RESEARCH PROJECT

ON

SUPPLY CHAIN MANGEMENT IN RETAIL FOOD INDUSTRY

FOR THE PARTIAL FULFILMENT OF THE REQUIREMENT
FOR THE AWARD OF

BACHELOR OF BUSINESS ADMINISTRATION

UNDER THE GUIDANCE OF:
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Certificate from Faculty Guide

This is to certify that the project report ***"SUPPLY CHAIN MANGEMENT IN RETAIL FOOD INDUSTRY"*** has been prepared by **Mr. Akansha Yadav** under my supervision and guidance.The project report is submitted towards the partial fulfillment of 3 year, full time Bachelor of Business Administration**.**

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Declaration

I hereby declare that the research report titled ***"SUPPLY CHAIN MANGEMENT IN RETAIL FOOD INDUSTRY"*** is the result of individual efforts and has been completed under the guidance of Prof. Ashok Kumar Sharma, GU, Gr. Noida.

The finding and interpretation in the report are based on the data collected by me and the report is not a reproduction of any other project submitted for similar purposes.

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ACKNOWLEDGEMENT

It is with the feeling of satiated and sense of Zenith that I draft this acknowledgement note. I wish to express my gratitude to those who have generously helped me to compile the Dissertation and stand up high, to the expectation of the institute.

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ABSTRACT

This *research report* had been undertaken for *the entitled* *"*SUPPLY CHAINMANAGEMENT IN RETAIL FOOD INDUSTRY ***".***

In order to gather the most appropriate and accurate data survey was conducted in various location and markets in Delhi & NCR. The data was assimilated with the help of a questionnaire aimed and designed to extract the most correct and conclusive information.

The consumers were requested to fill the questionnaire and were also asked various other relevant questions revealing detailed information apart from that in the questionnaire.

The survey was conducted successfully and its findings have been studied, analyzed and have led to a conclusion, included in the report, which could prove to be fruitful for the research report

Introduction

This study focuses on the changes occurring in the **retail food industry** and as these changes are occurring, the market is becoming more competitive. Hence in order to cope with the intense competition, changing consumer interests and lifestyles and advancement in technology it is necessary to bring some change in the operation of the retail food. Therefore, in this study supply chain management is given special focus insisting on its relevance and scope in the retail food industry. This paper shows that how IT plays a very important role in maintaining the operations of retail food chains by reducing timely and immediate flow of information, reducing logistic cost and managing the inventory.

This study has the main objective of drawing out the relevance of supply chain management in retail food industry. This paper also analyze the current status of the food industry, changes occurred and the future scope. This study has some limitations also like this study is not much applicable to Indian retail sector as 95% of the Indian retail industry is unorganized. The research design used is **exploratory research design.**

All the data collected is through websites, journals and research papers. No primary data is involved. Since there is no primary data, hence there is no sample design. Further, the retail food industry is discussed in which current scenario, factors affecting the retail food chains and changes occurring are covered. Then in the data the usage of supply chain management is discussed in the retail food industry. It is discussed that what are the changes which have occurred in retail food sector, causes of those changes (competition, change in consumer interests, advancement in technology, cost reduction etc).

As these have occurred so in order to cope up these changes, supply chain management plays a very important role. SCM focuses on reducing the logistic cost, inventory control, smooth and fast flow of information. Various softwares are used to improve the operations of the retail food chain, these are efficient consumer response (ECR), efficient foodservice response (EFR), and every day low pricing (EDLP) etc. these SCM tools are discussed in detail. It also discussed that how various retail companies (Wal-Mart, K-Mart etc) are using these SCM tools and climbed the stairs of success.

The food industry faces an increasingly competitive market with price and margin erosion. Because of increasing market consolidation, customer intimacy and responsiveness to market changes are important to gaining market share. There is increasing product proliferation with the introduction of several differentiated types of beverages and food products. In addition, companies are increasingly global in nature and serve diverse markets. Several companies are also adopting low-cost operating models including outsourced production. The companies are faced with increasing production costs with costs of energy, transportation, and raw materials rising fast. The North American, European, and Australian markets are relatively stable with low growth. The highest growth potential for the industry is in Asia and Eastern.

Critical Review of the literature

There are lots of reviews on the application of supply chain management in retail food industry. There are lots of papers which are submitted by researchers on this. A 32 page document, published by the Centre for Food Chain Research at Imperial College, examines the battle for supremacy in a food industry in which competition is played on a global field, with fewer, larger global players battling for market share. The paper begins with an analysis of the retail sector, the process of globalization and the emergence of food retailers as the dominant force in the food **supply** chain.

Another article by S A Hornibrook and A Fearne at the Department of Agricultural Sciences, Imperial College, Wye, Kent, discusses how competitive pressures, together with regulatory and industry responses to a series of food safety and quality issues during the 1980s, have impacted on contractual relationships within the UK beef industry, resulting in the development of coordinated **supply** chains between retailers, processors and farmers.

They also examine vertical sector schemes such as Farm Assured British Beef and Lamb together with horizontal schemes which link sector level schemes, such as the British Farm Standard, which have attempted to increase information.

Roger Bridger gives lots of importance to supply chain management in today's corporate world. He says that increasingly globalize and complex supply chains are the embodiment of how economic integration is turning domestic issues into global concerns. Procurement decisions and supply chains illustrate the challenges of achieving sustainability in an increasingly integrated global economy.

Intensified trade and investment, enabled by transportation and IT weave the world closer together. But as corporations extend around the globe they outsource their responsibilities along with their operations. Supply chain management (SCM) is at the forefront of the accelerating infusion of new communications technology which enables geographical fragmentation of supply chains. Far from being virtual and weightless, the manufacturing of ICT is in itself resource intensive and its current use is generally facilitating increased material intensity and throughput.

Supply chains are a becoming prominent as a focus for discourse and action on business success, sustainable development and green economics. An effective supply chain is seen as giving a competitive edge and investment in long term relationships as more efficient than spot transactions based on lowest cost. There is much talk of supply chain decisions transcending cost and revenue determinants to look to long term economic and environmental sustainability and mutual benefits beyond organizational boundaries. Ideas on the dynamics of supply chain networks include ‘coo petition', fusing co-operation and competition and moving from adversarial to win-win business relationships based on communication, collaboration and trust

The food industry is a leading proponent of SCM, yet the current situation and trends are alarming. The impacts of food supply chains are largely cumulative including production, processing, storage and distribution, making a chain perspective rather than accreditation schemes based merely on production standards especially important.

The negative impacts of lengthy transportation especially make a strong case for localization where possible. Market concentration, especially in the retail sector, has led to a highly centralized production, processing and distribution

infrastructure that circumvents localized supply systems, the opposite of the short circuit or localization of infrastructure that is needed for greater local stability. Innovative use of ICT could support localized supply networks rather than its predominant current applications such as satellite monitoring and RFID (Radio Frequency Identification) to track food as it travels longer distances. Like any management system, SCM depends on the purpose for which it is applied.

Current application of SCM technologies and practices have facilitated centralisation, vertical and horizontal integration, and corporate concentration, enabling key players, in particular multiple retailers to consolidate power within the food system.

Public sector food is widely seen as pivotal to sustainable development, with school meals described as a ‘litmus test' of sustainable development by Kevin Morgan's report to the Association for Public Service Excellence . Defra's Public Sector Food Procurement Initiative (PSFPI) supports the development of opportunities for local supply and for small suppliers, along with healthier food.

There are many inspiring examples of local sourcing and fresher, healthier food in schools and hospitals, but these initiatives are working against a strong undercurrent of aggregation of contracts, a widespread lack of supplier diversity, price pressure and increased use of processed food. Government intervention lacks a through supply chain perspective, for example one of the PSFPI objectives is ‘Better working conditions for

catering staff', but people employed upstream in growing and harvesting commodities and the multiple convoluted stages of processing, packaging and

distribution are in many cases in more precarious and exploitative employment than the often deskilled and demoralized catering staff living on little more than the minimum wage.

The imbalanced and myopically consumer oriented perception of risk in food supply chains was illustrated by the recent incidence of Sudan dyes in chilli powder products sold in the UK. Customers were assured of the effectiveness of modern supply chain visibility and trace ability of the products so any possibly contaminated items could be removed from the shelves.

Yet the contamination was not detected by the retailers, but by EU monitoring agencies and the UK Food Standards Agency. The dyes found their way into so many products it would be difficult for a consumer of processed foods to avoid them.

But the risk to UK consumers was minimal when compared to the hundreds of producers of spices including chillies dying from pesticide poisoning every year in countries like India, which received minimal media attention or industry investigation. SCM prides itself in helping to bring about a chain reversal, shifting from the production paradigm to the needs of the consumer.

Now SCM needs to become chain rather than customer oriented. Major players in the food system are adept at ‘traceability' which enables them to track contaminants and pass risks, costs and liabilities to suppliers. Policy and pressure could bring a shift from

traceability towards transparency, the disclosure of the rules, procedures and practices throughout the marketing chain from farm to plate.

Industry Profile

As the foodservice industry enters the 21st century, it is capturing more than 45 percent of the total food dollar of Americans. Restaurant sales were projected to increase 5 percent in 2000 reaching about $375 billion. By 2010, foodservice is expected to have 53 percent of the food market with sales possibly exceeding $577 billion. The table at the restaurant will continue to compete with the table at home and foodservice will continue to compete with traditional grocery stores.

With the 90's being one of the strongest and longest periods of economic growth in U.S. history, a sharp annual rise of 2.7 percent in real per-capita disposable personal income has been around 2.5 persons. One-third of all adults in the U.S. have worked in the foodservice industry at some point in their lives, with 60 percent of its workforce being female. The foodservice industry is an important part of the U.S. economy with sales making up approximately 4 percent of the U.S. Gross Domestic Product (National Restaurant Association, December 1999).

THE OPERATORS

FOODSERVICE SEGMENTS

The foodservice operators are those who own, franchise, or manage a retail foodservice business. They can operate one restaurant or a chain of eating places. The food away-from-home segment or foodservice segment (as they tend to be interchangeably used in the industry) comprises a plethora of commercial and non-commercial establishments ranging from full service restaurants to school cafeterias & prisons. The original distinction of food at home and food away from

home was based on where food is consumed and assumed that food at home came from a grocery store. Now, restaurant take-out foods are increasingly eaten at home or on- the-go and grocery stores provide ever more prepared food/foodservice types of offerings.

Thus, the classification of the source of food, as noted in Foodservice 2005, is more appropriately based on where and how food is prepared rather than on where it is eaten (McKinsey, 1996). The foodservice sector encompasses all providers of fresh prepared meals, including food sections of grocery deli. The food at-home segment refers to dry grocery, refrigerated items, frozen foods, bakery etc. that must be assembled, cooked or further processed at home before consumption.

