
Consumer Packaged Goods - Food Manufacturing Industry Brief

October 2002

Executive Summary

Definition

Consumer Packaged Goods (CPG) Food Manufacturer's products must organize around their retailers and the consumer's demand in a way that not only meets today's but tomorrow's challenges. Food manufacturers produce several kinds of items:

- ◆ Dairy Products
- ◆ Bakery, Cereal and Grain-based Products
- ◆ Confectionary Products
- ◆ Desserts
- ◆ Low-fat, Low-calorie, Low-sodium Foods
- ◆ Meals and Meal Components
- ◆ Meat, Poultry and Seafood Products
- ◆ Organic and All-Natural Products
- ◆ Side Dishes (Rice, Pasta, Beans and Vegetables)
- ◆ Snacks

Industry Description

Food manufacturers need to have strong relationships with both retailers and consumers to remain competitive. The low profit margins drive the nature of the industry. Several contributing factors include:

- ◆ Multiple players across channels.
- ◆ Cost-reduction. Manufacturers seek supply chain management efficiencies at every opportunity.
- ◆ Brand recognition. Food manufacturers need to continually build on their brand equity.

Industry Trends

Food Manufacturers experience the same trends in the Americas and Europe/ Middle East:

- ◆ Changing consumer wants and needs: Consumers used to be more concerned about price, now are more concerned with quality and convenience.
- ◆ Growth of retailer power: As retailers consolidate, they have more power in the supply chain. It is up to the manufacturers to build strong relationships with retailers and form partnerships to work together to share valuable product data.
- ◆ Product packaging and shelf space: As relationships build with retailers, manufacturers need to consider gaining support for their products' shelf space. Attractive packaging can assist manufacturers with their efforts.

Solutions

Food Manufacturers understand the need to leverage technology and information to provide better service to their customers. Although they understand the potential benefits of e-business, they want to ensure that these new solutions will be implemented in a cost effective way. In a recent survey conducted for the Grocery Manufacturers of America¹ they outlined how they believe e-business should be approached:

1.e-business is a top priority — While the focus may have shifted from B2C to B2B and B2E, the overriding principles of e-business are firmly planted in the minds of executives in the consumer packaged goods (CPG) industry.

2.CPG companies are adopting a pragmatic approach to e-business — An increasingly conservative approach to IT overall is washing into the e-business Arena, causing a growing number of CPG companies to consider themselves to be lagging their peers in e-business.

3.The marketing and purchasing organizations are the primary drivers of e-business activity; IT provides the enabling infrastructure — e-business activity is occurring in many functional areas of CPG companies; however, marketing and (to a slightly lesser extent) purchasing are leading the charge.

4.e-business investments are evaluated based on strategic criteria — The rationale for evaluations of e-business activities are largely based upon the strategic nature/fit of the activity, thus demonstrating how integrated e-business has become with overall business strategy.

5.Current priorities emphasize e-business infrastructure and internal operational efficiency — After the chaos of the initial forays into e-business, CPG companies have come to the realization that a solid collaborative infrastructure is required to make B2B transactions work. This is where the focus of most e-business activities lies.

6.The B2B stalemate will be unlocked by a segmented approach — Communications with trading partners (customers as well as suppliers) forms the basis for B2B. Survey results indicate that a “one size fits all ” approach does not work. Currently, the largest and most aggressive companies in the industry are working through a complex set of varied modes of communication designed to enable B2B.

¹ Grocery Manufacturers of America, 2001 E-Business Report

Key Themes in Food Manufacturers

- ◆ The Food Manufacturing Industry is a mature industry in most developed countries. As a result, growth of shipments is very low. In the US this is not expected to exceed 2-3% per year. Manufacturers are therefore looking to global expansion and to adding value to their products in order to increase revenue.
- ◆ Consumers have become more demanding. Consumers are expecting products that fit their individual needs and desires i.e. healthy, ethnic, specially packaged etc. They want this at the lowest possible cost and are willing to shop for what they want.
- ◆ Concentration in the industry continues at a rapid rate. In order to achieve economies of scale, manufacturers continue to grow, usually through mergers and acquisitions. The need to grow is also driven by the fact that their customers: Supermarkets, Wholesale Clubs etc., are also consolidating.
- ◆ Brand management has a huge impact on company profitability. CPG companies are working to continuously build equity through its customer relationships and promotions. Managing promotions is complex and difficult. Since the cost of promotions is a large part of the product cost, manufacturers are looking to this area for major improvements.
- ◆ The industry is extremely competitive. This in turn means that product prices are continuously under pressure. To be able to remain price competitive, manufacturers are continuously striving to reduce costs. Manufacturers are looking at the entire supply chain to identify possible savings.
- ◆ The ability to compile accurate information on consumer and purchasing trends is key to the success of the manufacturers. This information is also extremely important to the manufacturers as they negotiate with their customers. Since most supermarket chains have installed checkout scanners, they now often have better information on product sales than the manufacturers.

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1.0 An Introduction to Food Manufacturing

1.1 Consumer Packaged Goods (CPG) Companies

The essential nature of a CPG company—that it sells low-cost products at relatively small profit margins—imposes on management a set of concerns and constraints unique to the industry.

The majority of consumer goods products must be sold in great quantities in order to generate an appreciable level of profit for the companies that produce them. For example, the profit margin on a bottle of ketchup might be only a few cents. It's essential that consumer goods products be produced in tremendous volume and that every attempt be made to minimize production costs.

The general approach under which consumer goods products are manufactured reflects the requirements for high-volume, low-cost production. These products are produced on production lines that transform such raw commodities as grain, cocoa, coffee, rice, and chemicals into finished goods.

CPG industry products are manufactured by processes that combine and add value to raw materials rather than by the assembly of component parts that characterizes discrete manufacturing operations. Manufacturing operations acquire raw commodities, ingredients, and packaging materials at the front end of a manufacturing process. Then, through a series of processes that draw upon such resources as time, motion, heat, speed, and pressure, these materials are transformed into finished goods that are distributed to consumers.

CPGs share two key characteristics:

- They have a relatively short life span, especially when compared to hard goods, such as tools, furniture, and electronic equipment.
- They have a relatively low unit price.

This means that to generate profits for their manufacturers, CPGs must be sold in tremendous volumes. It's not uncommon for a CPG company to ship tens of millions of units of a single product in any given year.

The strategy employed by consumer packaged goods (CPG) companies is driven by a simple premise: competition will be fierce and growth will be very low in the traditional geographies such as North America, Europe and Japan. The new and emerging markets of Latin America, China, India, and the rest of Asia offer the best opportunity for significant growth. These growth factors are driving the major CPG companies to review the use of cost cutting in the traditional geographies and determine if there are alternatives while investing in new facilities and acquiring smaller companies in the emerging markets. There is also significant investment activity in product innovations to support brand equity and maintain category profitability.

In order to understand why CPG companies focus so intently on improving profitability, consider these figures:

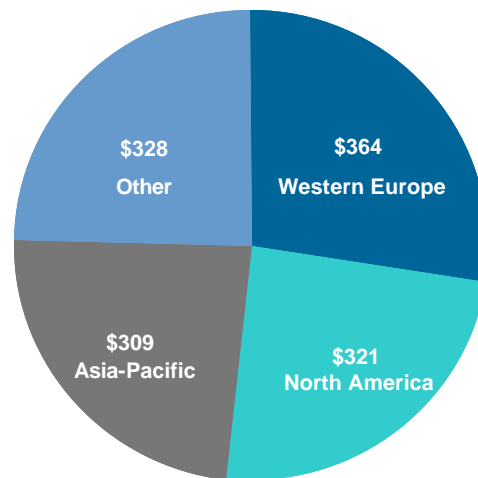
- Approximately 20% of the cost of consumer goods products goes to suppliers (for example, farmers) who provide raw commodities.
- Another 29% of the cost of the product goes to retailers.
- Approximately 16% of the cost of the product goes to brokers or wholesalers, and another 6% is devoted to transportation costs.
- This means that the remaining 29% of the shelf cost of the product goes to the consumer goods company.

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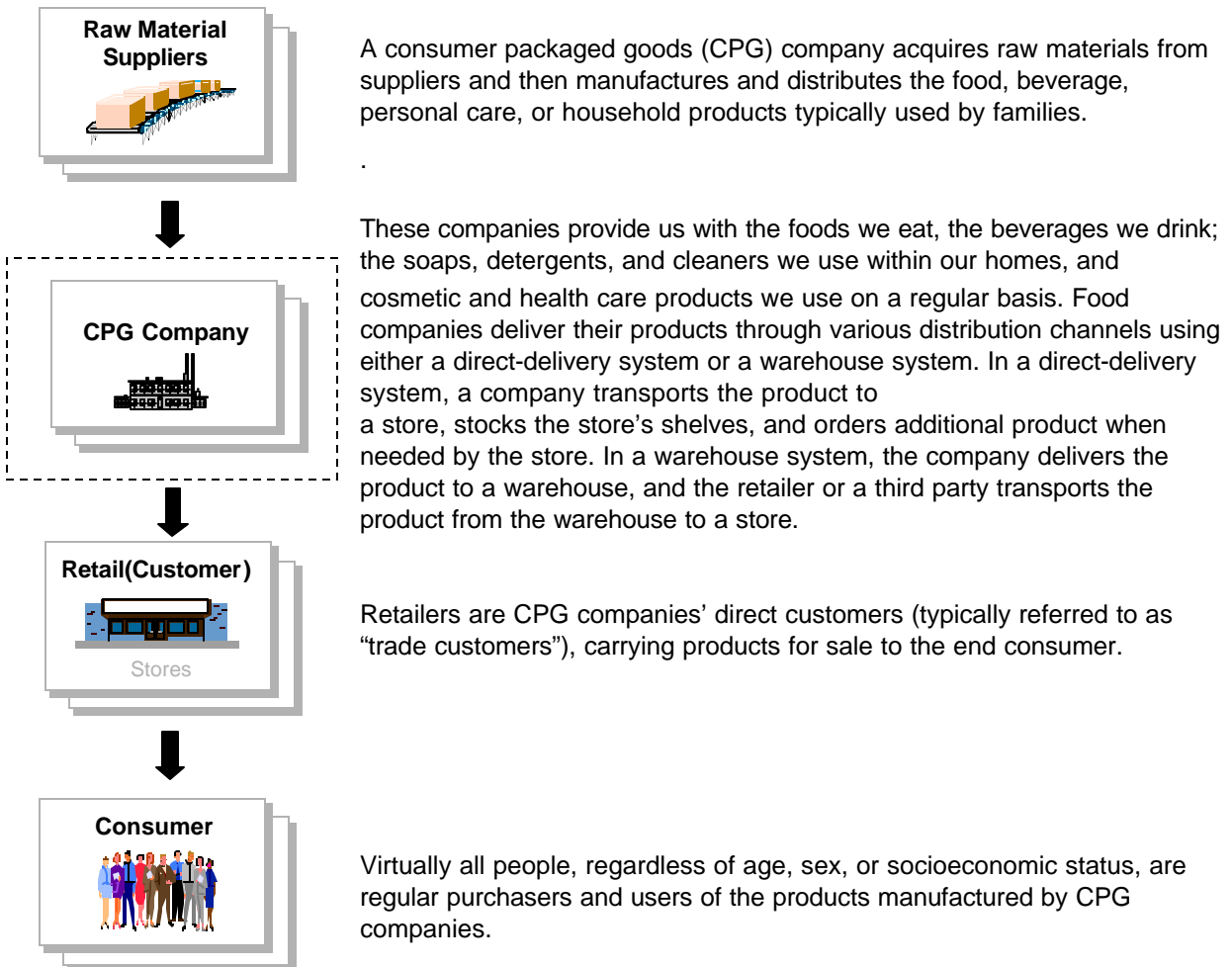
Global Packaged Foods Revenue, by Region, 2000

Total: US\$1,322 billion



Western Europe is the world's largest packaged foods market, followed by North America and the Asia-Pacific region. From 1995 to 2000, total global packaged foods revenue has grown at a modest rate of 3.4 percent. Food and non-alcoholic beverages' total revenue from 2000 was \$1,720B.

