assortment of goods to choose from, provide products in small usable sizes, and have access to inventory. They need their supply chain components to be efficiently inter-linked in order to do these tasks. Without the use of information technology, supply chain integration would not have been possible. Therefore, the IT department was tasked to program and create a system that would provide a more integrated solution to provide assistance to all involved business users of the supply chain. This was the Computer Assisted Ordering/Perpetual Inventory System (CAO/PI), pronounced humorously and known internally as “Cow Pie”.

Spartan made a decision to gradually implement CAO/PI at the corporate grocery stores. Starting on a small scale in order to test the feasibility and usage and in order to have a more
controlled review of areas of improvement, the initial project was limited to center store departments such as grocery, dairy, frozen foods, and General Merchandise/Health and Beauty products. Only warehouse supplied items (excluding direct store delivery DSD items) were considered in the pilot project, and random weight or scale items were excluded. After a year spent on the design requirements, the two store pilot project began in September 2006.

**Pilot Project and Eventual Company-Wide Roll out of CAO/PI**

A review of the pilot system indicated that computer generated orders enabled more sophisticated forecasting. After pilot implementation, less than 10% orders needed manual intervention. It reduced out-of-stock by 50%, and thus significantly increased sales and profitability. Shelf stock was optimized and this reduced inventory by 10-25%, freed up cash, reduced handling costs, and dramatically improved measurements. The software chosen for in-store management was CT2020, and it worked well. It enabled store sections to be arranged optimally with proper arrangement of SKUs (a SKU or stock keeping unit is a unique alphanumeric code used to identify a product). CAO enabled the following benefits:

- Establish inventory values in CT2020 and set minimum presentation stock, shelf capacity, aisle and shelf location, and current in store inventory.
- Accumulate daily sales - Sales for each item sold were captured and accumulated at the point-of-sale. As each item was sold, the point-of-sale (POS) data was passed to the CT2020 in-store item management system, which would then decrement the on-hand inventory.
- Daily receiving was improved. Every received shipment allowed inventory and cost to be incremented for each line-item delivered. Direct Store delivery (DSD) is used by grocery supermarkets to receive goods from suppliers directly, instead of receiving them in a warehouse. DSD shipments allowed inventory and cost to be incremented for each line-item delivered for vendor shipments as well as any other shipments.
- Inventory updates could be made in CT2020 in case of inventory adjustments, department to department transfers, store-to-store transfers, and store-to-reclamation transfers.
- Order generation was greatly improved. Demand influencers such as price, promotion, and display were integrated with sales history to create a forecast. This demand forecast was then adjusted with store inventory, pending orders, and order lead time to determine the appropriate order levels.
- Orders could be reviewed as the recommended item order was available in CT2020 for review at the store, which could be adjusted. Inventory Control is done by store employees who were able to review and act on order exceptions, as well as deal with inventory anomalies.
- Following review, orders could be submitted by schedule to Spartan suppliers and to DSD suppliers.
Figures indicating supply chain flow have been provided by Spartum Stores, Inc. (Spartum 2008)

It was found that quality of item information at Spartan improved dramatically. Item information being quite crucial in a grocery environment, this benefit became a critical motivation for expanded implementation. The historically UPC based environment was gradually moved to an SKU (stock keeping unit) based environment, which allowed like UPCs to be aligned under a single SKU. The forecasting system improved significantly as demand influencing factors could now be understood earlier. Store ads could be refined with this information. This led to the development and use of better decision-making tools that allowed
more detailed understanding and information from inventory, sales, margins, markdowns, and shrink. It also led to better metrics for measurement at all levels of the company, such as total company, banner, district, store, department, category, class, item, etc. This pilot was expanded and rolled out to other stores starting in early 2008 (Spartan, 2008).

The initial focus of the rollout was on item replenishment by CAO/PI. This was then expanded to emphasize financial perpetual inventory through centralized reporting, and merchandising and finance. Measurements of the individual item inventory impact, the in-stock position, and the presentation stock showed consistent cost savings of over 10%, on average, at most of the stores. Out-of-stocks also fell down sharply, with up to 82% reductions.

The expanded pilot was rolled out in January 2008 and tested departmental roll-out versus central all department roll-out in a single store. Based on the findings, central store roll-out started in April 2009 for the various stores, and the roll-out was completed in October 2010. A new store construction project subsequently tested the CAO and displayed similar positive results. This has been an ongoing project with incremental, evolutionary improvements on an on-going basis.