Commercial foodservice accounts for about 90 percent of the total foodservice sector (National Restaurant Association, December, 1999). The commercial restaurant industry is divided into segments, with the largest segment, restaurants and bars, comprising 61.5 percent of total foodservice sales. The other foodservice establishments include places

involved in education, travel and leisure, healthcare, vending, business and industry, retailers, and many more.

Restaurants and bars are further segmented into limited service and full service. Limited service restaurants are divided into quick service and cafeterias, which are establishments without wait staff and that offer a limited menu of prepared food. These restaurants do not serve alcohol as a rule. Full service restaurants have a broad, full-line menu along with table, counter and/or booth service, and a wait staff. They often serve alcohol and accept credit cards.

Bars and taverns typically only serve food for lunch and dinner and target higher dollar sales with full bars and appetizers; some serve full meals. The rest of the commercial foodservice industry has a variety of other formats, such as vending machines and kiosks. In 1998, the top 100 foodservice operators in commercial foodservice had 50.7 percent of the total sales dollars, but only 33.5 percent of the total store units (The Food Institute's Food Industry Review, 2000). The percentage breakdown of the commercial and non commercial foodservice segments with their percent of total sales of $391 billion is pictured in Figure 1.

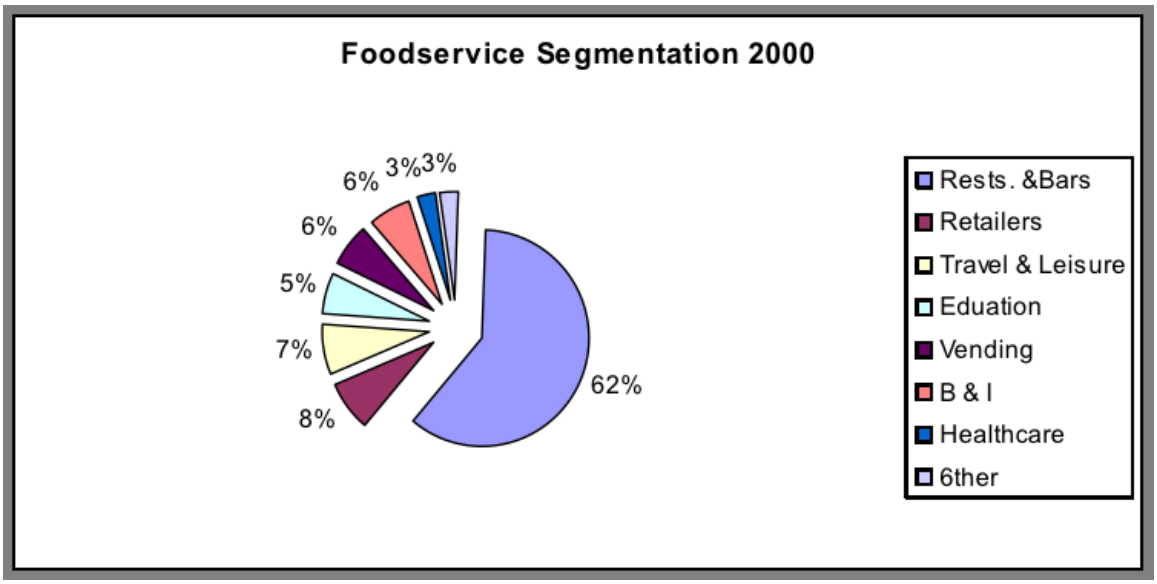


Figure - 1

Source: Technomic Inc.

QUICK SERVICE RESTAURANTS

Quick service restaurants, not only provide convenient fast service, but they are quick to adapt to the ever-changing tastes and preferences of their customers. In response to consumer demands, quick service restaurants are catering to a healthier diet, with 70 percent of fast-food chains now offering salads and many offering vegetarian options (National Restaurant Association, December 1999).

In 2001 McDonald's was the first U.S. retailer to demand that all their suppliers of hamburger provide documentation that the cattle they buy meet U.S. FDA standards for food. That is, the feed will not contain infected tissue from other animals that could cause BSE or mad cow disease (Reuters Limit. 2001). It is an example of a food retailer assuming the role of gatekeeper to protect public health as well as its own sales. Quick service restaurants' nominal sales are expected to increase by 5.1 percent in 2001. The hamburger chain operators rank first for purchases from the manufacturers in the fast food world with pizza operators second, but losing ground with only a 4.4 percent expected growth compared to 4.7 percent in hamburger chains in 2001. Specialty and other sandwich entrees are growing aggressively with 8.1 percent and 5.9 percent growth respectively forecast for 2001.

One of the biggest expanding activities of quick-service restaurants is the introduction of smaller units in establishments not historically directed towards foodservice or even food. McDonald's has alliances with several major operators such as Wal-Mart and many gas stations, where a foodservice unit is within the main part of the building where shoppers or travelers can eat.

This is also proving to be a very good concept for smaller communities that can not support a housed-alone restaurant because of overhead costs and lower volume

sales. Subway has used :his concept from the beginning with most of its establishments sharing the space and parking lot with other businesses. Competitors are even joining forces. For example, Taco Bell, Kentucky fried Chicken (KFC), and Pizza Hut (all owned by Tricon Global Enterprises), often share the same building and the same drive-thru window. The concept of 'my space' is going by the wayside.

FULL SERVICE RESTAURANTS

Full service restaurants control 28.8 percent of retail sales in the total food service industry, excluding sales of alcohol, and they have been outpacing the growth of their fast-food counterparts for the last five years. Since 1995, full-service restaurants have had total sales growth of 33 percent. Full service restaurants benefit from customers' desire for customization, personal attention, and an increasing demand for alcoholic beverages with afternoon and evening meals. Most full-service restaurants that have average checks above $8 offer some form of alcoholic beverage. Microbrews and wine service have increased tremendously in popularity over the last decade (Technomic, Inc., December 2000).

Also, the demand for take-out food has turned upscale as more consumers want the convenience of take-out, but want higher quality food with more variety than that available at a fast-food restaurant. More than 50 percent of restaurant operators with average check sizes between $8 and $25 reported that customers are ordering more take-out from their establishments than in the past. Because of this increasing demand, operators are trying to provide a convenient take-out experience for their customers. Some operators, such as Outback Steakhouse, have even formed a curb side service where the customer places an order by phone or e-mail and gives the restaurant his/her car license plate number.

When the customers drive into the parking lot, a restaurant employee brings the ordered food out to the car. This has been a very popular service and has helped increase sales in all operations offering this service. Home delivery is also growing in popularity (National Restaurant Association, December 1999).

OTHER FOODSERVICE SEGMENTS

Other segments of the foodservice industry are also looking at growth in food purchase in the future. Travel and recreation is looking at the largest jump with 5.9 percent increase expected. Retail establishments are also looking ahead to a growth of 4.9 percent with convenient store sales growing 5.6 percent in 2001. Business and industry foresees a modest 4.6 percent increase while foodservice in education and healthcare facilities is expected to be this market because profit margins are typically small and start-up costs are expensive. Barriers to entry are high for those who seek financing in the restaurant industry, so those who hope to enter must present a viable financial opportunity to potential investors. (See Appendix 6 for a list of the Top 20 Chain Restaurant Companies.)

FACTORS AFFECTING RETAIL FOOD INDUSTRY

Government Impact

The impact of the government is expected to continue to play an important role in the restaurant industry. The largest expectations seem to lead to governmental mandates for employee food safety training and certification. Hazard Analysis Critical Control Points (HACCP) may also become mandatory in restaurant operations as it is in manufacturing and processing facilities. Regulations are becoming stricter on alcohol service and taxes are expected to increase. The

government may also pass legislation mandating wage rates and increased benefits that will increase the cost of labour.

Another large policy issue that faces the foodservice industry in certain regions of the country is "tip credit." State laws vary, but wait staff usually receives a discounted wage from the Federal minimum wage and then receive the extra wages from tips. This is called tip credit. Some states however, have not adopted this practice; therefore, forcing operators to pay the full minimum wage and the wait staff also receives tips. This is an extremely sensitive topic in states that do not have the tip credit in place, especially in border areas because they have an automatic disadvantage with a higher labour cost.

- **Technology Impact**

Electronic and computer technology has been the key to many of the changes in the restaurant industry. With competition between operations intensifying, those with the

higher technology are reaping profits by being able to more effectively control costs and enhance management efficiency. Computers and software will also be invaluable tools in nutritional development and enhancement of menu items. Training of employees is changing from videos Id training manuals to computerized training software.

Managers are also becoming more computers savvy and more efficient, therefore allowing them to spend more time with employees for training and monitoring purposes and with customers for feedback. It is common to see managers checking on customers and asking them questions as they dine. This helps the manager keep up with what is really occurring in the dining area vs. what is recorded on the computer screen.

Simpler and faster point of sale data is becoming very prominent in inventory management as it allows managers to know exactly, at a click of a button, what is being sold and at what times. Therefore, they can plan daily specials and seasonal dishes that enhance the variety on the menus. As computer systems become more widely used, they can be linked to ordering operations creating a just-in-time supply system that reduces waste and spoilage and lessens the need for storage space.

The Internet and e-mail are playing increasing roles in the restaurant industry even though few customers actually place orders via e-mail. Many restaurant patrons use the Internet to find out about restaurants that they have never patronized before. E-mail is also being used to make reservations at restaurants. Several people are also on city list serves that have a weekly restaurant focus and give ratings to local establishments.

- **Consumer Demographics**

Changing consumer needs, wants, and drives foodservice trends. Innovative operators are responding to changing consumer needs by reformatting their menus and services. Now, an overall successful dining experience is key to winning the customer, not just the food, service, or location. American consumers demand convenience and want variety, quality, and consistency. The key consumer drivers

are an aging population, growing ethnic diversity, and increases in dual income families, single person households, time constraints, and a variety of attitudes correlated with different generations.

The boomers place a high emphasis on “food sophistication” with greater attention to portion attention to portion size and variety. As one ages, taste buds tend to become less sensitive, so aging generations are demanding bolder/higher impact flavours. A greater importance is also placed on healthy diet options as the boomers fight the realities of health problems that come with age.

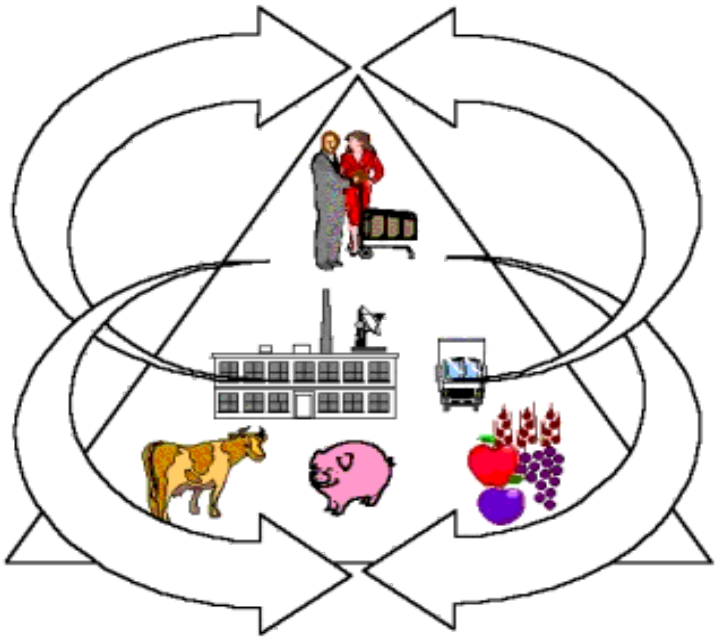
Household income is the most influential demographic factor when it comes to how much is spent on food prepared away from home. Median household income has been rising for several decades reaching $39,000 in 1998 (National Restaurant Association, December 1999). Today, close to half of all households have dual-incomes. The number of households with incomes of $50,000 or more is expected to increase 34 percent between 1995 and 2005 according to the National Restaurant Association's Conference Board NRA, December 1999).