1.2 CPG Company Supply Chain



Other roles to consider:

Broker: An agent who does not have physical control of goods but who represents the buyer or seller of a consumer goods product.

Common Carrier: A carrier, independent of any particular CPG company, that offers services to all shippers.

Jobber: Another name for a wholesaler. A rack jobber is a wholesaler whose personnel go into retail outlets to set up displays, supply the products required to keep the displays stocked, monitor sales, and remove and replace stale or damaged goods.

Manufacturer's Agent: An agent who represents a manufacturer, usually in an exclusive territory or product area for an extended period of time. This agent is also known as a manufacturer's representative.

Middleman: An intermediary, such as a wholesaler, broker, or chain buyer, between the manufacturer of a product and the ultimate consumer. In some industries, a retailer is considered to be a middleman. This is not usually the case in the CPG industry, where the term is used to designate agents who function between the manufacturer and the retailer.

Wholesaler: An agent between the manufacturer of a CPG product and the retailer who sells it. Might also be called a jobber, distributor, or broker.

1.3 Items Distributed

The subcategories can be further divided according to the established SIC codes:

SIC Code	Description
2011	Meat Packing
2015	Poultry Slaughtering and Processing
2022	Cheese, Natural and Processed
2024	Ice Cream and Frozen Desserts
2032	Canned Specialties
2033	Canned Fruit and Vegetables
2035	Pickles, Sauces, Salad Dressing
2037	Frozen Fruits and Vegetables
2038	Frozen Specialties
2041	Flour and Grain Mill Products
2043	Cereal and Breakfast Foods
2044	Rice and Milling
2051	Bread, Cake and Related Products
2052	Cookies and Crackers
2061	Raw Cane Sugar
2064	Candy and Other Confectionery Products
2076	Vegetable Oil Mills
2092	Fresh or Frozen Prepared Fish
2095	Roasted Coffee
2096	Potato Chips and Similar Snacks
2098	Macaroni and Spaghetti
2099	Food Preparations

The U.S. food and nonalcoholic beverage industry comprises establishments that process or manufacture foods and beverages for human consumption, plus related products like chewing gum and vegetable or animal fats and oils. According to estimates by Standard & Poor's, total food and beverage sales at the retail level rose 3.9% to \$833.8 billion in 2001, from \$802.3 billion in 2000. Retail sales include products for consumption at home (\$457 billion in 2001) and away from home (\$376.8 billion).

The market remains fragmented, with the largest firms having the most impact on trends. According to the U.S. Census Bureau, approximately 20,878 establishments manufactured food, beverages, and kindred products (including alcoholic beverages) in 1997 (latest available data). Most producers of these goods employ relatively few workers. At year-end 2000, the domestic industry employed 1,692,710 million people in the United States, according to the Bureau of Labor Statistics.

Two dozen firms produce about one-third of food sold at the retail level in the United States. The U.S. packaged food industry remains highly fragmented overall. Standard and Poors states that many food companies are smaller firms that produce a limited number of products (such as baked goods, dairy products, condiments, or snack foods) for regional or specialized markets.² S&P also states that, "regional firms may also serve as contract manufacturers of private-label goods for grocery store chains. In contrast to the smaller players, the top national firms enjoy significant brand-name recognition. To manage their operations and create economies of scale, they focus on multimillion-dollar products that can be sold nationally. They tend to ignore regional products and preferences, except in international Markets."³ The largest producers among them are Kraft Foods Inc. (with \$33.9 billion in fiscal 2001 sales), ConAgra (\$27.2 billion), PepsiCo's Frito-Lay and Quaker Foods divisions (\$16.5 billion), H.J. Heinz (\$9.4 billion), and Dean Foods (\$9.4 billion).⁴ These companies have evolved from regional firms to national and international producers.

"According to the U.S. Department of Agriculture (USDA), 81% of American consumers' spending on U.S. farm products goes to pay for the marketing costs involved in bringing a raw farm product to end users. As defined by the USDA, such costs include labor, packaging, transportation, energy, advertising, and promotion. The remaining 19% covers raw material costs of agricultural commodities, which are discussed below."⁵

Advertising and marketing have become more expensive over the years, mainly because of rising costs for labor, transportation, food packaging materials, and other inputs. According to S&P, from 1990 to 2000, the cost of marketing farm foods increased 57%, to approximately \$538 billion. This is a significant change in the industry.

Food manufacturers have a low sensitivity to commodity prices. They are less impacted by the occasional change in raw material costs than are agribusiness companies, the major buyers of these commodities. Standard and Poors states that, "the processing of agribusiness commodities is a low-margin, low-value-added business. By comparison, there's more value added at the packaging and marketing level, so costs are less commodity-based and margins are easier to maintain from year to year."⁶ In addition, the packaged food producers' use techniques to help limit their exposure to commodity price fluctuations. Also, the supply chains of food manufacturers are expanding globally. International producers of raw materials are another source for manufacturers.

² Standard and Poors, Industry Report, 2002

³ Standard and Poors, Industry Report, 2002

⁴ Ibid.

⁵ Ibid.

⁶ Ibid.

2.0 Food Manufacturing CPG Companies

The industry is made up of companies that sell their products to drug and grocery stores, mass merchandisers, warehouse clubs, and other retailer outlets. Worldwide, consumers spend about \$1.3 trillion on these everyday items, with the US accounting for about 25% of the total. Big-name companies, such as Sara Lee and ConAgra are some of the food industry's key players.

TOP 25 FOOD & BEVERAGE COMPANIES — 2001

(Ranked by sales, in millions of dollars)

PACKAGED FOOD & BEVERAGE SALES

COMPANY	2000	2001	% CHANGE
1. Nestlé SA	45,340	47,348	4.4
2. Kraft Foods	34,033	33,871	(0.5)
3. ConAgra Foods	25,534	27,194	6.5
4. PepsiCo	25,479	26,935	5.7
5. Unilever NV	22,317	25,916	16.1
6. The Coca-Cola Co.	20,458	20,092	(1.8)
7. Coca-Cola Enterprises	14,750	15,700	6.4
8. Groupe Danone	13,412	12,912	(3.7)
9. Tyson Foods	7,158	10,751	50.2
10. H.J. Heinz	9,408	9,430	0.2
11. Dean Foods	5,756	9,421	63.7
12. Kellogg	6,954	8,853	27.3
13. Pepsi Bottling Group	7,982	8,443	5.8
14. Sara Lee	7,915	7,970	0.7
15. General Mills	6,700	7,078	5.6
16. Cadbury Schweppes plc	6,946	6,842	(1.5)
17. Campbell Soup	6,267	6,664	6.3
18. Smithfield Foods	5,150	5,900	14.6
19. Hershey Foods	4,221	4,557	8.0
20. Dole Food	4,763	4,449	(6.6)

Source: Company reports

Some of the larger manufacturers are described below::

Kraft

The US's #1 food company, Kraft Foods, was spun off by Philip Morris in June 2001. Kraft Foods operates Kraft Foods North America and Kraft Foods International. Kraft Foods North America's business includes the world's largest cheese brand (Kraft) and the largest cookie and cracker business (Nabisco). Other brands include Oscar Mayer meats and Post cereals. Kraft Foods International sells Kraft products in 140 countries. <http://www.kraft.com>

Nestle SA

With instant coffee, baby formula, and the bottled water to mix them with, Nestlé is the world's #1 food company. It is the world leader in coffee (Nescafé) and bottled water (Perrier). Ranging from pet food to pasta, chocolate, and dairy products, its largest global brands include Buitoni, Friskies, Maggi, Nescafé,

Nestea, and Nestlé. Growth has come from acquisitions and steady penetration into developing markets. Nestlé has about 500 factories in more than 70 countries. <http://www.nestle.com>

ConAgra

ConAgra distributes to virtually every eating establishment and every eating location. ConAgra has \$27billion in sales generated from the sales of branded and value-added products. It is one of the largest brand and foodservice providers in North America. Some of their famous brands include Healthy Choice, Orville Redenbacher and Butterball. <http://www.conagra.com>

Unilever

Unilever N.V. and UK-based Unilever PLC each own half of Unilever, one of the world's largest packaged consumer goods firms. Unilever N.V. and Unilever PLC have a single board of directors and operate as a single entity, although they list their stocks separately. Both present the consolidated accounts of Unilever as their respective consolidated accounts. However, Unilever N.V. owns 75% of the US operations. (Its Anglo counterpart owns the rest.) Unilever's products include Lipton (teas), Dove and Lever 2000 (soap), Mentadent (toothpaste), Suave (shampoo), Q-Tips, and Vaseline. Unilever bought diversified food maker Bestfoods in 2000. <http://www.unilever.com>

PepsiCo

PepsiCo's soft drinks (Pepsi, Mountain Dew, Slice) make up about one-quarter of its sales. (Bottling operations are run independently.) More than 50% of its sales come from Frito-Lay, the world's #1 maker of snacks such as corn chips (Doritos, Fritos) and potato chips (Lay's, Ruffles, WOW!). PepsiCo grew even larger with its August 2001 purchase of The Quaker Oats Company (Gatorade, Cap'n Crunch, Aunt Jemima). <http://www.pepsico.com>

Groupe Danone

Groupe Danone is one of the world's largest food producers and the world leader in dairy products (including yogurt, cheese, and dairy desserts) and biscuits (cookies, crackers, and snacks). Its Evian and other brands make it #2 in bottled water (behind Nestlé). Danone has dozens of regional and international brands, including Dannon yogurt (US), Jacob's and LU cookies and crackers, and HP and Lea & Perrins sauces. <http://www.danonegroup.com>

Tyson Food

Tyson is the largest meat processing company in the world - it has been the largest chicken producer and recently purchased beef and pork giant IBP Fresh Meats. In addition to fresh meats, the company produces processed and pre-cooked meats, refrigerated and frozen prepared foods. Having already successfully put a brand name on fresh chicken, Tyson is hoping to do the same with its Thomas E. Wilson brand for beef and pork. Tyson sells its products in more than 100 countries and is looking to expand overseas. <http://www.tyson.com>

HJ Heinz

One of the world's top food producers, producing over 5,500 items, Heinz produces ketchup, condiments, sauces, frozen foods, beans, and pasta. It also sells tuna, soups, infant foods, and pet food, but is spinning off those businesses to Del Monte Foods Company. Heinz controls 60% of the US ketchup market. The company's other leading brands include Ore-Ida frozen potatoes (which has more than 50% of the branded potato market share, Star-kist tuna and Weight Watchers foods. Heinz gets nearly half its sales from

foreign operations (mainly Australia, Canada, New Zealand, the UK, and Northern Europe).