The roll out strategy was to implement CAO in a store in each district in order to build expertise. Resources and capabilities were expanded gradually until skills were developed, and then CAO was concurrently rolled out to other stores in the district.

Today, 97 corporate stores, 67 pharmacies, 25 fuel stations, and most of the 400 independent Spartan retailers use CAO. Satisfaction and efficiency has increased at all levels, and the goal to have all independent retailers use it will soon be accomplished. (Spartan, 2011)

Lessons Learned
Larry Lapide of MIT (Leading supply chain lessons, 2005) explains that “leading supply chains focus on three primary objectives--customer response, efficiency and asset utilization--when developing a cohesive distribution strategy”. Jim Miller, vice president of manufacturing operations for Cisco has also stated that the technology provider is most involved in supply chain efficiency. (Leading supply chain lessons, 2005) Spartan has found these insights to be true. Enhanced use of IT towards supply chain implementation and optimization provided substantial benefits to the company. There were some valuable lessons learned in the use of IT to enhance the Spartan supply chain.

• Getting executive commitment to this project was necessary. As per Temkins (2009), “Customer experience transformation requires strong executive commitment”. The initial plan to improve CAO was an exploratory one. The high level of commitment toward this project that was displayed by upper management enabled the involved IT personnel to be on task, and sparked behavior changes in the organization that were geared to the success of this implementation. Executive commitment allowed this plan to be rolled out successfully on a wider and more permanent basis. Regular communication among executive stakeholders and project managers was ensured through weekly project meetings, and monthly/quarterly executive meetings.
To have sustained success in CAO, it was essential to determine key metrics, define key measurements, and determine control stores, in order to measure success in a tangible manner. This was done by defining required end goals, such as: never be out of stock on any product (as far as possible), reduce inventory by 10%, and migrate to a financial perpetual inventory. Perpetual inventories required new skills, needing close work with the inventory company, and using CAO to make better decisions with product stocking. (Spartan 2011)

CAO required many operations changes, requiring changes in procedures and in ordering. The Department Manager and Scan coordinator/Assistant Store director had responsibilities to oversee system operation, run reports for department managers, and manage order exceptions. The impact on performance level of the stores was very positive because of the following:

- CAO enabled Spartan to maintain assortment integrity, with the greatest positive impact seen on grocery items.
- The CAO/PI system knows “on hand” quantities and will only order stock that is necessary. Load sizes are more consistent and more predictable.
- A process was in place to identify and account for mispicks.
- Substitution decisions were made easier as the system allowed staff to account for substitutions.
- Consumer behavior was eventually more predictable, as 80% of transactions were based on promotional items, which were ordered using sales predictors as determined by CAO and were excluded from daily inventory replenishment and sales forecasting.
- CAO/PI also exposed areas where there was too much variety and led to better inventory management and sales by a reduction in variety for some product areas.
- Perishables were identified for shrink. These are especially susceptible to waste due to limited shelf life. CAO/PI identified many areas for better shrink management. Bag salads, for example, were available in 34 varieties, and these, like many other perishables, were reduced to a more manageable number. (Spartan 2011)

New roles and responsibilities arose at various levels of the organization. At the store level, inventory specialists and inventory managers became new critical users of the CAO/PI system. At the corporate level, it led to positions such as Director of Demand Management, and Retail Inventory Specialist (Spartan 2011)

It was observed that bringing Store Operations into the project early led to better results. Giving Store Operations control over project roll-out and store training gave them “ownership” of the project, which led to more committed actions and results. For major changes, a strong store and a weak store, selected for pilot, allowed better adjustments to the project as necessary, as this accounted for a wider range of possibilities at the store level. (Spartan 2011)

Refinement of reporting metrics is an ongoing process.
Concluding Remarks

We have provided a brief look at the use of information technology in supply chain management at Spartan Stores, Inc. Spartan is both a retailer, and a supplier. An organization such as Spartan should consider every possible approach to improve customer satisfaction and to improve overall functioning of the organization while working in an integrated and efficient manner with its own suppliers, its retail stores, its employees, its products, and all its partners. Spartan has been making enhanced use of IT for computer assisted ordering to manage inventory. Information technology and its enhanced use in the supply chain has enabled Spartans progress towards accomplishing these goals in a strategic, deliberate, and consistent manner that has enabled it to stay competitive. We have shown that step-by-step and gradual implementation of a new computer-assisted ordering system and perpetual inventory system, when implemented with executive commitment and with measurable metrics, has worked for an entity such as Spartan, and a similarly careful approach should work in the case of other retailers and suppliers that are similar in their business models and business scale.

References