The need for convenient meal solutions continues to increase as the number of employed 50ns, especially employed women, and continues to climb to record-breaking levels. Spending more e in the labour force, the amount of time consumers have left to prepare meals at home continues to fall Because of this, breakfast and lunch meals are often eaten on the go or during the one-hour lunch break at a business-time conscious, casual restaurant close to the office.

The lunch pail of old is now laced by a paper sack full of take-out food. Great importance is placed on speed and accuracy of vice, and consumers want it their way, right away. An increase in the number of people travelling in "fast lane" has also swelled the need for one-handed, driver friendly foods available for take-out.

Generational attitudes towards cooking are different, yet they are all amplifying the growth of foodservice. Mature consumers, born before 1946, are reaching retirement age and are happy that they not have to cook anymore and can enjoy their retirement years. The baby boomers wish that they I time to cook, but with their busy lives, they cook mostly as a hobby.

CHANGES OCCURRING IN THE RETAIL FOOD INDUSTRY



In the past, many food marketers focused nearly all their efforts on increasing volume. Firms set goals for sales growth and market share, but did not set cost objective. When they evaluated promotions, they used an incremental volume criterion instead do profitability. Distribution inefficiencies were not a major concern. That all changed during the late 1980' when sales growth became more

difficult, buyers became more price sensitive and new competitors emerged on the scene.

The food distribution system, a complex web of channels designed move food to consumers, was under enormous pressure to change and became more efficient. The food processing, distribution, and retailing sectors are in the middle of a rapid transformation focused on productivity and profitability. Researchers at the Retail Food industry Centre have examined many of these changes in the food distribution system from the retail perspective, looking forward toward the consumer and back through the system to the farm gate.

Dramatic changes are occurring in the way retail establishments deliver food to consumers, largely in response to dynamic and diverse trends in American lifestyles. Fundamental changes in demographics, labour force participation, and income distribution continue to dictate changes in the food system. The most successful food firms are organized to deliver the most desirable combination of food and service to consumers. Basic production, processing, logistics and marketing strategies in food and agribusiness companies are geared to producing goods and services that "bring the consumer back". New forms of integration and coordination between companies in various parts of the food system are based on information systems that start with the retail customer.

Understanding how this system transmits information from the retailers to suppliers and how consumers' food demand and shopping patterns are changing can help predict the future direction of the entire food system.

These recent development can be illustrated by the invasion of new abbreviations and acronyms into the food industry vocabulary. ECR, EDLP, and others, reflect the heightened interest in lowering costs while meeting consumer needs as

efficiently as possible, often with new technologies. Sales gains by discount merchandisers and by restaurants stimulated interest in improving the efficiency of the supply chain. The private label growth and new consumer interests and concerns generated additional changes.

THE CHANGING CONSUMER

There has been a sea change in the demographics and lifestyles of the American consumer. In a capsule, they include: a slower growth in population, greater ethnic diversity, an aging population, more women in the labour force, and slower growth in income and a widening disparity in its distribution.

The population growth rate which was over 1.7% per year during the post-war baby boom (1946-64) is now only about 1.0% per year. The Census Bureau projects that by 2025, Hispanics will constitute the largest minority group with 57 million, representing 17% of the population versus 10% now. Asians are the fastest growing ethnic group and their population is projected to reach 26 million by 2025. Together, African-Americans, Asians, and Hispanics will constitute over 38% of the population by 2025 versus 27% today (U.S. Dept. of Commerce, 1996).

Those age 65 and over will increase from 13% of the population today to over 18% with 62 million by 2025. Those 85 and over will double from 3.6 to 7.5 million. All these demographic changes imply that total food sales will not grow very much, a greater variety of ethnic foods will be consumed, and the elderly will increase demand for healthy, nutritious food.

The fastest growing segment of the restaurant business has been fast food, and drive-through sales have been a major factor. Their sales doubled between 1984

and 1994 capturing 52% of all restaurant sales (Price, 1995). More generally, consumers now spend almost one-half (47%) of their total food dollars for the 37% of their food (by

volume) that is consumed away from home (Food Institute, 1996b, p. 7; Manchester & Clauson, 1995). Clearly the value of time for many consumers is higher than the extra costs of purchasing food ready to eat. In terms of the theory of household economics, wage rates exceed marginal productivity of household production (of food).

Take-out food combines value-added services (cooking) with freshness, variety, and the comfort of eating in your own home. It is obtained from a variety of types of restaurants, delicatessen shops and grocery stores. The Food Marketing Institute (FMI) reports that shoppers buy 48% of their prepared take-out food at fast food places, 25% at other types of restaurants, and only 12% at supermarkets (Food Institute, 1996a).

Food shoppers can be roughly divided into two broad groups: those with lower incomes who are "economizers or price conscious" and the "convenience-oriented" who are looking for ways to save time. FMI puts the size of the two groups at about 45% and 55% of the market, respectively (Sansolo, 1996) [See Figure 1]. Although we spend only 11.4% of personal disposable income on food and the average household spent 14.2% of its income on food in 1994, the budget share was much higher for lower-income households.

ures as a percent of household income after taxes were 34.8% for those with incomes of $5,000-$9,999; 24.2% for $10,000-14,999; 21.0% for $15,000-19,999; and

17.3% for $20,000-29,999 but only 8.5% for those with incomes of $70,000 and over in 1993 (Putnam and Allshouse, 1996) [See Figure 2].

The "convenience-oriented" group contains many families with dual-income earners, in which both the husband and have professional positions. Characteristics of those who report time being a tighter constraint on their decisions than money include being age 35 to 49, married, white, earning over $50,000 per year, having a professional or white collar job, and staying home most Saturday nights (Crossen and Graham, 1996). Some 51% of households with incomes less than $15,000 report looking in newspapers for grocery specials "Pretty much every time they shop" versus only 30% with incomes over $50,000 per years. Likewise, 39% buy store or lower-price brands and 9% shop at

discount or warehouse stores for grocery items compared to 16% and 5% respectively, in the higher-income group.

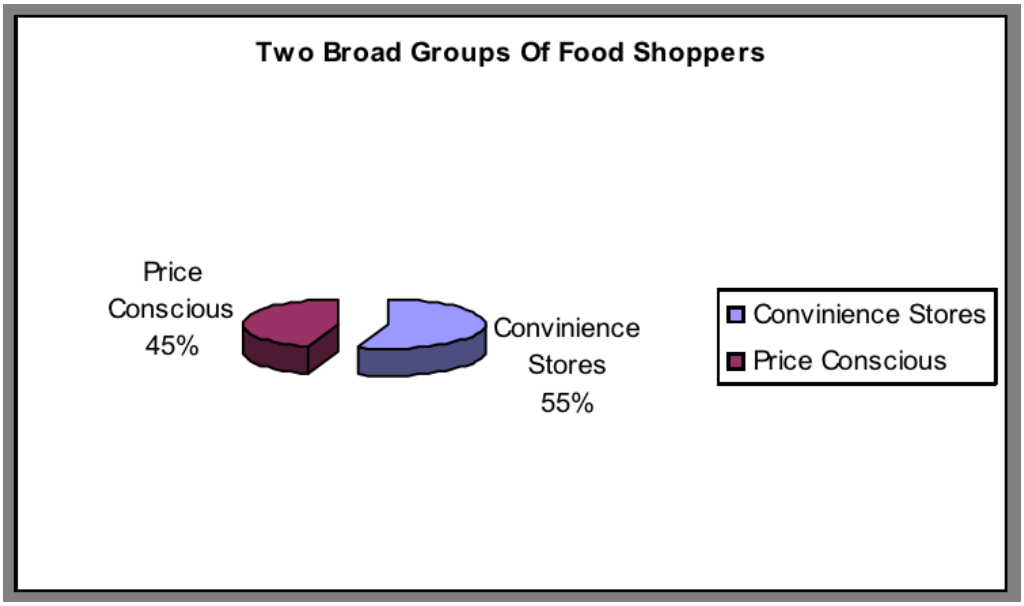


Figure – 2 ,

Source: Technomic Inc.

Integrated Logistics Services for Food

Increase Efficiency and Ensure Compliance in an Evolving IndustryHow do you deal with special handling needs, emerging compliance regulations and increasing globalization—and still safely control the movement of goods through your supply chain?

Whether you are a manufacturer, distributor, wholesaler or retailer in the food industry, our Integrated Planning Solutions and Integrated Logistics Solutions will give you greater access to the up-to-the-minute information you need to be successful. You'll have the flexibility to respond in real time to ever-changing demands and achieve higher throughput in a shorter timeframe. You can reduce inventory, improve service levels and lower costs. And you can ensure compliance with the food industry's evolving regulations.

Benefits

- Balances supply and demand
- Improves supply chain visibility
- Provides inbound freight management
- Enables catch weight entry
- Increases throughput while maintaining inventory and order accuracy
- Reduces distribution errors
- Offers date/lot tracking and rotation
- Optimizes facilities and labour resources
- Enables compliance with industry standards
- Includes RFID functionality
- Provides transportation procurement, planning and execution

- Offers multi-echelon inventory optimization

FOOD RETAILING CHANGES

Traditional supermarkets are facing serious new competitive challenges from supercenters at the price-conscious end of the market and from "home meal replacement" providers at the convenience-oriented end. Supercenters with an average size of about 150,000 sq. ft. devote about 40% of their space to grocery items and the rest to discount general merchandise. Supercenters accounted for only 2.0% of all groceries by commodity volume in 1994, but that is projected to grow to 7.4% by 1999. There were 380 supercenters operating in 1994 with a projection of 1,200 by 1999 (Food Institute, 1996b, p. 125).

The major supercenter operators are Wal-Mart, K-mart, Fred Meyer, and Meijer Stores. Traditional supermarkets are very concerned about the level of efficiency and, hence, price competition supercenters bring to the grocery business. A major motivation behind the "efficient consumer response" (ECR) initiative is to get ready to compete with these new competitors, especially Wal-Mart. The average grocery retailer has operating expenses equal to 21.8% of sales, whereas Wal-Mart's operating costs are only 17.5%. Even after full implementation of ECR, operating costs for the average grocery retailer are estimated to be 19.3% (Blattberg, 1996).