<http://www.heinz.com>

Sara Lee

Sara Lee Corporation is a global manufacturer and marketer of high-quality, brand name products for consumers throughout the world. With headquarters in Chicago, Sara Lee Corporation has operations in 58 countries and markets branded products in more than 180 nations. The Sara Lee Foods business consists of packaged meats (82% of total sales in fiscal 2001) and baked goods (18% of total sales in fiscal 2001). Sara Lee is the world's largest packaged meats company. It holds the number-two retail position in the \$11 billion U.S. packaged meats industry. In addition, Sara Lee has the largest packaged meats business in Europe and holds a leading position in Mexico. It is the number-one frozen baked goods company in the United States. With the acquisition of The Earthgrains Company in early fiscal 2002, Sara Lee is now the second-largest fresh bread company in the United States, and a leader in the refrigerated dough category in the United States and Europe. <http://www.saralee.com>

Maruha

Maruha is top seafood producer. It gets more than half of its sales from fish and shellfish. The company also provides canned, frozen, and other processed convenience foods. Sugar, meats, animal feeds, and fish byproducts for use in health foods, cosmetics, and drugs also fill out its bottom line. Conservation efforts since the late 1970s forced Maruha to trim its fishing fleet, but it now has joint ventures in 15 countries to obtain and process fish. <http://www.maruha.co.jp>

Nippon Suisan Kaisha

Nippon Suisan Kaisha "fishes" second only to Maruha in Japan. The company is the second-largest marine products firm in Japan. Its fishing operations account for half of its sales. Nippon Suisan Kaisha also processes frozen foods and distributes them. Other business segments include production of pharmaceuticals and cold storage. With half of its seafood sales in foreign countries, the company recently bought a 50% stake in Sealord, New Zealand's largest marine products company. It also has acquired Unilever's North American seafood businesses (the Gorton's brand in the US and BlueWater in Canada). Nippon Suisan Kaisha has some 45 subsidiaries, mostly in Japan, but also in about 20 other countries.

<http://www.nissui.co.jp>

La Doria

La Doria is a leading Italian processor of tomato-based products (chopped, peeled, strained, and in ready-to-serve sauces). It also makes canned fruit, vegetables, and pasta products; fruit juices; and iced tea. Most of La Doria's products are sold under the private labels of Europe's top grocers, including Tesco and J Sainsbury; it also offers La Doria and other brands. Exports account for more than three-fourths of La Doria's sales. The company has a 51% stake in the UK's Gerber La Doria and a 56% stake in Pomagro, which makes tomato preserves. <http://www.ladoria.it>

Goodman Fielder

Goodman Fielder is Australia's largest food company. It produces food for Australia and New Zealand, mostly, but about 40 other Pacific and Asian countries as well. The company's main brand names include Buttercup bread, Meadow Lea margarine, Uncle Tobys cereals, Bluebird snacks, and White Wings cake mixes. Its other products include flour, cooking oil, mayonnaise, vinegar, pizza, pasta, and prepared meals.

<http://www.goodmanfielder.com.au>

Associated British Foods (ABF)

Associated British Foods (ABF) introduced sliced bread in the UK during the 1930s, makes the UK's popular Allinson and Kingsmill brands. ABF also serves up a full dish of teatime snacks, including Ryvita crispbread and Twinings teas. The company sold its Burtons Biscuits unit to US investment firm Hicks, Muse, Tate & Furst. Its British Sugar subsidiary makes Silver Spoon sugar; other divisions make glass, food ingredients, and feed. <http://www.abf.co.uk>

Northern Foods

One of the UK's largest food manufacturers, Northern Foods makes prepared and convenience foods under retailers' brands such as Marks and Spencer's popular St. Michael label and under its own brand names. Its products include Fox's Biscuits, Batchelors canned foods, Hollands pies, entrees, pizza, fruit juices, and baked goods. Marks and Spencer, J Sainsbury, Tesco, Safeway, and ASDA supermarket chains are major customers. In conjunction with the Kerry Group, the company's NFT Distribution subsidiary ships its chilled foods across the UK. <http://www.northern-foods.co.uk>

Sigma Alimentos

Sigma Alimentos is one of Mexico's top producers of refrigerated and frozen foods. Sigma's processed meat, cheese, yogurt, and frozen prepared meals reach most of the Mexican food market and are sold in traditional corner stores and modern supermarkets. The company's brands include Chalet, El Cazo Mexicano, Fud, and La Villita, among others. Sigma, the food division of conglomerate Alfa, has exclusive rights to distribute Con Agra (Banquet), Yoplait, Oscar Mayer, and Tropicana products in Mexico. The firm exports to the US and Latin America. <http://www.sigma-alimentos.com>

4.0 Suppliers

Suppliers range from a wide variety of raw materials depending on the product. Many suppliers are regionally located. According to Standard and Poors, “the food processing industry’s second largest expense is agricultural commodities, which account for about 19% of total costs. Commodity expenses have declined steadily as a percentage of total food processing costs for more than two decades.”⁸

Domestic food companies generally fall into two groups: those engaged in the early or middle stages of making a processed food product. Referred to as “agribusinesses,” these companies concentrate on the production of food and tend to include activities like harvesting, milling, or processing of raw agricultural commodities. These companies also plant and raise crops themselves. The majority of commodities from farmers. Agribusinesses’ end products generally are sold to food processors and food packagers. Food manufacturers use these materials to create the final product for consumers.

Raw material producers include Archer-Daniels-Midland Co., Corn Products International Inc., and Cargill Inc. These companies process and merchandise raw materials, such as corn, wheat, and soybeans. S&P states that, “their end products include oils, syrups, starches, and meals used in the food and feed industries, as well as corn sweeteners used in soft drinks.”⁹ Other agribusinesses — such as meat packers IBP Inc., ConAgra, and Hormel Foods Corp., and poultry processors, Tyson Foods, and ConAgra process livestock and chickens for retail sale.

⁸ Standard and Poors, Industry Report, 2002

⁹ Standard and Poors, Industry Report, 2002

5.0 Business Drivers

CPG Food Manufacturers companies face changing consumer demands, retailer consolidation, increased alternative channel competition and geographic expansion, in addition to the always present cost cutting pressures.

5.1 Meeting New Customer Demands

Changes in consumer demographics and lifestyles are driving an ongoing evolution of the food products industry. A retailer's survival depends on meeting the needs of its customers. As a result, CPG companies have increased their product offerings to meet retailers' needs and will have to continue to do so.

All in all, demographic shifts are changing our food industry. This evolution has had a substantial impact on food consumption patterns. Consumers are changing how they shop and what information they use to make purchasing decisions:

- ◆ Consumers have access to increasing amounts of information and increasingly powerful tools to easily process information according to their needs.
- ◆ Consumers are becoming more health conscious.
- ◆ The population is becoming more diverse on an increasingly micro level (diverse neighborhoods, as opposed to multiple ethnic neighborhoods.)

In short, these trends will lead to a consumer population that will increasingly demand:

- ◆ A wider array of products from which to choose at each shopping location and
- ◆ Online shopping services¹⁰

The tastes and lifestyles of the consumer have changed dramatically over time. Consumers used to be very concerned with the amount spent on products and their value. Now, many consumers are more concerned with nutrition, quality, convenience and health. If a product is of high quality, the consumer is more interested in it and its benefits. It is important for CPG companies to diversify their product lines. Many consumers live in or around cities. The world's population is becoming more diverse with ethnic minority groups increasing in size.

In the United States, the rising average age of its residents is the primary long-term demographic trend affecting the nation's food companies. The advancing age of Americans has been impacting food production and marketing — the nearly 77 million people born between 1946 and 1964, who account for 30% of the current U.S. Population. As food marketers well know, “baby boomers” are at a stage of life in which people usually focus more on nutrition and weight maintenance. However, baby boomers' increased work and family responsibilities reduce the time available for exercise just as their metabolisms are slowing. This has been creating new consumer needs in the U.S.

Several new products have been introduced to accommodate the boomers. S&P states that, “among the new products seeking to satisfy these needs are “better-for-you” foods that are convenient to prepare. In the early 1990s, for instance, ConAgra introduced its Healthy Choice brand of low-fat, low-sodium foods, which is now hugely successful. The Healthy Choice label, initially adorning only a small line of frozen dinners, has a wide variety of food items such as soups, luncheon meats, breakfast cereals, and ice cream. Healthy Choice products currently generate more than \$1 billion in annual sales. Other major food manufacturers have introduced “better-for-you” products with varying degrees of success.”¹¹ Other new products include

¹⁰ Pembroke Consulting, 1998.

¹¹ Standard and Poors, Industry Report, 2002

low-fat frozen dinners and shelf-stable products from Weight Watchers (produced by H.J. Heinz) and Lean Cuisine (Nestlé S.A.), as well as, low-sodium and/or low-fat ready-to-eat soups from Campbell Soup and Progresso Quality Foods Co. (a division of General Mills); low-fat cookies and crackers under the SnackWell's label from Kraft Foods' Nabisco division; and low-fat hot dogs under ConAgra Foods' Healthy Choice brand.¹²

S&P cites that, "food companies are well aware that baby boomers are entering middle age. As reported by *Prepared Foods*, a trade journal that tracks the U.S. food industry, studies show that average calorie needs for people aged 50 and older decline by about 10% every 10 years."¹³

In addition to changing nutrition needs, as the population ages, many are growing in affluence, which lets them travel and dine out more frequently. Food manufacturers have responded to this opportunity by selling more products through such outlets as restaurants and public institutions. Food companies also anticipate that the "wealthy" consumers will be willing to spend more for "home-cooked" products and meals that can be prepared quickly.

Other Opportunities for Food Manufacturers

Of course, market-savvy food companies look for growth opportunities in all age groups. In the over-65 group, for example, medical breakthroughs and increased attention to healthful living have resulted in increased longevity. Prompted by older consumers' demands for nutritionally enriched items, food manufacturers may be entering a new era in processed products. For decades, the processed food industry has fortified its offerings with vitamins and other nutrients, and it has capitalized on healthy eating trends by offering high-fiber, low-fat products.

Today's food makers say their next step may be to compete with the pharmaceutical industry by offering "nutraceuticals" — processed food products that would replace vitamin supplements and other dietary aids. The industry hopes that it can eventually release products that will help prevent or even reverse some diseases. Food companies are excited about this new and potentially lucrative niche. Currently under investigation is the role that soy proteins play in inhibiting cancer and heart disease. Also of interest is the potential link between antioxidant compounds — vitamin C, vitamin E, and beta-carotene — and the prevention of cancer, cardiovascular disease, and cataracts. While the Food and Drug Administration has only recently begun to allow companies to make limited health claims for some foods containing soy proteins, food companies believe such products will have broad appeal with the aging American population.

At the other end of the age spectrum, the population of American children aged five to 17 is projected to total approximately 52.4 million by 2005, according to Census Bureau estimates. Although this age group is expected to account for only 18.2% of the U.S. population in 2005, children have significant clout in influencing their parents' purchases.¹⁴ Food manufacturers view these youngsters as important, and they hope to gain lifelong brand-loyal customers.

5.2 Brand Management

Brand management has a huge impact on the CPG food segment. Companies are constantly looking for ways to differentiate their brands by offering specialized services to both their customers and consumers, while still maintaining cost pressures.

For consumers, it is easy to switch brands. With this in mind, the CPG companies are vulnerable to deals, promotions and new product introductions from competition. A strong brand is a corporate asset that has equity. Strong brands can increase the value of a company. It is more than having a large share in the market. Customer satisfaction and customer loyalty have an impact on the brand equity. These items serve

¹² Standard and Poors, Industry Report, 2002

¹³ Ibid.

¹⁴ Ibid.

to differentiate the product from the competition and help create higher margins. Today, consumers are offered a wide variety of choices and can shop in multiple distributions channels so the strength of a brand is increasingly becoming more important. Competition is also increasing and brand equity is becoming a measurement for senior management

Ultimately, marketing has the responsibility for creating advertising and promoting a brand image for a product that consumers can recognize, appreciate, and be willing to reach for instead of competitive brands in the category. In order to create successful marketing campaigns, it is critical to have purchasing, price and promotion information for a brand category. Point-of-sale information about purchases is available from several sources, such as A. C. Nielsen and Information Resources Inc. (IRI), which not only track market share and overall category performance, but also measure the effectiveness of advertising and promotions.

Effective CPG marketing requires an understanding of the firm's brand performance in the marketplace. In order to understand the marketplace, the brand group needs to analyze point of sale data. For the insights required for target marketing to particular segments of consumers, it is necessary to analyze supermarket scanner-level data. More data and more rapid data access do not automatically translate into better decision making. Brand groups need data mining solutions to transform the information into knowledge for building brand equity.

There has been an ongoing erosion of brand loyalty due in part to CPG manufacturers' efforts to increase market share through the use of coupons, newspaper specials, and product promotions. The consumer has been conditioned to look for specials when purchasing CPG products. Many will wait until a product is on special and then stock up. Others will readily switch to a competitive product if it offers a lower price as long as the products are perceived as equal.

The need to grow brand power globally in the face of ever more competition, such as private label goods, means that CPG companies are reducing brand numbers and focusing more marketing resource on a smaller number of power brands. This means that the need to establish relationships with consumers directly is one of the biggest problems facing CPG companies. As CPG companies are well aware, brand marketing communications is shifting from a model based on intrusive one-way advertisements, directed at largely undifferentiated passive consumers, to a model based on targeted interactive communications with consumers, which deliver a service value to consumers in exchange for their attention and information.

This new model demands complex multi-channel consumer relationship management based on vast databases with a sophisticated business intelligence capability. CPG companies have no 'natural' contact with their consumers (except via the product). They have traditionally depended on advertising and have been heavily dependent on 30-second TV advertisement, but it is becoming less effective with consumers. A new method is needed that will deliver value in exchange for attention & information and be consistent over time, place, subject.

CPG companies want to focus their communication on profitable consumers (and ones that could/would be profitable). Because consumer behavior is so volatile, CPG companies must intimately know consumer buying patterns and demographics. They can then determine the most profitable marketing and merchandising strategies. This knowledge helps maintain consumer loyalty and better manage product/ service assortment, and promotions to improve results and profits. True 1:1 marketing is something that is not achieved overnight. In fact, it is typically a migration from the mass marketing end of the spectrum toward 1:1 marketing over a period of months or even years. Business Intelligence (BI) solutions allow marketing to customers in a differentiated manner based upon some knowledge of those customers and/or their behavior. It is the process of identifying, acquiring, developing and retaining desirable customers.

5.3 Mergers and Acquisitions

After peaking in 1998 with 813 food industry mergers and acquisitions in 1998; then falling to an average low of 512 in 2001, the number of merger and acquisitions in 2002 is expected to remain down in the United States¹⁵ Most of the activity will be seen for very small and regional food companies who lack the capital for a nationwide rollout of their products. Larger food companies with capital would purchase the smaller companies to fill-in product lines and increase market share. A frenzy of mergers and acquisitions hit the food industry beginning in April 2000, when Anglo-Dutch food conglomerate Unilever acquired Slim-Fast and Ben & Jerry's for \$2.3 billion and \$326 million, respectively. Consolidation seems inevitable in the food industry as a result of the retailers consolidating

Food company acquisitions have also been driven by the need to satisfy investors' demands for financial performance. For many food companies, mergers and acquisitions are a means to achieve higher levels of sales and earnings growth that their business fundamentals wouldn't otherwise support. In addition, long-term growth can be enhanced by cost savings — and operating synergies — in manufacturing, product development, marketing, and distribution. Acquisitions can also enable a company to add new product lines with more favorable growth prospects. Significant deals of the past two years are listed below:

Nestlé–Ralston Purina. In December 2001, Swiss food and beverage giant Nestlé S.A. acquired pet food maker Ralston Purina for \$10.3 billion — combining Ralston's dry dog food business with Nestle's wet cat food operations, along with their other pet-related sales.

Tyson-IBP. In September 2001, poultry processor Tyson Foods Inc. acquired beef giant IBP Inc. for \$4.4 billion. The new Tyson Foods, with \$25 billion in revenue, is now the world's leading protein provider with 28% of the U.S. beef market, 23% of the chicken market, and 18% of the pork market.

Sara Lee–Earth grains. In August 2001, Sara Lee Corp. acquired the Earthgrains Co., the second largest fresh bread company in the United States, for \$2.8 billion. In addition to quadrupling the size of Sara Lee's bakery operations to approximately \$3.4 billion in annual sales, Earthgrains brought the company a premier direct-store distribution system to help expand Sara Lee branded product sales.

PepsiCo–Quaker Oats. In August 2001, snack and beverage behemoth PepsiCo Inc. acquired the Quaker Oats Co. for \$13.4 billion. Adding Quaker's Gatorade brand sports drinks to Pepsi's beverage portfolio has made PepsiCo the No.1 noncarbonated beverage company in the United States, with the leading brands in the rapidly growing categories of bottled water, chilled juices, iced teas, and sports drinks. The Quaker snacks business should also benefit from the distribution strength of PepsiCo's Frito-Lay Inc. snacks division.

Unilever-Bestfoods. In October 2000, Unilever acquired Bestfoods Co., the maker of Hellmann's mayonnaise and Skippy peanut butter, for \$24.3 billion. Bestfoods had twice rejected Unilever's takeover overtures and had sought another suitor, making its own overtures to Campbell Soup Co. in an attempt to avoid Unilever's grasp. In the end, Bestfoods extracted a larger bid from Unilever, which may have been its goal from the beginning.

General Mills–Pillsbury. In July 2000, General Mills Inc. agreed to acquire Pillsbury Co. from Diageo plc for \$10.5 billion. Completed in November 2001 after being delayed for several months by the FTC, the merger makes General Mills the third-largest food company in North America and the fifth largest in the world, with annual sales of \$13 billion.

Future M&A Activity

¹⁵ The Food Institute, 2001

Standard & Poor's believes that the pace of food industry consolidation will likely slow in 2002. For one thing, the explosion in merger and acquisition activity over the past two years has reduced the number of attractive acquisition candidates. For another, the number of deep-pocketed acquirers has dwindled, as companies such as Unilever and the Philip Morris are already working to integrate large acquisitions. Management attention appears to be shifting from merger and acquisition activity to business integration programs. The acquiring companies are now focusing on management structures, plant consolidation, and the leveraging of distribution systems. Opportunities for smaller niche acquisitions may still exist, however. We expect to see lots of product portfolio adjustments and brand swapping as companies implement their business strategies and unload minor brands. For instance, consumer products giant Procter & Gamble Co. (P&G) announced in October 2001 plans to sell its Crisco shortening and Jif peanut butter brands to J.M. Smucker Co.

Standard and Poors suggests that, although overall M&A may slow, major companies will continue to seek acquisition opportunities in growth markets. Natural foods is the fastest-growing segment of the food industry, the natural and organic food market has become a prime target for main-stream food manufacturers trying to boost sales growth. Natural food includes conventionally grown crops that are subjected to minimal processing. With consumers' growing interest in foods that promote health and well being, and companies' unceasing search for higher sales growth, acquisitions and investment in the natural food segment are likely to continue.¹⁶ Major packaged food manufacturers such as H.J. Heinz, Kellogg, Kraft, and General Mills have all made investments in natural and organic foods companies.

5.4 Surviving Consolidation

CPG market boundaries have expanded beyond its traditional, regional geographic and product line territory.

Expanding Boundaries

With the trend toward consolidation, the industry is becoming less US centric and more companies must address issues concerning climate, tax regulations, language, and terrain¹⁷.