Traditional grocery sales are stagnant. Even though sales rose 1 % in real terms in 1994, real per capita spending on food in grocery stores fell over 4% while per capita spending on food away from home rose over 3%. On the brighter side, food service sales in grocery stores are growing at 2% per year in real terms and are expected to reach $5 billion in 1996, a 4.5% increase from 1995 (Hammonds, 1996; and Love, 1996). Although growing rapidly in response to the demand for

convenience, the market for prepared take-out food has many competitors. One of the fastest growing is "Boston Market," which is built specifically on the concept of providing consumers "a home replacement meal" at a reasonable price. As of May 1996, Boston Market had 898 stores out of the 3000 they plan to build in four years.

Selling Convenience

The concept of convenience is to save consumers time. Reducing the preparation required prior to actually consuming a product is one form of convenience. In this vein, sales of pre-washed, pre-cut produce, such as carrots and celery, and ready-to-eat packaged salads have grown rapidly (about 15% per year in a typical supermarket). Most consumers are certainly aware they are paying more, but obviously they are willing to pay for the value-added in terms of increased convenience.

There are at least two other dimensions to convenience from the food shopper's perspective. One relates to the number of tasks that can be accomplished during a single shopping trip or in a single store and the other relates to the ease of shopping and time required to shop. To improve their one-stop shopping appeal, supermarkets have been adding new services, such as banks, florists, video rental, and pharmacies even though the proportion of shoppers who use these specialty departments remains small. Only 13%

make a purchase from in-store pharmacies and only 4% make a floral purchase (FMI, 1991).

To make it easier and quicker to shop, supermarkets are **changing their interior designs or floor layouts.** A model of the traditional and new grocery store layouts are on Figure 3 and Figure 4. Newly designed or remodelled stores are expanding their prepared foods/deli into a "food court" with perhaps even a sit-down-to-eat area. The customer is able to walk directly to the departments like dairy, deli and produce without walking through all the dry and canned goods. This will help them compete with convenience stores. Supermarkets are also trying to improve their overall ambience with amenities like fireplaces, carpeting, and entertainment for children.

The ultimate convenience is home shopping in which consumers give their order by phone, fax, or even using their home computer after looking at a catalos or visiting a web-site. Peapod Inc. is a home shopping service initially operating in Chicago and San Francisco in which the customer can browse "electronic aisles." Peapod employees then go to designated supermarkets to fill orders (Food Institute, 1995, p. 186). Twenty-four percent of stores offer home delivery and 3% of customers currently use it (Food Retailing Review, 1996).

Efficiencies

Food retailers are now moving towards realizing the full potential of point- of-sale scanner data. Even though the food industry was the first to use electronic scanning of price and product at the point of sale, they lagged other retail sectors in adopting it to streamline the entire distribution system. Now, instead of just using scanners to speedup checkout and verify prices, the goal is to automate reordering (continuous replenishment) and eliminate excess inventory and excess variety.

A seamless flow of data back to vendors and food manufacturers and a paperless payment system would save billions of dollars in transaction costs that are

currently incurred. For example, "pay on scanning," would allow the retailer to pay the vender electronically when a consumer purchases the product and it is scanned. This would eliminate the cumbersome task of invoicing shipments at the backdoor and, of course, reduces the costs of inventory to the retailer. Moreover, electronically sharing information between trading partners as part of ECR will increase efficiency and, potentially, consumer satisfaction.

Scanning, available now in over 97% of supermarkets, facilitates a variety of customer loyalty programs. An estimated 20% .of supermarket chains and 13% of independents have electronic frequent shopper or loyalty programs *(Minnesota Grocer,* Spring 1996). Frequent shopper programs can thus be the basis for sophisticated database marketing which targets products to consumers based on their purchase patterns and demographic characteristics. Although there may be both privacy and equity issues associated with this type of competitive marketing, there has been little objection from consumers.

Swot Analysis

Strengths

- By 2010, foodservice is expected to have 53 percent of the food market with sales exceeding $577 billion. This shows that foodservice industry has high future scope and investment in this sector is beneficial.

- Changes occurring in the retail food industry in the form of change in retail formats like emergence of more supermarkets, hypermarkets, direct home delivery etc giving modification to this sector.

- Asia and Central & Eastern Europe are continuing to redefine the world economy. The retail sector is evolving fast in these regions as the middle classes expand and national and international operators invest in stores and supply chains.

Weaknesses

- Asian convenience retailing will have to exhibit a number of characteristics, including customer focus, a strong retail concept, scale, supply chain expertise and well-trained, motivated staff for strong growth of the market.

Opportunities

- Convenience stores gained share in most of the East-Asian markets. From a retail perspective, the continent has areas of opportunity in the south, which is becoming increasingly attractive, as southeast is gradually losing its allure due to higher saturation rate.

- Still this region is growing faster than rest of the world with most countries showing nearly 10% growths in c-store market in 2004. China, India, Turkey,

Vietnam, Russia, Romania and Bulgaria, offer the strongest investment opportunities for retail and consumer companies.

Threats

- The shifts in the world economy are not just geographical but societal: technology and information have changed everyday relationships, with consumers dictating increasingly what they spend on which products and how. Hence, convenience has become the key to retail industry. This is driving the latent demand or potential industry earning for the convenience store industry.

Research Methodology

RESEARCH OBJECTIVE

The study has following objectives:

- Studying the current scenario of the food industry, its overall share, growth
  rate etc.

- A brief on the retail food industry, the factors influencing the industry and the changes occurred as compared to the old period.

- Study on the supply chain management, its application in retail food industry by usage of various softwares.

- Throwing light on how the retail companies like Wal-Mart, K-Mart etc are successfully using the supply chain management tools and earning high profits.

RESEARCH DESIGN

The research is on the scope of supply chain management in retail food industry.

This research is **secondary database oriented**. Hence the research design used is empirical research. The data is collected through websites, various reviews, and journals.

SCOPE OF THE STUDY

This study shows the relevance of supply chain management in retail food industry.

This study has following scope:

- The study discusses the current foodservice structure and shows its comparison with the old foodservice structure. The changes which have

occurred in the foodservice structure with respect to changing lifestyles of the consumers, increase in competition, economical changes etc.

- ❖ The study further analysis the importance of supply chain management in today's corporate world and how does it applies to the retail food industry for increasing its efficiency.

- ❖ The study further discusses the various softwares used by the companies manage its retail chain in food which enhance its logistics, information supply, inventory management etc

Company Focus

For the study, searched many companies and finally focused some companies such that **Reliance Fresh, National Handloom, Sankalp Restaurant, Mc Donald, Pizza Hut, Dominos Hut, Barista, Niros etc.**

Types of Research

1. Descriptive Research

This research is the most commonly used and the basic reason for carrying out descriptive research is to identify the cause of something that is happening.

2. Exploratory Research

This genre of research simply allows the marketer to gain a greater understanding of something that s/he doesn't know enough about.

Data - Findings and Analysis

Distribution

The foodservice industry's supply chain is complex and diverse. In 1997, linking the approximately 740,000 operator locations to the manufacturers' are more than 3000 distributors who supply both food & non food items. The business has been consolidating rapidly and in 2000, the number of operator units totalled over 800,000, yet the number of distributors had shrunk to only 2,675. A brief sketch of the foodservice supply chain is given in Figure 6. Approximately 85 percent of manufacturers' products ($98.6 billion worth in 1997), are sold through brokers/distributors and the rest ($14.4 billion in 1997) is sold either directly to foodservice operators or through warehouse clubs.

All distributors together sell about $116.8 billion worth of products to foodservice operators, adding $18.2 billion in value to the products they have purchased from manufacturers. The retail sales at foodservice places totalled $309 billion. The distribution chain adds value of 173 percent after the food leaves the manufacturer.

Distributor’s playa major role in supplying both food and non-food items to foodservice operators. The following definition of foodservice distributors attests to the diversity of retail foodservice operators that the distributors cater to.

"Foodservice distribution involves the wholesale supply of food and related products to retail meal

providers, including restaurants, hospitals, schools, and hotels. These distributors also serve convenience stores, cruise ships, the military, and other purveyors of prepared foods, both commercial and not-for-profit" (Credit Suisse First Boston, 1999). Even though about 85 percent of the manufacturers' products are sold to retail outlets through distributors, Table 2 shows that retail foodservice operators typically deal with a multitude of distributors.

Type of Foodservice	**From how many distributors**		**Percent of food dollars spent**	
Retail Operation	***Do you purchase food?***		***With primary: distributor***	
	2000	**1999**	**2000**	**1999**
Limited-menu Restaurants	4	3	65	74
Full-menu Restaurants	5	5	63	62
White Tablecloth Restaurants	7	5	52	55
Hotels/Motels	5	7	70	66
Hospitals	6	6	79	82
Nursing Homes	4	5	72	74
School Foodservice	8	6	51	64
Colleges/Universities	7	7	70	72

Annual Dollar Sales				
Less than $200,000	5	3	79	78
$200,000 - $299,999	3	5	71	63
$300,000 - $499,999	6	4	57	74
$500,000- $999,999	4	5	63	68
$1,000,000 - $1,999,999	5	6	67	64
More than $2,000,000	7	7	62	69

Table 1: Foodservice Operators Purchase from Many Sources

Food Institute Report May 22, 2000

Distributors may be grouped into local, regional, national, and systems distributors (Figure 6). The local and national categories include broad line and specialty distributors along with warehouse clubs or cash-and-carry operations. Regional distributors are primarily broad line, and a few May also run warehouse clubs or cash-and-carry operations. System distributors include chain/multi-unit specialists and in house distributors (Technomic Inc., December 2000).

In 2000, according to Technomic, the US foodservice distribution market generated sales Df about $163 billion among approximately 2800 companies whose primary business is delivering to foodservice. (This is an update of the $116.8 billion estimated in 1997 credit Suisse First Boston (CSFB) estimates that at an annual growth rate of 3

percent they will approach $180 billion in sales by 2005. There is a consolidation in the industry as indicated by he fact that though the market grew at approximately 4 percent between 1993 and 1998 from $12O billion to $147 billion, the number of distributors fell at approximately the same rate from 1,350 to 2,675 (CSFB,1999; Technomic, 2001).