- ◆ **Coastal Concerns** - Companies located in coastal regions must be concerned with the additional requirements associated with coastal shipping. This includes working with freight forwarders, transferring freight to other carriers, sending containers overseas, and importing and exporting regulations.
- ◆ **Climate Related Issues** - Companies that expand into other regions must be aware of different shipping challenges related to the various climates throughout the different geographies.
- ◆ **Language Needs** - Companies located in areas of the world where a majority of the people speak another primary language must be concerned with the difficulties encountered with translation and miscommunication.
- ◆ **Highway Infrastructure** - Because of the highway system, some areas of a country are better suited for centralized shipping than others. Some countries have well-maintained, easily accessible highway systems. Other areas may have a poorly maintained or sparse highway system.

As companies consolidate and expand to other regional locations, they must plan for the organizational, logistical and technical changes that must occur to support this growth. For example, many companies now operate seven days a week, 24 hours a day. Many companies operate more than one distribution center, which requires that they change both their management policies and technology to move from centralized to decentralized control.

¹⁶ Standard and Poors, Industry Report, 2002

¹⁷ The Food Institute, 2001.

CPG companies are attractive targets for corporate takeovers because they sell profitable, recession-proof products and, as much as any enterprise, are relatively immune to economic fluctuations. CPG products are often perceived as necessities, and consumers are not as apt to quit buying them during economic downturns as they are to stop buying new cars or stereos. Moreover, because CPG companies tend to be highly diversified, the value of their assets often exceeds the value reflected in the price of their stock. This makes it possible for an investment group to buy a CPG company, sell off its various assets, and return to the shareholders a profit greater than that which the present management of the company might be able to guarantee.

To defend themselves against takeovers, CPG companies often merge with other companies or restructure their own internal operations. In the course of merging and restructuring, redundant corporate functions might be eliminated and unprofitable enterprises might be sold. Often, a company in the process of fighting off a takeover claims to be returning to its profitable core business. All the while, however, there is increasing pressure on corporate management and staff to improve the profitability of the company and its products so that shareholders won't be as ready to jump at the stock price offered by the investment group that is trying to acquire the company. Nevertheless, takeovers continue to be attempted and are likely to continue to exert pressure on consumer goods companies.

5.5 Packaging

The final step in the manufacture of CPG Food products is packaging. The selection of packaging materials and containers involves considerations of product compatibility and stability, cost, package safety, solid waste impact, shelf appeal and ease of use.

Environmental issues are impacting packaging selection and creation. According to Standard's and Poors, packaging is the the third largest food production cost, about 8% of each dollar spent on food. Paperboard is 40% of packaging costs

Changing demographics impact the packaging of products. For example, for consumers who are over 65, nutrition and digestibility remain key dietary concerns. Packaging is also important. S&P explains that, "studies show that older consumers prefer packaged food products that are easy to open and have legible labels."¹⁸

5.5 Increased Power of Retailers

"Large consumer products manufacturers prefer to do business with large, sophisticated, customers. At the most basic level, large customers buy more products. More subtly, and perhaps more importantly, these customers tend to offer greater opportunity for integrating their operations and flow of information more closely with [suppliers]. This can create significant opportunities for operational efficiencies and inventory reductions.

As retailers consolidate and gain increasing channel influence, and as the technology improves for moving information from point-of-sale back through the channel, [suppliers] are focusing their sales and development efforts on improving relationships with retailers, the source of consumer behavior and sales activity. Customers will judge how efficiently they move product to the retailer."¹⁹

¹⁸ Standard and Poors, Industry Report, 2002

¹⁹ Pembroke Consulting, 1998.

The installation of in-store scanners helped contribute to a power shift from consumer packaged goods (CPG) manufacturers to retailers because retailers could obtain a wealth of information. The scanners provide retailers with specific information on which products are most profitable in their stores and a clearer picture of the prices at which various products are most profitable. This same information was available to manufacturers, but only on a time-delayed basis. Therefore, the retailer acquired an advantage when negotiating with the manufacturer because the retailer had information that was more detailed and more current than the manufacturer's information. These circumstances, in combination with the explosion in the number of brands and products competing for shelf space, helped bring about the shift in power from the manufacturer to the retailer. In reaction to this, CPG companies have worked to gather information that is as valuable as the retailer information through the development of data mining and market intelligence.

Retailers, on the other hand, have used this new power to alter their role in the marketing and distribution process. Where they once acted simply as purchasers of the products that consumer goods manufacturers offered, they now negotiate for the best possible deals and initiate marketing programs without the manufacturers.

As a result, CPG manufacturers have frequently found themselves paying, either through special deals that shrink product profitability or through contributions to cooperative advertising programs proposed by retailers, for the space in which their products are displayed in retail stores.

Retailers, in some cases, have found it difficult to deal with all of the available data. The typical retailer operates at a relatively low margin of profit and often doesn't have the staff necessary to analyze and react to the increasing amount of store-level data. CPG manufacturers are treating this situation as an opportunity for their sales forces to make consultative sales calls, during which sales personnel "interpret" store-level data for retailers and use this information to demonstrate the profitability of their products.

Integrated supply chain management strategies are being implemented by CPG companies. Excessive production and stocking have all but disappeared throughout the industry. This is due to using the purchase data to reduce the inventory kept in stock. CPG manufacturers have established customer service levels that guarantee delivery of orders within 72 hours at a 95% fill rate and have set 24-hour service as a goal. Customers are demanding this level of service. If a manufacturer cannot deliver an order within these limits, customers either agree to pick up orders themselves or else buy from a manufacturer who can deliver within 72 hours.

Large CPG manufacturers have begun to increase their representatives' presence in the retail industry. For example, Procter & Gamble has set up a team in Bentonville, Arkansas to work exclusively with Wal-Mart. This scenario gives suppliers access to systems enabling them to know what is selling and to plan their production accordingly. Suppliers are also adding services like scheduling shipments that enable in-transit transfers from suppliers' trucks to retailer trucks for distribution to stores.

5.7 Global Supply Chains

Manufacturers have to expand internationally to meet their customer needs. The trend toward globalization involves many CPG companies. There are cross-border operational issues that must be addressed:

- ◆ Border regulations (import/ export fees, paperwork, etc.)
- ◆ Currency
- ◆ Language
- ◆ Tax laws

Through joint-venture relationships, a company can learn from its partner about the unique customs, tastes, and regulatory issues of a market. Once this market knowledge is imparted, many companies acquire their joint-venture partners and build on their businesses through more joint ventures or outright acquisitions.

Exports to Mexican and Latin American markets

With the inception of the North American Free Trade Agreement, exports from the United States to Mexico and Latin America have increased. According to U.S. Customs, the North American Free Trade Agreement (NAFTA) is a comprehensive agreement that came into effect on January 1, 1994, creating the world's largest free trade area. Among its main objectives is the liberalization of trade between Canada, Mexico and the United States to stimulate economic growth and give the NAFTA countries equal access to each other's markets. U.S. exports of processed food to Mexico and Canada have increased since the signing of the North American Free Trade Agreement (NAFTA). Exports are likely to continue to do so, especially given the strong rebound in economic activity in Mexico in recent years.²⁰ Further negotiations on trade agreements with other Western Hemisphere countries — notably Chile, Costa Rica, Brazil, Argentina, Uruguay, and Paraguay — could increase U.S. exports to Latin America.

For additional information on this agreement, please refer to: <http://www.iafis.org>

Introduction of the Euro

In EMEA, there is a move towards a single market with the introduction of the Euro. According to a recent IBM Market Intelligence report, this is leading to increased privatization and deregulation in the marketplace.

Global Expansion

With approximately three-quarters of its profits generated in North America, the U.S. packaged food industry's exposure to developing and emerging markets is below average. This keeps the industry and its investors insulated from the risks of foreign operations and provides a measure of profit protection when economic problems arise in other parts of the world.

However, the processed foods market is becoming more global in response to the maturity of these markets in developed nations. Standard and Poors explains that, "the United States is among the world's leaders in both exporting and importing these products, with total processed food and beverage trade of approximately \$83.5 billion in 2000 (latest available). This predominance will likely continue well into the future, given the appeal of American brand names, the growing influence of U.S. multinational firms abroad, and the leading role that the United States plays in global commerce".²¹

Most of these processed foods, both exports and imports, have been characterized as "minimally processed" rather than "highly processed." Minimally processed products include fresh and frozen meats, frozen fish, soybean oil, and canned fruits and vegetables. Worldwide, the U.S. is dominant in these industries, reflecting the nation's efficiency in field crops and meat and poultry production. Although minimally processed products will continue to account for most exports in coming years, an increasing proportion of U.S. processed food exports will be highly processed brand-name products, like Wrigley chewing gum, Kellogg cereals, and Frito-Lay snacks. The future growth of these products will principally be driven by rising incomes, changing demographics, and the Westernization of eating habits in many developing countries.

U.S. Exports

Growth in the food industry in developed nations depends on the ability to expand through export sales or foreign investment. Export growth can be driven by finding niche markets for specialized products in developed countries, or by exporting a wide range of products to countries where those products aren't available in sufficient quantity or at all.

The U.S. exports processed foods and beverages to nearly every country in the world — more than 230 countries all told, including the 15 nations of the former Soviet Union. According to Standard and Poors, 10 single-country markets usually account for approximately 70% of total U.S. Processed food exports. In fact,

²⁰ Standard and Poors, Industry Report, 2002

²¹ Standard and Poors, Industry Report, 2002

nearly half of U.S. processed foods exports go to three countries: Japan, Canada, and Mexico. Rounding out the top 10 export destinations are Korea, Hong Kong, the United Kingdom, the Netherlands, Taiwan, Russia, and China.

Standard and Poors shares the following statistics about exports:

- Japan is the largest export market for U.S. processed foods, and accounted for 19% of the total in 2000. The vast majority of Japan's imports of U.S. processed foods are from two categories: meatpacking products and frozen fish. Japan also imports large amounts of U.S. frozen fruits and vegetables, prepared feeds, and poultry.
- Canada is the second largest importer of U.S. food, with meatpacking, frozen fish, canned fruits and vegetables, and miscellaneous products (spices, teas, and other food preparations) leading the list of industry goods shipped.
- The third largest importer of U.S. processed foods is Mexico, with meat and poultry products the largest categories. Mexican imports of U.S. processed foods have shown rapid growth in recent years, advancing 66% from 1996 to 2000.
- Western Europe has long served as a major destination for American processed foods; however, trade between the region and the United States hasn't grown much in recent years. Thus, the share of American exports going to Western Europe will probably decline slowly.²²

European and Asian Exports

The mix of countries from which the United States imports food products is more varied than that of its export destinations. Nevertheless, the top 10 sources of imports accounted for 68% of total U.S. Processed food and beverage imports in 2000.

Standard and Poors states:

- Canada is by far the largest supplier, with more than 24% of the U.S. Market. The main U.S. Imports from Canada are from the same two industries that lead U.S. exports to Canada: Canada dominates as a source for U.S. processed food imports. meatpacking and frozen fish. and vegetables
- Mexico exports one-third the amount of Canada. It is the second leading source country for U.S. Processed food imports. The principal products include fish, malt beverages (including beer), and frozen fruits.
- France, Italy, Australia, the Netherlands, the United Kingdom, New Zealand, Thailand, and Brazil round out the top 10.
- Other leading imports in recent years are fish and seafood (Thailand) and wine (France and Italy). Some other important import categories are distilled spirits (the United Kingdom), beer (the Netherlands), coffee and cocoa (Brazil), and meatpacking products (Australia and New Zealand).²³

5.8 Shelf Space

The number of new consumer goods products introduced each year has increased dramatically. Approximately 4,000 new products are introduced annually, of which only 100 will eventually survive. These products are competing for a finite amount of shelf space in the nation's stores. They are competing with other brands as well as the retailer's private label. Private labels have a favored status within stores.

CPG manufacturers find it necessary to use their marketing information to make better business cases for their products. For example, if the manufacturer of a new lotion wants shelf space in a grocery store, its

²² Standard and Poors, Industry Report, 2002

²³ Standard and Poors, Industry Report, 2002

sales force must work with the retailer and convince them that this space could be more profitably occupied by their product than by their competitor's. It is also important to promote the new products in a way that the retailer will be interested in carrying the product. The competition for shelf space has become so intense that retailers ask manufacturers for "slotting allowances". These allowances force the manufacturer to pay the store to stock and display a new product.

5.9 Private Label

Besides the traditional competition from private label or store brands that might provide the retailer with higher profit margins, there has been an explosion of other competitive offerings from the retailers. According to Grocery Manufacturer's of America, "Consumers believe national brand manufacturers are innovators. Eighty-four percent said that store brands 'copy national brands' products. Sixty percent say that store brands look like national brands and thirty-seven percent said that store brands develop new products on their own."²⁴

The relative maturity of the U.S. food marketplace limits companies' pricing flexibility. One of the best ways to enhance pricing power in this crowded market is to develop customer loyalty through brand awareness. Brand loyalty is the holy grail for all U.S. consumer product companies, including those in the packaged food and beverage industries. It's no surprise that these companies are among the nation's leading advertisers. Nevertheless, lower-priced products known as private-label (or "store brand") goods are a constant threat to their branded counterparts.

Private-label sales in supermarkets, in dollar terms and in physical volume, increased steadily from 1995 to 2000. According to the Private Label Manufacturers Association (PLMA), a trade group located in New York, sales of store brands totaled \$47.3 billion in 2000 (latest available), up 2.6% from the prior year. Supermarkets, with \$37.8 billion of those sales, accounted for 79.9% of the total, while mass merchandisers and drug chains accounted for 13.7% and 6.4%, respectively. In supermarkets, private-label goods accounted for approximately 20.0% of all units sold in 2000, compared with 20.1% in 1999. In drug chains, private-label sales accounted for 12.6% of total units sold, versus 13.2% in 1999. For mass merchandisers, private-label sales accounted for 13.1% of total unit sales, up from 12.4% the prior year. The importance of private-label products varies significantly by product category. Substantial inroads have been made in grocery categories that are commodity-oriented. In general, consumers purchase these undifferentiated products based on price more than brand name. Thus, for many years, popular private-label items have included dairy and bakery products and fruit juices.²⁵

5.10 Cuts in Manufacturing Costs

According to **Food Engineering's 2001 Best Manufacturing Practices Survey**, food processors have substantially slashed overall manufacturing costs during the past five years. Survey respondents report major reductions in manufacturing costs, manufacturing cycle time, inventories of both raw materials and finished products, and order lead times -- both in their individual plants and throughout their companies. Although respondents also report improved man-hour productivity and throughput over the same five-year period, these gains are little changed from results reported last year, indicating less year-to-year improvement than in cost reduction.

Respondents were asked to rate the improvements in manufacturing efficiency which their individual plants and companies have achieved over the past five years according to seven basic measures:

- Percentage of *reduction* in manufacturing costs; manufacturing cycle times; inventories (both raw materials and finished products); order lead times; and plant waste.

²⁴ Wwww.gma.com, 2002

²⁵ Standard and Poors, Industry Report, 2002

-
- Percentage of *increase* in man-hour productivity and throughput.

We were rather surprised to find, however, relatively low percentages who measure other key performance indicators (KPIs) such as:

- Conformity to production schedules (53 percent);
- Changeover time (37 percent);
- Cycle-time reduction (21 percent);
- Order lead-time reduction (20 percent).

Those reporting manufacturing cycle-time results show mean improvements of 17.2 percent at plant level and 16.2 percent company-wide -- well up from the mean of 9.7 percent reported in both categories last year. Nearly one-third (32.7 percent) reduced cycle times by 11-20 percent; another third reduced cycle times between 1 and 10 percent.²⁶

The most dramatic improvements, however, show-up in reduced inventories of both raw materials and finished products. Respondents report reducing raw-material inventories by a mean of 16.7 percent at their plants and 18.8 percent companywide as compared to 6.7 and 5.9 percent last year. As shown, most (slightly more than 50 percent) reduced raw-material inventories at both levels between 1 and 10 percent, but nearly one-fifth (19 percent) report reducing raw-material inventories companywide by 40 to 50 percent.²⁷

Finished-goods inventory improvements are somewhat lower, but still well improved over last year by mean percentages of 12.3 percent vs 8.6 percent at plant level, and especially of 14.3 vs 6.7 percent companywide.²⁸

Of the relatively few respondents (20 percent) measuring order lead-time reduction, the mean reduction at plant level tripled to 22 percent as compared to 7 percent last year, and improved companywide from 8 to 13 percent.

As noted above, respondents report improved man-hour productivity and throughput but at lower levels than reported last year, suggesting that most improvements occurred earlier during the five-year period surveyed. Mean man-hour productivity at plant level, for example, was reported up 13.7 percent this year vs 19.6 percent last year; mean improvement in plant throughput at 14.8 percent vs 22 percent in 2000.

Training, equipment and control

Food Engineering also asked respondents to list the factors contributing to their improved manufacturing results. As reported in 2001, improved training, equipment and control ranked as the top three factors, with "improved employee/operator training" cited by 79 percent of our respondents just ahead of "new equipment" at 78 percent. Improved automation and process control ranked third at 72 percent.

Although the same percentage of respondents (42 percent) reported "improved maintenance systems" this year as last, maintenance jumped from seventh to fourth place among the reasons for improved performance. Improved workforce structures, although cited by 41 percent of our respondents both this year and last, moved-up from eighth to fifth place among factors listed. Those citing a "new or renovated plant" fell from 43 to 17 percent, suggesting a decline last year in new projects (to be confirmed or contradicted in April by *FE's* annual "Food Plant Construction Report.")

Only 31 percent of respondents cited "improved manufacturing flexibility" as compared to 53 percent last year, but this reflects the latest five-year period and does not reflect a decline in flexibility.

²⁶ Charles Morris, *Food Engineering*, 2002

²⁷ *Ibid.*

²⁸ *Ibid.*

Integration pause

Although improved automation and process control ranked third among the reasons for improved manufacturing performance, plant-floor integration shows little change from last year, when substantial improvements were reported. Forty-four percent of respondents, for example, report “scattered islands of control” versus 42 percent last year; 8.6 percent report “top to bottom integration” as compared to 8 percent last year.

When asked what types of process controls are installed in their plants, respondents replied as follows: Product Life Cycle (PLC) 68 percent; batch controls, 53 percent; individual microprocessor-based machine controls, 53 percent; maintenance software, 40 percent; material/manufacturing requirements (MRP) software, 28 percent; statistical process control (SPC) software, 14 percent; quality-analysis/laboratory information-management (QA/LIMS) software, 14 percent; ERP software, 9 percent (surprisingly low); Supervisory Control and Data Acquisition (SCADA) 6 percent; predictive control, 5 percent, manufacturing execution systems (MES), 4 percent. The relatively high percentage of individual OEM machine controls seems to account for the relatively high “scattered islands of control.”

When respondents were asked how far up the integration ladder their companies have networked to date, 46 report integration at the device level as compared to 44 percent last year. But respondents seemed confused -- or perhaps we confused them -- when asked about integration with information systems. In response to the same question, 19 percent replied integrating via Internet with customers and suppliers. When later asked how far their companies have gone in managing the supply chain, only 12 percent reported e-commerce integration with customers and suppliers via Internet.

This apparent contradiction may reflect corporate priorities to integrate IT systems with each other rather than with plant systems. According to the Bureau of Economic Analysis, as reported last month by *FE* (Jan., '01), capital investment for IT equipment has surpassed spending for non-IT equipment. Currently, only 5 percent of IT investment is spent on manufacturing execution and asset management.

Incremental improvement in process control is leading to more than incremental improvement in manufacturing flexibility. This year, 66 percent of respondents report “great flexibility” in product type, 54 percent “great flexibility” in product size, and 55 percent “great flexibility” in packaging as compared to last year’s results of 54, 48 and 44 percent respectively. Only 11 percent report “little or no flexibility” in packaging versus 14 percent last year.

Manufacturing efficiency improvements in past five years

(Percent respondents answering each question)

Percent Reduction	None	1-10%	11-20%	21-30%	31-40%	41-50%	50%+	Mean
Manufacturing costs								
By my plant	2.9	52.9	27.9	7.4	7.4	-	-	12.40
By my company	44.4	38.9	16.7	-	-	-	-	15.23
Manufacturing cycle time								
By my plant	7.7	32.7	32.7	15.4	3.8	7.7	-	17.20
By my company	3.2	48.4	35.5	-	6.5	6.5	-	16.20
Inventories: Raw materials								
By my plant	9.8	51.0	19.6	5.9	9.8	-	3.9	16.70
By my company	7.7	53.9	11.6	7.7	-	19.2	-	18.80
Inventories: Finished goods								
By my plant	21.2	45.4	27.3	-	-	6.1	-	12.28
By my company	21.1	36.8	21.1	10.5	-	10.5	-	14.33
Order lead times								
By my plant	13.7	45.1	13.7	3.9	3.9	11.8	7.8	21.70
By my company	42.9	33.3	4.8	-	-	19.0	-	13.10
Plant waste								
By my plant	5.6	63.4	19.7	2.8	-	5.6	2.8	12.39
By my company	3.	81.3	12.5	-	3.1	-	-	6.77
Percent								
Increase	None	1-10%	11-20%	21-30%	31-40%	41-50%	50%+	Mean
Man-hour productivity								
By my plant	5.5	52.1	23.3	16.4	-	-	2.7	13.70
By my company	5.5	51.4	18.9	10.8	8.1	5.5	-	16.53
Throughput (volume)								
By my plant	2.6	53.9	17.1	19.7	6.6	-	-	14.80

By my company - 45.9 27.0 10.8 13.5 - 2.7 19.22

Source: *Food Engineering*

5.11 Regulatory Issues

Food wholesale is a heavily regulated industry in the United States. Several organizations establish and monitor the rules and regulations across the industry:

- ◆ Food and Drug Administration (FDA)
- ◆ United States Department of Agriculture (USDA)
- ◆ Occupational Safety and Health Administration (OSHA)
- ◆ U.S. Department of Transportation
- ◆ U.S. Customs Service
- ◆ U.S. International Trade Commission
- ◆ Environmental Protection Agency
- ◆ European Commission
- ◆ Asia Pacific Occupational Safety and Health Organization (APOSHO)
- ◆ United States - Asia Environmental Partnership (US-AEP)

The Food and Drug Administration (FDA)

According to www.fda.gov, The Food and Drug Administration ensures the safety and wholesomeness of almost 80 percent of the United States food supply, all foods except meat, poultry and some egg products, which are regulated by the U.S. Department of Agriculture. Like the food industry overall, the FDA faces changing consumer tastes and new environmental challenges.