Total $163 Billion

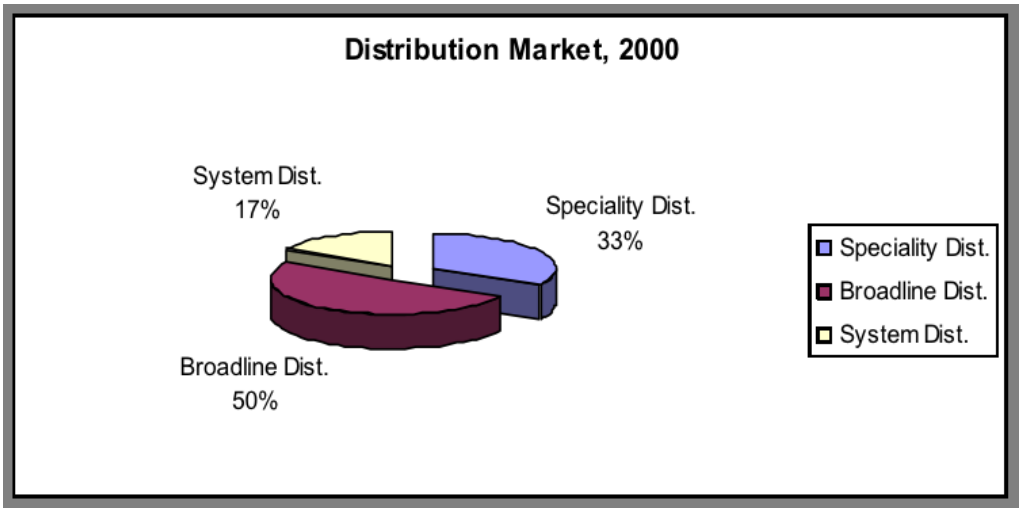


Figure - 3

Source: Technomic Inc.

Broad liners

Broad line distributors serve the needs of a diverse customer base, consisting largely of single unit operators and small chains. A typical broad liner can have between 2000-4000 customers. They attempt to offer one-stop shopping by carrying an array of food, equipment, and supplies. They carry upwards of 10,000 stock keeping units (SKUs) and deliver value pricing by leveraging economies of scale. They negotiate pricing with independent operators while often using cost-plus pricing with large chains.

With 2000 sales of $82 billion, they comprise almost 50 percent of the market. The top six broad line distributors based on 2000 sales, as estimated by Technomic, are given in Table 3. The compound annual growth rate (CAGR) is impressive over the last five years, with the top 3, namely Sysco, Alliant and U.S. Foodservice driving broad line hare growth.

System Distributors

System distributors target specific multiunit customer channels. They have evolved to serve large chains by emphasizing efficiency, centralized service, low-cost, and no frills with highly reliable product movement. They may also focus on segments such as convenience stores, hospitals, and hotels. They normally have limited inventory carrying 500-1000 SKUs and have lower overheads. With the chains, they normally use cost-plus pricing. These lists the leading systems distributors in the foodservice supply chain. The four at the bottom of the table are chain owned distribution systems. The primary

differences in the business models of the generalists (broad liners) versus the system specialists can be found in Tables.

The lower margins that system distributors operate under is offset by their larger asset turnover & lower overheads. CSFB Research analysis shows that the top broad line distributors and system distributors have similar profitability. However, they believe that in the long run, the broad line model may be less risky as it is not dependent on the vagaries of a single or few large customers. Also, broad liners can add greater value through their proprietary products and services.

Specialty Distributors

Specialty distributors may focus on a product (meat, diary, equipment) or a segment (vending, airlines) or they may be warehouse clubs or cash-and-carry operators. They (especially the product specialist) often adopt a quality positioning and flourish in niches that require uncommon knowledge in product sourcing, handling, or service.

All three types of distributions, viz. broad line, system, and specialist, may belong to buying groups which offer members, who typically are small/medium size distributors, buying clout. Additional benefits such as private labels, merchandising and marketing programs, and other support services may also be provided by these buying groups. Table 7 lists some of the leading buying groups of foodservice distributors.

Almost 65-70 percent of a distributor's margin now comes from "trade dollars" (extra incentives paid by manufacturers to distributors to promote their products).

This also favours the largest distributors who have bargaining power and can negotiate more favourable terms with the manufacturers.

The increased complexity and specialized nature of the distribution business will favours the large broad line distributors who can take advantage of economies of scale, national penetration, proprietary brands, information technology, and logistics excellence. The recent rend towards growth through mergers, and acquisition is expected to continue. The success of industry wide initiatives to increase efficiency in the supply chain such as Efficient Food response will hinge on the support of the large distributors.

The food system has shifted 180 degrees from being producer-driven to being consumer-driven. The power in the system is at the retail end because retailers receive the information about consumers' preferences first. This information gives them power to compete with other retailers, to negotiate with vendors and to respond to consumers. This information, which is reluctantly shared, will be transmitted directly to food manufacturers and other vendors in an efficient consumer response system. This induces at least two other fundamental changes in the food system. It builds stronger alliances between retailers and vendors who have traditionally been adversaries. It also changes the objective function for firms up and down the food chain from that of maximizing revenue to maximizing return on assets (profits).

Traditionally, supply was pushed through the system from farmer to processor to wholesaler using volume discounts to push product to the next stop down the food chain. Some vendors even paid stores to put their products on the shelf leading to a phenomenon of "making more money by buying product than by selling it." When

inflation was relatively high, wholesalers and retailers could make money by holding large inventories of several products, buying low and selling high. In the end, consumers were sometimes offered coupons or price cuts to move the product out of the store.

Increasingly the system is being designed to respond to consumer demand as quickly as possible. Inventories are getting leaner, and distribution costs are declining. New products that most directly respond to the wants and needs of consumers are the most successful. Nabisco Snack Wells, a line of cookies and crackers which combines reduced fat and good taste, has been one of the most successful products introduced in the last several years. Reformulating recipes and packaging to respond to consumers' preferences for specific food characteristics will be faster and more precise

Overall, the entire food system is in a very dynamic period. In large part, the changes are being driven by fundamental shifts in consumer wants and needs, by the availability of information technology and, by a quest for profits over volume. Macroeconomic and social forces that coincide with these changes are lower inflation, slower population growth, wider income distribution and sharper ethnic and philosophical distinctions. Signals received at the retail end of the food chain work their way back downstream and determine the products produced and manufactured throughout the food system.

The food supply chain moves food from the farm gate to the consumer, transforming raw commodities into products that can be conveniently purchased, prepared, and consumed. This chain is comprised of food procurement, and manufacturing companies, food wholesale and distribution firms, brokers, food

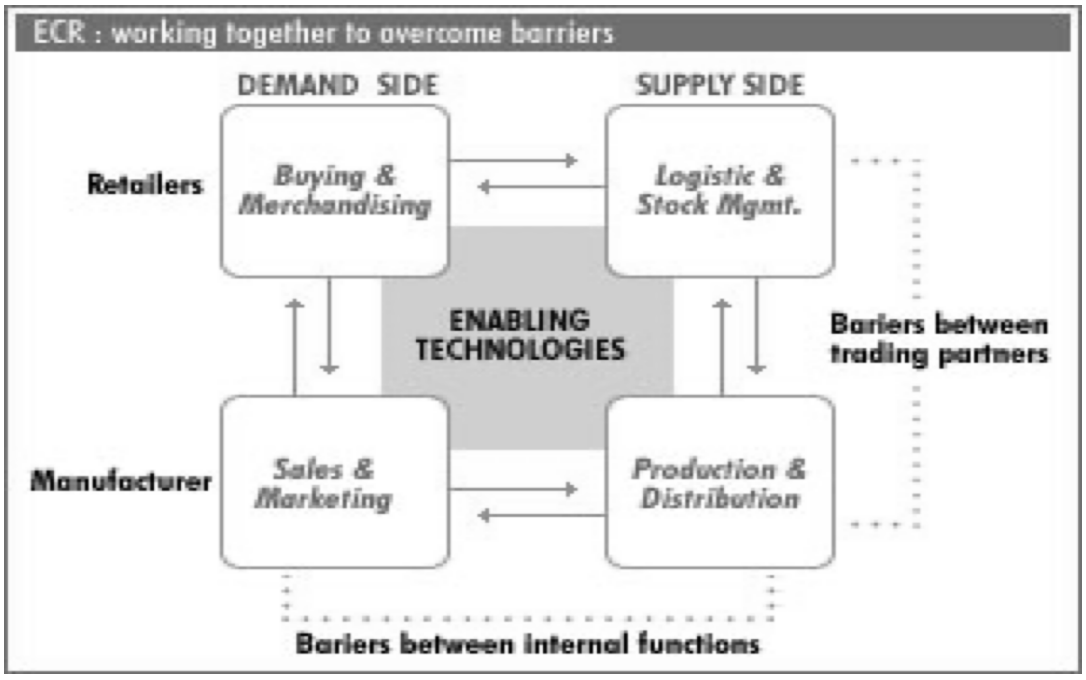
service firms and restaurants, and retail grocery firms. It is remarkable for its efficiency, diversity of firm sizes and types, and responsiveness to consumers.

"Reengineering" is the radical redesign and restructuring of business processes (Hammer). In place of incremental adjustments to changing conditions and opportunities, it calls for a rethinking of business activities, information flows, and organizational forms from a whole systems perspective.

Reengineering is evident throughout the food supply chain and the broader food system. Perhaps the most comprehensive reengineering effort, however, is the grocery industry's Efficient Consumer Response (ECR) initiative. This industry-wide, collaborative effort is bringing together food manufacturers, distributors, brokers, and retailers. The aim is to increase both intra- and inter firm efficiency through new forms of cooperation and coordination that are often based on applications of information technology.

THE ECR INITIATIVE

Recognizing new opportunities for cost savings and improved service to customers and challenged by new competitors, firms throughout the grocery industry have responded with the ECR initiative. First articulated early in 1993 in a report prepared by Kurt Salmon Associates, Inc. (KSA), the vision for ECR is a system characterized by "timely, accurate, paperless information flow" and "smooth, continual product flow matched to consumption" (KSA, p. 1). Participation by individual firms and a wide range of industry trade associations is coordinated under the Joint Industry Project on Efficient Consumer Response.



Value chain analysis (porter, pp. 33-61) is a fundamental concept in the ECR initiative. A value chain represents the internal structure of a business. The elements of a generic value chain include primary activities -- inbound logistics, operations, outbound logistics, marketing and sales, and service -- and support activities -- procurement, technology development, human resource management, and firm infrastructure activities such as accounting and general management. The individual firms in an industry are part of a value system that is made up of separate but interlinked value chains.

One way firms can gain competitive advantage is by redesigning elements of their own value chain. They can also gain competitive advantage by redesigning linkages to the value chains of their trading partners. In both cases, costs can be reduced and/or better services can be provided through improved coordination achieved by sharing information or realigning incentives, through redesign of

linked activities so they mesh more effectively, or through reconfiguration of activities to eliminate some linkages altogether.

The ECR initiative focuses on reengineering activities and linkages in four fundamental processes that run through the entire food supply chain: **selection of product assortments, product replenishment, product promotions, and new product introductions. Only through system-wide changes can potential gains in these areas be fully realized**. Cooperation across the system has been possible because, at least in principle, these gains should be large enough to leave all participants in the system at least as well off as they were before the changes. In the remainder of this section, ECR strategies for each of these four processes are described. In these descriptions, particular emphasis is placed on the organizational mechanisms being used to reengineer intra- and inter firm linkages.

Product Assortment: Making the right products available to consumers and merchandising them effectively is the focus of ECR efforts directed toward efficient product assortment. Retail stores make product assortment decisions to best use their limited selling space. Moving back through the food supply chain, efficient assortment at the store level can induce more effective use of distribution center space and send better signals to manufacturers, allowing them to produce a mix of products and package sizes that matches consumer demand.

Category management is the central element in the ECR strategy for efficient product assortment. The **Category Management Report** prepared by the Category Management Subcommittee of the ECR Best Practices Operating Committee and the Partnering Group, Inc. is an excellent overview of category management practices. Under category management, individual items are grouped into a category defined on the basis of consumer needs and perceptions. A category will

include related products from multiple suppliers. In some cases -- pizza, for example -- those products may be sold in several departments within the store. Ideally, procurement, marketing, and merchandising for a category are coordinated under a single strategy that is tailored for the store's customer base.

This is a complex task that requires not only merchandising skills and an understanding of local customers, conditions, and buying patterns, but also data on broader market trends, knowledge of interrelationships among demands for complementary and competing products, and an understanding of psychological research on consumer behaviour. The skills, knowledge, and data required for category management are distributed across the food supply chain but do not come together in any single segment. Therefore, category management is possible only with cooperative arrangements that cross firm boundaries. These partnerships can take several forms.

For products that move through the wholesaler supplied and self-distributing retailer channels, category management relationships are often cantered at the wholesaler or retailer corporate headquarters level. Looking upstream, a category manager will establish a partnership with a counterpart working for a single key supplier. This bilateral relationship gives the distributor/retailer access to industry level expertise and information that resides with the supplier.

It gives the supplier access to store level data for its own and competing products and opportunities to be participate in store level marketing and merchandising experiments. Together, the partners develop a general strategy for the entire category -including products supplied by the supplier-partner's competitors. Looking downstream, the distributor/retailer category manager works directly with

store managers or through corporate retail consultants to fume tune the product assortment and shelf space allocation strategies at the store level.

For products that move through the DSD channel, a relationship at the corporate level may be replaced or supplemented by a partnership between an individual store and a local category manager working for a supplier. The DSD vendor category manager, who is often supported by corporate category management specialists, uses store level data to customize the product assortment and shelf set for the entire category, including products from competing suppliers. Again, parties in the partnership gain access to data, knowledge, and opportunities for direct interaction with customers that would not otherwise be available to them.

These relationships share several noteworthy features. First, the distributor or retailer establishes a partnership with a single key supplier -- not with all suppliers. Second, the partnerships allow data, expertise, and effort to flow across firm boundaries without direct monetary payments. Finally, within and across organizations, performance is measured by "scorecards" which stress profitability measures that will lead to win-win results and will penalize a party that acts only in its own self interest. As such, a category management partnership creates an intra firm-like context for an inter firm relationship.

Product Replenishment: Efficient replenishment strategies promote faster, less costly movement of products through the supply chain, while reducing product inventories throughout the system. Efficiencies can be achieved by improving physical distribution systems. They can also be realized through faster, more accurate transmission of orders, billing, and product information. Finally, better use of data and information that is distributed through the system can also be an important source of efficiency gains.

Improvements in the physical distribution system are being made through intra firm reengineering of warehouse and logistics operations and through the redesign of processes that link separate firms. Supervalu's new regional distribution centre in Anniston, Alabama, is an example of internal reengineering (Mathews). Slower moving, high value food and non-food items flow through this state-of-the-art facility to downstream distribution centres. Complete pallets of some products are cross-docked to downstream distribution centres.

Also, new product picking technologies facilitate assembly of mixed pallets for store level orders that can be cross-docked onto store-bound trucks at the downstream distribution facilities. Inter firm reengineering efforts in logistics and distribution are exemplified by warehouse picking systems that support assembly of mixed pallets with items arranged to minimize labour required for store shelf restocking (Holistic Work Group of the ECR Best Practices Subcommittee and CSC, p. 53). Such systems requiring sharing of store layout information and are less costly to implement when store layouts are standardized.

Improvements in the flow of orders, billing, and product information are being based on increased use of Uniform Communication Standard (DCS) transactions sets for EDI. EDI allows instantaneous, paperless transmission of data within and between firms. Because transactions are standardized, data can be readily transferred into internal information systems, even when those systems differ across firms. Potential cost savings and system- wide efficiency gains from EDI are substantial, but so are the costs of implementation. Considerable progress has been made in the shift to EDI, but benefits can only be fully realized when adoption is universal.

Better use of firm level data on item movement and inventory levels is one way to increase efficiency in the replenishment process through more effective use of information resources. Computer Assisted Ordering (CAO) has long been used in warehouse operations to generate orders based on current inventory, movement projections, and optimal reorder points and order sizes. Efforts are being made to implement CAO systems at the retail store level. This will require greater accuracy of the scanner data required to maintain perpetual inventories and changes in firm cultures that value the judgment and expertise of order writers who base decisions on visual inspection of shelf stocks.

ontinuous Replenishment Practices (CRP) are a still more sophisticated approach to using data more effectively. Under CRP, the customer (a warehouse *or* retail store) shares data on item movement and inventory with the supplier (a manufacturer *or* warehouse). The supplier uses this information to write orders for the customer in a way that minimizes replenishment costs subject to maintenance of an acceptable service level for the customer. For example, under a CRP relationship between a manufacturer and a wholesale distribution centre, an order may be adjusted to reflect the manufacturer's production *or* delivery schedule. Alternatively, the manufacturer may adjust production *or* shipment schedules in order to more effectively meet the needs of the distribution centre. CRP systems require accurate data, EDI capabilities, accounting systems that permit sharing of reliable performance data, and trust between trading partners.

Three institutional design strategies are being used to foster development and adoption of efficient replenishment practices. The first is standardization. This is particularly evident in the move toward EDI, where the UCS transaction sets establish standard interfaces between non-standard information systems in separate firms. Not only does this make it easier for firms to exchange data electronically,

but it also provides standardized information on information system requirements that makes it easier for information system developers to serve the industry. Best management practices and performance benchmarks for efficient replenishment are another example of standards. In both cases, standardization makes it easier for firms of diverse sizes and types to coexist in the industry.

The second strategy is the use of markets for "unbundled" products and services to create strong financial incentives for firms to internalize positive and negative externalities they impose on their trading partners. Unbundling is the basis for the accounting systems that support benefit sharing under CRP systems. It is also being used to encourage the adoption of EDI and best practices for physical distribution. For example, both Supervalu and Fleming are shifting to service-based costing for their customers. They will charge more to customers that are more expensive to serve because they do not place orders electronically or do not adjust daily order levels to minimize fluctuations in the cubic feet of truck space required for each shipment.

The third strategy is the transfer of decision authority across firm lines. In effect, decisions are "outsourced" to a trading partner that is in a better position to internalize externalities. This is the motivating factor for CRP strategies. Tmnsfer of decision authority also occurs in category management partnerships, especially for DSD products.

Product Promotions: Promotional activities include advertising, consumer promotions in the form of coupons and price reductions, and trade promotions in the form of discounts and allowances. While promotions are a valuable competitive tool, their use can also reduce operational efficiency in the food supply

chain. The primary aim of efficient promotion strategies is to eliminate as many of the adverse effects of promotions as possible.

The use of trade promotions increased dramatically during the 1980's (KSA, p. 79). This had its roots in the 1970's, when buying on deal became a standard practice. The common practice is for manufacturers to set artificially high standard list prices for their products, then periodically offer large discounts or promotional allowances. As Thomas, Staatz, and Pierson explain, this makes sense in an environment with high inflation that lowers the real cost of holding inventories and manufacturing technologies that are operated most efficiently by making large runs of individual items in order to minimize setup costs. It makes little sense, however, in the current environment with low inflation and flexible manufacturing technology.

The effects of forward buying are evident throughout the food supply chain, as firms in each segment try to buy products on deal and sell them at a price as close to the standard price as possible. Inventories grow throughout the system, and added transport costs are sometimes incurred when products are diverted from regions where they are being sold on deal to those where they are not. Also, there are considerable costs involved in simply maintaining information about deals and settling disputes between trading partners.

To date, ECR strategies for efficient promotion are less developed than those for efficient assortment and efficient replenishment. In part, this stems from concerns about compliance with antitrust laws. As Thomas, Staatz, and Pierson (pp. 542-545) note, individual firms also have strong incentives to defect from cooperative solutions to the problems caused by promotions. KSA (p. 84) identify three basic principles for trade promotion strategies. First, suppliers should offer their

customers alternatives to buying on deal. Second, suppliers should simplify the terms of their promotions, making them easier to evaluate and compare.

Finally suppliers should use DCS transactions to transmit information on deals to their customers. Relationships established under category management partnerships and incentive created by the unbundling of costs and pass- troughs on promotions that will be part of efficient replenishment strategies will also lessen the advantages gained through reliance on trade promotions, and the EDLP strategies of mass merchandisers and category killers will dampen incentives for using trade promotions.

New Product Introductions: Each year, thousands of new food items are introduced by manufacturers. It is high percentage of these fail. As KSA observe in their overview of efficient product introduction (pp. 87-94), inefficiencies stem not only from wasted development costs incurred by the manufacturer, but also from costs associated with entering and removing product from information systems and inventory build-ups prior to promotions for new products.

ECR strategies for efficient product introductions draw on Quick Response strategies in the apparel industry. Computer based design tools and more flexible manufacturing systems shorten development times and make it possible to produce test market quantities of a new product earlier in the development cycle. In addition, frequent shopper programs and credit card purchases facilitate matching demographic information on consumers with data on buying patterns in test market settings. As a result, these studies yield information not just on whether a product is likely to succeed but also on which consumers are likely to buy it.

As in the case of product promotions, ECR strategies for efficient product introductions are not fully developed. It appears that they will be linked closely to category management activities, however, since new products are part of an efficient assortment. Therefore, they will be governed primarily under loosely structured partnership arrangements.

Lessons from the ECR Initiative

At least three general lessons can be drawn from experience to date in the ECR initiative. First, reengineering can be accomplished in a setting with great diversity of firm sizes and types, and it can accommodate their continued coexistence. Firms of all sizes and types that are able to adopt ECR practices will benefit from them. Despite justified concerns about shifts in the balance of power and difficulties small firms face in adopting ECR practices (Weinstein), this initiative may actually slow down trends toward increased concentration and vertical integration.

Second, there is an extensive tool kit of institutional mechanisms that can be used to reengineer inter firm linkages. These include industry standards, market transactions for unbundled products and services, loosely structured partnerships for exchanging information and expertise, and partnerships that shift decision responsibility across firm boundaries. Matching the institutional mechanism to the problem or opportunity being addressed -- choosing the right tool for the job -- has important impacts on the success of reengineering efforts.