Americans today eat a greater variety of imported foods than before, and they rely more on commercially prepared food products. As well, the number of senior Americans continues to grow, increasing the proportion of the U.S. population considered at risk for developing a foodborne illness to 25 percent. Finally, current terrorist threats include potential contamination of the U.S. food supply.

The FDA and other federal, state and local authorities have greatly strengthened the safety of the U.S. food supply. Several food safety initiatives include:

- ◆ Launching new programs to improve the safety of seafood, fresh fruits and vegetables, sprouts, juice and eggs; focusing its field inspection program on products at “high risk” for microbiological contamination;
- ◆ Developing new methods of monitoring the mushrooming food imports; and
- ◆ Tailoring its research, risk assessment and education activities to be responsive to today’s food safety needs.

United States Department of Agriculture (USDA)

The USDA is responsible for the regulation of all meat, poultry and egg products. The Food Safety and Inspection Service (FSIS) protects consumers by ensuring that meat, poultry, and egg products are safe, wholesome, and accurately labeled. FSIS sets public health performance standards for food safety. It inspects and regulates all raw and processed meat and poultry products, and egg products sold in interstate

and foreign commerce, including imported products. FSIS is implementing a strategy for change to reduce the incidence of foodborne illness attributable to meat, poultry, and egg products.

Occupational Safety and Health Administration (OSHA)

OSHA's main mission is to ensure safe and healthful workplaces in America. According to their Internet site, since the agency was created in 1971, workplace fatalities have been cut in half and occupational injury and illness rates have declined 40 percent. At the same time, U.S. employment has doubled from 56 million workers at 3.5 million worksites to 111 million workers at 7 million sites.

United States Department of Transportation (DOT)

The DOT states in its mission that it is to "Serve the United States by ensuring a fast, safe, efficient, accessible and convenient transportation system that meets our vital national interests and enhances the quality of life of the American people, today and into the future." The Office of the Secretary (OST) oversees the creation of national transportation policy and promotes intermodal transportation. Other responsibilities range from negotiation and implementation of international transportation agreements, assuring the fitness of transportation systems, issuing regulations to prevent alcohol and illegal drug use in transportation systems and preparing transportation legislation.

United States Customs Service

U.S. Customs is the primary enforcement agency patrolling the nation's borders. To the importer, the Customs Service provides advice, protection and control of products entering the United States. Their labs continually check imports to ensure they comply with the laws involving public safety, health and intellectual capital.

United States International Trade Commission (USITC)

The USITC regulates tariffs on imports by SIC code. The USITC is also responsible for maintaining normal trade relations with foreign countries.

Environmental Protection Agency (EPA)

The EPA provides leadership in the nation's environmental science, research, education and assessment efforts. EPA works closely with other federal agencies, state and local governments, and Indian tribes to develop and enforce regulations under existing environmental laws. EPA is responsible for researching and setting national standards for a variety of environmental programs and delegates to states and tribes responsibility for issuing permits, and monitoring and enforcing compliance. Where national standards are not met, EPA can issue sanctions and take other steps to assist the states and tribes in reaching the desired levels of environmental quality. The Agency also works with industries and all levels of government in a wide variety of voluntary pollution prevention programs and energy conservation efforts.

The environment is a major concern of leading CPG companies. The detergent industry was first confronted on environmental issues when it released foam into rivers in the US. The foam was not breaking down fast enough. According to the International Association of Soaps, Detergents and Maintenance Products, this incident "led the industry both to fully appreciate the importance of the environment and to invest heavily in environmental research." As a result the industry has been able to develop products with greater margins of environmental safety, as well as, make major contributions to the development of the environmental sciences.

European Commission

The European Commission operates at the very heart of the European Union. The Commission proposes new laws, represents the EU members and acts as the EU guardian of Treaties. Its main concern is to defend the interests of Europe's citizens. The 20 members of the Commission are drawn from the 15 EU countries, but they each swear an oath of independence, distancing themselves from partisan influence from any source.

The Commission's job is to ensure that the European Union can attain its goal of an ever-closer union of its members. One of its main goals is to secure the free movement of goods, services, capital and persons throughout the territory of the Union. The Commission also regulates that the benefits of integration are balanced between countries and regions, between business and consumers and between different categories of citizens.

Asia Pacific Occupational Safety and Health Organization (AOSHO)

The objective of AOSHO is to promote mutual understanding and cooperation among the communities in the Asia-Pacific region as well as to contribute to the enhancement of occupational safety and health in these communities through the exchange of information and views. For a full list of its members and their policies, please review: <http://www.aosho.org/about/about03.htm>

United States - Asia Environmental Partnership

The U.S. has partnered with Asian organizations and agencies to identify areas for improved policies, laws and enforcement through collaboration of ideas regarding the environment through reviewing policies and organizing teleconferences.

For additional information regarding Asian countries and their financial regulations, please review: <http://www.financewise.com/public/edit/asia/links/as-govt.htm>

6.0 e-business in CPG - Food Manufacturing

e-business is still a top priority of CPG companies. Overall, current priorities for CPG companies are based on infrastructure and internal operational efficiency. The focus has definitely shifted from B2C to B2B and B2E, the principles of e-business are planted in the minds of executives in the CPG industry. Although B2C initiatives may be slowing down, it will still retain an important role in the CPG arena. CPG companies are taking a conservative approach to B2C with CPG marketing and purchasing organizations driving usage. B2C enables closer ties to consumers through e-mail interaction, providing product information and allowing for market research. Large CPG companies will work on their B2B initiatives with large customers. This will set the baseline for B2B in the industry. B2E initiatives will provide operational efficiencies for CPGs and create a collaborative environment. Mobile commerce is still being evaluated. As it evolves, CPG companies will integrate successful initiatives.

Electronic Business - A Solution, Not A Salvation

A recent study by the Gartner Group warns that companies must continue to exercise sound business judgment regarding electronic business solutions. The research firm predicts that three-quarters of all e-business projects will fail due to a lack of understanding of the technology and/or poor business planning. The study further says e-business projects will fail if they are viewed as an end in themselves rather than as a vehicle for improving the overall business results. According to F. Barry Lawrence of Texas A&M University, "Since the promise of electronic commerce grows almost daily as more and more opportunities are uncovered, then it is likely that the sole remaining way...to distinguish themselves will be through services like logistics. Logistics and operations are information driven." e-business could be considered a competitive advantage by its users. The information it compiles and uses on customers, products and trends should be used to benefit the food manufacturer.

Electronic Business - "Exchange Models" versus "Point-to-Point Models"

As the Internet continues to grow and expand, the opportunities for business-to-business e-commerce and new types of business models are emerging. Typically there are two main types of e-commerce models that affect distributors:

Point-to-point are proprietary e-commerce approaches that support a direct communication between trading partners (manufacturer to customer and/or distributor to customer). They support established relationships by providing a convenient web site for transacting business by posting customized catalogs and order guides, facilitating the transmission of purchase orders, acknowledgments, invoices and other communications between buyers and sellers. They may combine EDI, XML, or even proprietary file formats as the method of communicating business transactions. Properly executed, they also allow customers real-time access to key information, such as stock status, order tracking and credit information.

Exchanges are electronic marketplaces that support a multitude of relationships. Many such sites have sprung up, nearly overnight, focusing upon specific industries and frequently claiming to offer users the opportunity to significantly lower their costs by putting their needs "up for bid". Buyers post their requirements on-line and sellers respond to those requests with their prices, creating a "reverse auction". Sellers also post products with asking prices, frequently as a means of disposing of surplus inventories. The exchanges offer search engines that users can access to scan all offerings within a specified category of product and review prices.

There are several forces driving e-business in the CPG marketplace. Through e-business, CPG companies will leverage their marketing strength to work with retailers on direct marketing via their loyalty program data. This will become the norm. As part of this work, CPG companies will link their web sites to retailer loyalty and Point-of-Sale data to link the two together where consumer visits to CPG sites equal rewards seen at their store's checkout. It has also been stated that CPG Loyalty Programs will become prevalent but will be more successful than retailer programs. They will link with other, noncompetitive companies to create "Super-Cards." Due to the size and power of retailers, CPG manufacturers will begin delivering product in exact retailer requirements. This includes product size, dimensions, case packs, inner pack configurations and pallet configurations. Eventually, all retailers will demand unique capabilities as they seek to differentiate themselves versus ever increasingly tough competition. CPG companies will also develop Internet-only brands in Soap and Paper categories. They will establish a "chic-status" with consumers and will create an explosion of e-brands. CPG companies will also create their own Internet-only brands to replace some of their older, dying brands.

Several CPG companies are asking:

- How can the Internet further my business objectives?
- Which companies in our industry -- or outside of it -- will use the Net to reach customers with breakthrough marketing techniques or the most compelling new offerings?
- What products and services will we offer and deliver on the Internet? How do I incorporate the Web into existing lines of business and existing channels of distribution?
- What new markets should I pursue?
- How can I innovatively create and package new products?
- How can I improve customer service and satisfaction in order to improve customer retention and profitability?
- How can I reduce design and development costs, procurement costs, improve employee productivity?
- How can I leverage the knowledge within my company?

CPG companies are looking to answer these questions using e-business by cutting bottom line expenses, through a lower cost of ownership, creating higher efficiencies and process improvements, as well as, fueling top line growth by helping companies move faster, embracing new markets, and bringing out the creativity in their organizations.