Finally, collective action, coordinated by trade associations or by other industry organizations, can be an effective medium for working toward industry-wide

benefits, even before the distribution of those benefits is known. The trade associations involved in the ECR initiative have been remarkably effective in bringing together competing firms from throughout the food supply chain to develop solutions to common problems and to find ways to exploit shared opportunities. They have also helped educate their members and lower barriers to adopting new technologies and practices. The Land Grant System, which has traditionally played a similar role, has much to learn from what the trade associations have accomplished.

ERP and its impact on SCM

The web-based technologies have revolutionized the way business is carried on and supply chain management and ERP are no exceptions. In order to leverage the benefits offered by this new technology enabler, ERP systems are being “web-enabled." Internet allows linking of the websites to back-end systems like ERP and providing connections to host of external parties. The benefits of such a system are that customers have direct access to the supplier's ERP system and the vendors in turn can provide real-time information about inventory, pricing, order and shipping status. Internet thus provides an interface between ERP system and the supply chain members allowing real-time flow of reliable and consistent information.

To illustrate a benefit of web-enabling ERP, such a facility allows customers to go on-line and configure their own products and get price information and immediately gets to know whether the configured product is in stock or not. This is made possible, as the customer’s request is directly accesses the ERP system of the supplier.

The differences between ERP systems and SCM systems have been subject to intense debate. One of reasons for the same is that the ERP vendors are adding more SCM functionality to their products while SCM vendors are also expanding their functionality, encroaching on the area handled by the ERP vendors. With the vendors of ERP systems and SCM systems adding more and more functionality, the differences between the same have been blurring. For example, major ERP vendors are introducing advanced planning and optimization as an integrated component (also a component in SCM) of their system. In the following table, let us try to understand the key differences between ERP and SCM systems presently available.

EFFICIENT FOODSERVICE RESPONSE

Efficient Foodservice Response (EFR) is a collaborative effort among manufacturers, distributors and operators to align their trading practices and eliminate non-value-adding costs through the supply chain. The purpose is to do away with inefficiencies and wasteful practices and make each component in the chain work in unison with the others to create a highly flexible, reliable and responsive system that responds quickly to consumer/customer demands. A study conducted by Stanford University showed that there is $14.3 billion industry wide in non-value- adding costs accruing throughout the foodservice supply chain (1MB Global, 1999). EFR is based on five principle strategies: Equitable Alliances, Supply Chain Forecasting, Electronic Commerce, Logistics Optimization, and Foodservice Category Management.

Equitable alliances have no economic benefit, but they lay the base for the rest of the EFR strategies. This is a "cost-neutral" mechanism that allows for shifts in the way costs and revenues accrue in the supply chain. To achieve this, the company

must address the complex low of funds within the supply chain and assess how they are measured. Activity-based costing is the fundamental base for value-adding incentives. In this strategy, companies will take a look at their management and organizational structure as well and assess what changes need to be incorporated.

Joint forecasting of demand by supply chain trading partners creates a common view of future sales within the supply chain, combined with an integrated set of planning processes. The industry benefits to be gained from this strategy are estimated to be around $2.9 billion. Initiatives within this strategy combine demand creation and demand fulfillment processes across all segments. These initiatives include standard product identification and bar coding, common product databases, demand and planning information sharing, and market-level reporting and forecasting. The EFR project has a goal to have 100 percent case-level bar coding on foodservice products by December 31, 2001. As of September 2000, 61 percent of cases were coded, up from 54 percent in 1999

The largest EFR initiative, in terms of possible benefits, is business-to-business e--commerce. An estimated $6.6 billion in savings could be reaped from implementation of effective e-commerce trading practices. The majority of these benefits come from reduced administrative costs by restructuring the revenue cycle process between buyers and suppliers. The five assimilated initiatives include business practice simplification, product maintenance EDI (Electronic Data Interchange), revenue cycle EDI, electronic funds transfer, and invoice less payment.

Logistic optimization tackles the physical flow from point-of-supply to point-of-consumption. The industry benefit from this strategy is believed to be $2.7 billion. The initiatives with logistic optimization include direct shipment, consolidation,

shared distribution, coordinated transportation, and cross-docking. For these practices, special transportation and warehouse management software helps businesses gain control of their fleet management which in turn results in improved customer service, accurate routes, reduced distribution costs, and improved driver efficiency.

Foodservice category management incorporates products into the supply network and raw demand in the marketplace. Initiatives include balanced variety, product deletions, new products, and centralized changeups. An estimated $2.1 billion in industry savings may be attributed to this strategy.

ELECTRONIC DATA INTERCHANGE

EDI allows instantaneous, paperless transmission of data within and between firms. Because transactions are standardized, data can be readily transferred into internal information systems, even when those systems differ across firms. Potential cost savings and system- wide efficiency gains from EDI are substantial, but so are the costs of implementation. Considerable progress has been made in the shift to EDI, but benefits can only be fully realized when adoption is universal.

Sterling Commerce was a pioneer in EDI technology and has been at the forefront of its evolution ever since. Today, thousands of companies around the world rely on our EDI products and services including:

- Network Services — A single connection point for the exchange of EDI documents with all of your business partners regardless of platform, standard or protocol.

- EDI Software — Solutions ranging from easy, PC-based products to high-powered, fully integrated solutions.

- Professional Services — Expert help in creating B2B integration strategy, building maps, setting up trading partners, resolving communications issues and much more. We can supplement your in-house staff, reduce the complexity of your current EDI system, or help with overall performance and tuning.

Easy, reliable, and incredibly versatile, Sterling Commerce EDI is the best value for your investment because no company knows more about EDI or takes your EDI requirements more seriously. As long as EDI remains an important part of your strategy, Sterling Commerce will be there to support you with top quality products and services.

COMPUTER ASSISTED ORDERING

Computer Assisted Ordering (CAO) has long been used in warehouse operations to generate orders based on current inventory, movement projections, and optimal reorder points and order sizes. Efforts are being made to implement CAO systems at the retail store level. This will require greater accuracy of the scanner data required to maintain perpetual inventories and changes in firm cultures that value

the judgment and expertise of order writers who base decisions on visual inspection of shelf stocks.

CONTINUOUS REPLENISHMENT PRACTICES

Continuous Replenishment Practices (CRP) is still more sophisticated approach to using data more effectively. Under CRP, the customer (a warehouse or retail store) shares data on item movement and inventory with the supplier (a manufacturer or warehouse). The supplier uses this information to write orders for the customer in a way that minimizes replenishment costs subject to maintenance of an acceptable service level for the customer. For example, under a CRP relationship between a manufacturer and a wholesale distribution centre, an order may be adjusted to reflect the manufacturer's production or delivery schedule. Alternatively, the manufacturer may adjust production or shipment schedules in order to more effectively meet the needs of the distribution centre. CRP systems require accurate data, EDI capabilities, accounting systems that permit sharing of reliable performance data, and trust between trading partners.

Consumer Industrial Products Location: Location Negotiable Level: Manager Job Description Business Consulting professionals focus on strategy and take responsibility for organizational change and business transformation. Supply Chain Management professional’s help clients develop strategies and operating models that integrate planning, procurement, product design, manufacturing and fulfilments functions within an organization, as well as connect suppliers and customers across the extended supply chain.

Key responsibilities may include:

- Planning and managing business diagnosis and planning activities
- Guiding team through problem definition, issue identification and work plan development using problem solving principles and past experience
- Performing/interpreting value analysis to identify value creation opportunities for clients
- Planning and managing effort to define to-be organization processes, capabilities, application of key technologies, and performance measurements / KPIs
- Planning and managing business architecture implementation activities
- Designing and conducting business solution testing and deployment plans
- Monitoring achievement of strategic, financial and operational benefits, ensuring planned business outcomes are achieved and helping to adjust programs if necessary
- Helping define the structural and cultural changes required to reach the goal sequencing those changes

Qualifications

Knowledge of Supply Chain Assessment and Strategy and deep skills in the following skills: Business Model Development, Business Performance Management,

- Transformational Outsourcing, and MA Integration Retail scan-based technology knowledge a must Retail Store Experience or knowledge of Retail Store Processes is required

- Direct Store Delivery Processes and/or Systems (i.e. Ordering, Receiving, EDI, Accounting) experience in Retail and/or Consumer Goods is required

- Business process design Process flow mapping expertise Process analysis assessment for improvements

- Ability to meet travel requirements, when applicable 7-10 Include years of experience

- Bachelor Degree required

Professional Skill Requirements

- Proven ability to build, manage and foster a team-oriented environment

- Proven ability to work creatively and analytically in a problem-solving environment Desire to work in an information systems environment

- Excellent communication (written and oral) and interpersonal skills
  Excellent leadership and management skills

Changing faces of Supply Chain Model in Global Food Market

The structure of the global food industry is continually changing and evolving as food suppliers, manufacturers, and retailers adjust to meet the needs of consumers, which includes demand for wider variety of higher quality products.

Global food retail sales exceed $2 trillion annually, with supermarkets/hypermarkets accounting for the largest share of sales. Additionally, supermarkets, hypermarkets, warehouse-style discount outlets, convenience stores, and combined gasoline and grocery outlets have emerged in numerous countries over the past few years to increase the demand for global food supply. Driven by innovation and competition from private retail brands, food manufacturers are focusing on specific product lines where they have inherent advantages, and target for developing countries for more focused approach.

Expansion in foreign markets is further contributing to the growth of large multinational food manufacturers but local markets are still welcoming small-scale individual retailers to successfully find opportunities within the marketplace.

This enables food manufacturers to become leaders in certain product lines and to better cater to consumer demand for these products in different markets. Therefore, while manufacturer concentration is not evident at the global level for total packaged food sales, firm concentration may exist in specific product lines and regional markets. Firm concentration can be specifically seen for the products

in which the manufacturer's brands are popular, such as in soup, breakfast cereal, and baby food.

'Changing faces of Supply-Chain Model in Global Food Market' examines global food trade patterns and the role of WTO market access rules in shaping the composition of global food trade. It also takes into account the various consumer preferences that are driving changes in global food supply chains, including growth in private label sales and expansion of multinational retailers and manufacturers in developing countries.

COMPANIES USING SUPPLY CHAIN MANAGEMENT TOOLS SUCCESSFULLY

Wal-Mart was a leader in converting their purchasing and distribution cost advantages into lower prices. The chain also selected an **EDPL (Every Day Low Prices)** format to highlight the prices. By responding to customer needs, they grew from 859 stores in 1985 to 2314 Wal-Mart stores and 469 Sam's Clubs as of August 1997 (Wal-Mart 1997). Wal-Mart serves more than 90 million customers per week and is the largest private employer in the U.S. (more than 687,000 employees). The growth of Wal-Mart's net annual sales (Figure 2) has been phenomenal and some experts predict their sales will double in the next five years. Wal-Mart's success encouraged traditional food marketers to examine their distribution system for inefficiencies and to consider the benefits of the EDPL strategy. **Total - $ 104.8 Billion**

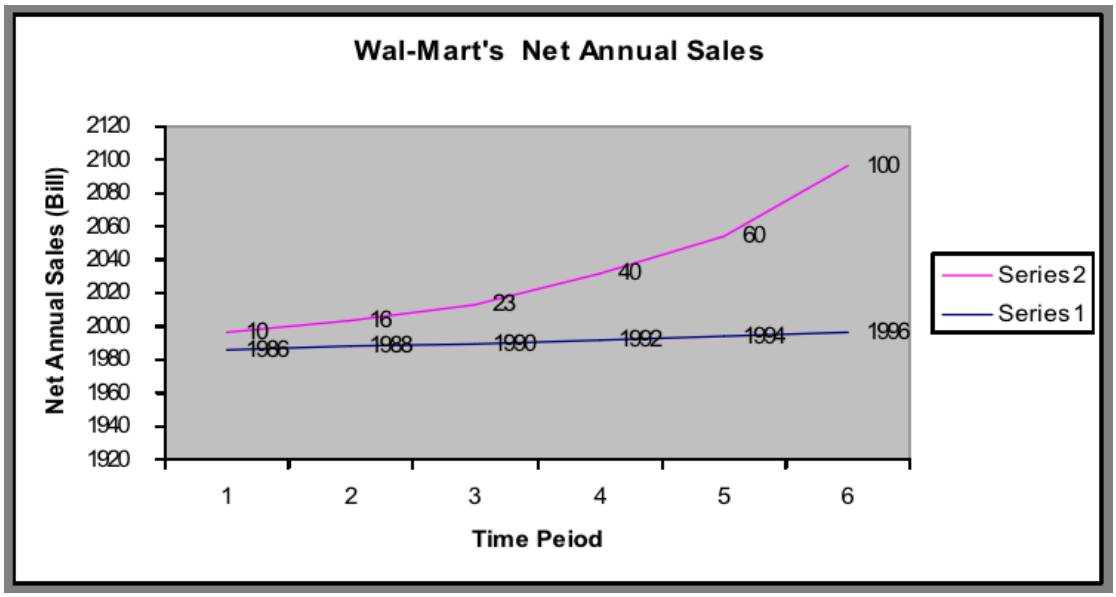


Figure - 4

As discount merchandisers learned how to cut distribution costs, they built larger stores. Wal-Mart, Meijer, K-Mart, Fred Meyer, Target, and others developed supercenters, combining full-size discount stores with full-size supermarkets. Most have than 150,000 square feet of floor space and have weekly sales in excess of $1 million. Grocery products account for about 40 percent of supercenter sales. In 1994, James M. Degen and Company projected that supercenter sales would grow to $42.4 billion by 1998 (Weinstein 1994). Their recently revised forecast (Figure 3) suggests that 1998 sales will exceed $52.4 billion (Food Institute Report 1997b). McKinsey and Company concludes that eighteen hundred supercenters may exist six years from now, more than double the current number (Neff 1997c). These predictions are leading many food retailers to adjust their strategic plans and to focus more on customer service.

Besides supecenters, other retail formats are growing. Before the entry of supercenters, membership club stores were perceived to be a major competitive threat for supermarkets. Item sold by club stores often have large unit sizes. Some

manufactures consider these stores to be a different class of trade because much of their sales are to other businesses. Sam's Club and Price Costco are the two largest chains in this retail segment. James M. Degen and Company estimated club store food and sundry sales in 1996 to be between $25.4 billion and $27.3 billion (Food Institute report 1997i). the number of club stores is expected to rise from 856 in 1997 to 975 in 2001 (Food Institute Report 1997c).

Total retail sales are also expected to increase from $46.1 billion in 1997 to $59.5 billion in 2001 (Figure 4). Although supercenter sales are expected to grow faster, club stores will gain some volume from traditional grocery channels.

Identifying who will the most sales to supercenter and club stores is difficult. Some information comes from two 1994 studies that predicted market shares for grocery business segments. Willard Bishop Consulting compared 1993 share estimates by store type and made projections for 1998 (Food Institute Report 1994b). They estimated supercenters would grow from a 1.7 share in 1993 to a 7.2 share in 1998. Formats that could lose market share included traditional supermarkets (26.1 to 2.6), convenience stores (10.2 to 9.1), and warehouse stores (9.9 to 8.8) and an "other" category that included limited assortment stores (12.4 to 8.6).

Salomon Brothers compared 1993 market share estimates by retail channel and made projections for 2000 (Food Institute Report 1994b). They believed chain supermarkets would grow from a 54.4 share to a 55.4 share, supercenters would grow from 1.4 to 6.9, and wholesale club stores would grow from 4.2 to 5.6 industries during 1996 than in any of the previous five years. Whether the higher concentration is on the industry will promote efficiency and will benefit consumers are still open questions.

One example of growth is the expansion of Boston Market and their home meal replacements (HMR). Boston Market had 1208 stores in July 1997. They offer well-prepared family dinners that customers can pick up on the way home. Similar chains (e.g. Kenny Rogers Roasters and Koo Koo Roo) are also expanding. Many HMR and take-out concepts are being developed. 7-Eleven is introducing "Delhi Central" heat-and-eat products in their convenience stores (Harper 1997). About 82.2 percent of supermarkets plan of offer prepared foods in 1997 (Food Marketing Institute 1997). Many ready-to-heat (RTH) and ready-to-eat (RTE) items are now available in stores.

In November 1991, Procter and Gamble announced their shift toward EDLP. They cut promotion budgets and reduced wholesale prices for many products. Procter and Gamble said they would spend budgets and reduced wholesale prices for many products. Procter and Gamble said they would spend less on coupons and offer stores smaller price incentives for promoting P & G products, angering many retailers. Most supermarkets use a hi-lo strategy, with high regular prices and low sale prices. Because they used deal discounts to promote their stores and build customer traffic, they said P & G was limiting their ability to differentiate their stores (Promo 1992). Instead of returning to the old deal structures, P & G expanded their EDLP.

Conclusion and Recommendation

Changes in the food distribution system may also suggest lessons that producers of primary products and their suppliers may want to consider. Anticipating new competition is important. Few grocers planned for the entry of supercenters or memebership club stores into their markets.

Many veterinarians are feeling threatened by "category killer" pet stores just like supermarket managers who face supercenter competition. Agriculture machinery dealers need to prepare for internet competitors who stock every item farmers need and ship parts overnight directly to farm shops. Some supermarkets are already facing competition from companies that take grocery orders over the internet and deliver to the customer's home.

Leading firms in this "virtual grocery store" field include Peapod, Shoppers express, Streamline, Net grocer and Wal-Mart. Perhaps improving customer service and developing loyalty marketing programs now would be good preparation for this potential source of competition. Other firms are considering entry into agricultural business sectors for e.g. Wal-Mart and Home Depot have explored entering farm supply business. One way to stay ahead of the competition is by learning from other industries.

If initiatives like ECR and EFR or strategies like EDLP are beneficial for firms in one sector, they may be profitable for others. Perhaps food manufacturers, wholesalers and retailers who develop superior techniques to manage their inventories, handle orders and bills, plan promotions, or transport products could help other business benchmark their systems.

If food marketers had focused on profit instead volume, much of the waste in distribution and marketing budgets could have been eliminated. The recent development of partnerships and alliances between suppliers and customers has considerable merit. By working together, food manufacturers and retailers are lowering their costs. Too many marketers copy competitors who they mistakenly believe know how much to spend and how to spend. Without evaluations, inefficient marketing techniques tend to be repeated and replicated.

Strategy experts recommend that firms should plan for change. Successful firms should try to build their strengths today in order to further distinguish their products in future. Smart business leaders should also prepare for additional abbreviation and acronym invasions. The letters may mean different things and the technologies may vary, but change is inevitable and good planning will help reduce the surprises to a manageable number.

Limitations

Any study which is undertaken has some limitations. This study also has following limitations:

- 95% of the Retail food structure is unorganized in India. Whereas the retail structure of U.S is highly organized, hence most of the examples are taken from U.S based companies.

- Since most of the examples are taken from U.S based companies like Wal-Mart etc, hence many things don't apply currently but will be applied in future.

References

http://www.nationjob.com/job/tope920

http://www.sterlingcommerce.com/Products/EDI/

www.haworthpress.com/store/E-Text/View_EText.asp?

http://dsp-psd.communication.gc.ca/Collection/Statcan/21-601-MIE/21-601-MIE2002056.pdf

http://egon.cheme.cmu.edu/Papers/GrossmannChall.pdf

http://www.apec.umn.edu/Working_Papers_from_The_Food_Industry_Center.html

http://kamlabhatt.wordpress.com/2006/07/04/reliances-retail-plans/

http://www.gs1india.org/ABOUT/ECR.htm

http://www.efr-central.com/

http://www.ecraustralasia.org.au/

http://www.ifdaonline.org/webarticles/anmviewer.asp?a=241&z=32

www.cfsan.fda.gov/~dms/secgui11.html

www.fmi.org/isac/isacorgstructure.pdf

Appendix

Food Transportation and Supermarket Industry

In 1998 Amir Antebi from SITEST became the Fourier Australian & New Zealand Distributor

For the food transportation and supermarket chain we recently completed a product demonstration...

The application process begins at a huge chiller, as big as a football field, with 7 loading docks on each side. They receive meat after processing. Before it is sent to supermarkets across the country it is divided up into different cuts and combinations and designated a transportation run to a different city. On arrival the cuts are again divided for delivery to the local supermarkets.

The meat's temperature throughout this process has to be constantly monitored. It cannot freeze or go above a certain temperature. The customer is experiencing problems with the current data logger because it takes 10 days to receive the data after a transportation run. This is too late and the customer is suffering large costs in spoilage because there is no way to immediately detect alarm breaches and if it was the responsibility of the transport company or at the receiving shop.

The supermarket chain was particularly attracted to the Fourier product because of the wireless and alarm features. The MicroLog PLUS can place a receiver, software and Internet connection at any point on the chain. With alarms via SMS, or pager the customer knows immediately, well before the doors open, if there has been any breach in temperature level. With the alert, action can be taken and responsibility can be assigned. The downloaded data clearly shows whether the threshold level was crossed during transportation, on the dock, or in the store.

During the demonstration we set up the receiver in the customer onsite office which was in direct line of sight to the docking area. Four loggers were placed on the trucks which then left the dock and traveled in the area.

We were able to receive transmission up to a range of 150m from the docking point, which was well out of line of sight. Earlier when I was evaluating the MicroLogPlus system I conducted a test to see the maximum distance I could still receive the signal from the Micro Log cradle. Testing near our office, my daughter walked away from the office with a data logger and I only stopped receiving in the office when she was beyond a range of 450m and that's with lots of houses, trees and walls.

The customer was very happy with the results of the test, since for the application's need that was more than enough - data can be captured from the truck entering the parking bay, even before parking manoeuvring. Currently we are in stage two, with the customer having ordered a number of units for field trial.