CPG companies are looking to achieve e-business benefits through:

- Improving operational efficiencies through on-line procurement, inventory management, forecasting
- Improving customer access, service delivery and intimacy through e-commerce, e-care for customers and self service Web sites
- Improving product and service innovation by Virtual co-location and collaborative engineering with suppliers
- Strengthening brand recognition and company image in the marketplace by enhancing brand through upbeat, quality web presence
- Developing new products, services and/or business by bundling new services with existing products, create new businesses

Learnings from other industries and companies show that e-business is pervasive, provides competitive advantage and moves quickly. Some examples include:

- Digitizing brands and marketing directly to consumers using the web
- CO-branding and "CO-sighting" with other businesses using the Internet
- Electronic exchange of product information with retailers (viaLink Company)
 - Actual sales information by brand and product line
 - Product marketing information

-
- End consumer frequent shopper information
 - Using e-Procurement to reduce inventory, cost and production time
 - Replacement of EDI with web based applications
 - Collaborative planning and forecasting to link the entire supply chain
 - Web-based VMI (Vendor Managed Inventory) to respond to customer's needs

Key entry points which CPG companies are targeting for e-business include:

SCM Process Management

- Logistics Planning
- Replenishment
- Vendor Managed Inventory (VMI)
- Payment
- Sourcing

CRM Process Management

- Order Management
- Inventory
- Customer Service Automation
- Field Service Automation
- Payment Processing
- Order Fulfillment
- Content Management

Buy-Side

- Supplier Management
- Procurement
- EDI/Web EDI
- Integrated Supply Chain
- Forecasting
- Performance Management
- Partner Communications

Enterprise Enablement

- Knowledge Mgmt
- e-Learning
- e-HR (self serve)
- Strategic Planning
- Research & Development
- Product Management
- Brand Management
- Business Reporting

Sell-Side

- Web Store (B2C)
- e-Marketplace
- e-Catalog (B2B)
- Retail/Distribution Extranet
- e-Marketing
- Customer Service
- e-Bill Present/Pay
- Loyalty Programs

Leading companies are also using Web technology to provide information and services to internal and external customers. Some examples are:

- e-Care for Customers: Automated categorization, routing and answering millions of e-mails received annually; providing increased responsiveness to customers.
- e-Care for Employees: Company web sites create to share, distribute and reuse intellectual capital; HR sites to provide services on personnel records, insurance, health benefits, stock programs, etc.
- e-Care for Business Partners: Web-enabled partner information allows business partners worldwide access to product and marketing information in multiple languages. Partners can check supply status, purchase products, track and order products, check prices, etc.
- e-Care for Influencers: Tailored web sites for financial analysts, shareholders, potential employees, etc.; Press room for the media.

CPG companies are using e-business as a tool to enhance their relationship with customers and suppliers. Food companies have also targeted logistics and supply chain costs as areas for potential improvement. A number of business-to-business (B2B) electronic marketplaces have been launched in the food and beverage industries to aid these efforts. These marketplaces employ software systems that allow buyers and sellers of similar goods to carry out procurement activities over the Internet. Their existence may help companies streamline business transactions with their suppliers, buyers, and distributors. B2B electronic marketplaces have the potential to create significant efficiencies in the food industries. For example, they could reduce transaction costs, generate volume-related scale economies by combining orders from multiple purchasers, improve inventory management, and facilitate bidding by a broad spectrum of potential suppliers. Given the mature state of the U.S. Food industry and expectations for low levels of food price inflation, we expect that realignment and cost-cutting activities will remain a major focus within the industry.²⁹

e-Manufacturing

According to Charles Morris, Senior Editor for *Food Engineering*, "e-Manufacturing can integrate plant control systems with the rest of the enterprise to share real-time information, cut costs, boost productivity and improve product quality. Only recently has management recognized that the plant floor must tightly integrate with suppliers on the buy side and customers, carriers and distributors on the sell side if the plant is to manufacture to order rather than to inventory -- if it is to know what to produce, when to produce it, for whom to produce it, and where to ship it to achieve ECR -- to get the right product to the right place in the right quantity at the right time."³⁰

The advent of the Internet, however, combined with emerging industry standards make information exchange possible between supplier, plant and customer without custom integrations. Emerging standards such as XML (Extensible Markup Language); the S-95 standard (published by the Instrumentation, Systems & Automation Society (ISA) for integrating the plant floor with upper-level business systems); and the Uniform Code Council's *UCCnet* for electronic trading are making e-business possible for food manufacturers.

The manufacturing plant is still the place where value is created. Tightly-integrated supply-chain models are emerging where connection of the plant floor to the broader supply chain is essential, and information access -- the right data to make informed business decisions -- is more critical than ever before. The Internet has accelerated this trend.³¹

November 2000, *Food Engineering* reported on three manufacturers -- J. R. Simplot, Basic American Foods and Owens Tennessee Pride -- that take a plant-centric approach to supply-chain integration. Kraft, too, is taking a plant-centric approach, as reported last May by *FE*. Kevin Prouty, research director for

²⁹ Standard and Poors, Industry Report, 2002

³⁰ Charles Morris, *Food Engineering*, 2002

³¹ Charles Morris, *Food Engineering*, 2002

manufacturing strategies at AMR Research, concurs with this approach. "All the data comes out of the plant," he points out.

The plant floor is the starting point for greater information connectivity. Computerized process-control systems generate a wealth of information about productivity, process and product design, product quality and delivery. "A contemporary automation architecture is the key to unleashing this information in a cost-effective manner," says Rockwell Automation in a White Paper entitled *Making Sense of e-Manufacturing: A Roadmap for Manufacturers*.

AMR Research defines e-Manufacturing as simply "the intersection of information technology and manufacturing." e-Manufacturing means real-time ERP connectivity; asset management of people, products and processes; and seamless connectivity to the entire supply chain via the Web, adds Rockwell.

For the plant manager or engineer, e-Manufacturing can seamlessly integrate the plant's control systems with the rest of the enterprise to cut costs, boost productivity and improve product quality. For the manufacturing manager, e-Manufacturing can apply the Internet to operations for transparency, responsiveness and to communicate best practices, boosting plant efficiencies in any number of locations worldwide. For the CFO or IT manager, e-Manufacturing opens new information from the plant floor which can be used to generate new opportunities and shared worldwide via Internet.

In the traditional supply chain, the plant was only loosely coupled with suppliers to avoid supply shortages, and with customers to avoid demand fluctuations. Plants thus inventoried supplies and manufactured to inventory rather than to consumer demand. Processes were optimized for long production runs so maintenance was reactive, i.e. "don't fix it 'til it breaks."

This is changing. Retailer consolidation, manufacturer mergers and acquisitions, more sophisticated consumers demanding more personalized products, and the Internet itself are creating a faster-moving, more competitive marketplace to drive e-Manufacturing. e-Manufacturing allows rapid deployment of assets, manufacturing to order rather than to inventory, optimized yields, 24/7 operations and supply-chain integration.

e-Procurement

The e-commerce supply chain starts with integrating suppliers to meet the manufacturing schedule of the plant. Plants are integrating with suppliers via Internet exchanges to cut costs and speed procurement of their raw material, ingredient, packaging material and MRO (maintenance, repair, operations) needs.

Transora is a standards-based B2B marketplace that was established in July 2000. It is backed with more than \$250 million invested by 54 major consumer-products companies, of which 40 are food/beverage manufacturers including heavyweights Nestle, Kraft, Unilever, Anheuser-Busch and Coca-Cola.

One successful food-industry exchange is Foodtrader.com, a privately-held global B2B marketplace on-line since April '97 for buying and selling agricultural products and ingredients. Foodtrader serves more than 13,000 customers in 180 countries and in June 2001 was named among *Forbes Magazine's* "Best of the Web" B2B firms.

Another exchange with a track record is ecFood, on-line for ingredient purchasing since June '99 and also rated by *Forbes* among the "Best of the Web." ecFood's services include sourcing, procurement, auctions and demand aggregations. By aggregating demand from several buyers, ecFood can cut costs for each buyer, giving smaller food manufacturers the purchasing clout of big companies. Examples:

- A recent ecFood auction yielded sweetener savings of six percent for several dairy firms, including Byrne Dairy, Inc. "Online purchasing is new to us," said President William Byrne. "I will continue to use the service because of the cost savings."

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- For canner Furman Foods, an ecFood auction saved 15 percent on one bean transaction, 3 percent on a second. "We're planning additional transactions," said Paul Dubendorf, vice-president of finance.
 - For Pillsbury, ecFood has conducted auctions for ingredients, freight services and MRO items.

e-Commerce Integration

Early efforts to achieve ECR (Efficient Consumer Response) bogged-down because the plant wasn't considered in the supply chain, and because manufacturers and retailers could not satisfactorily integrate their Electronic Data Interchange (EDI) systems. Legacy systems required customized, costly one-to-one solutions, discouraging integration. "EDI solutions have not addressed this integration concern," says the Uniform Code Council in its October, 2000 *UCCnet White Paper*, which introduces a business model for global electronic trading.

UCCnet addresses industry-wide standards through XML technologies and business-process models defined by the current trading community, says UCC. Standards make it easier for partners to integrate their existing IT infrastructure with UCCnet.

Released Summer 2001, UCCnet is the first industry-supported standards-based infrastructure devoted to the food retail market, says UCC. The objective of the base release is to synchronize data from manufacturers, distributors, brokers and retailers so B2B services can follow. Pilot programs include scan-based trading and vendor-managed inventories. In the future, UCCnet envisions exchanging pricing, direct-store delivery (DSD), private label, imaging and nutrition information, and offering auction or negotiation capabilities.

Success stories include:

Arcor - Argentina

Arcor is a leading company in the food industry, known primarily for candies and chocolates. It is the number one world wide candies manufacturer and a major exporter in Argentina and Mercosur. With 34 industrial plants in Latin America, it exports a wide range of products to more than 80 countries all over the world, making it the Argentinian company with the most important presence abroad. Arcor's current strategy includes strengthening its international business in all 80 countries.

The focus of this solution is to create an electronic solution that will increase sales, identify potential customers, enhance customer service and reduce operating costs for its international sales. Arcor did not have an electronic solution before implementing this solution. The customer's goal is to be the first Consumer Package Goods with this type of solution.

The breadth of Arcor's objective led IBM to propose a consulting engagement integrated with the development of the first phase of the project. IBM Global Services - Business Innovation Services (BIS) assisted Arcor in identifying its specific business needs, then carried out the development and deployment of the solution, called Arcorsales, using WebSphere Commerce Suite Advanced Edition V3.02 and AS/400 Model 720 servers.

Arcor and BIS developed a Business to Business (B2B) site where Arcor's customers can access a catalog in either English or Spanish. The catalog includes four types of products: confectionary, chocolates, food products and flour products. The site also allows Arcor customers to ask for quotations and view price lists, historic quotations and samples, account status, transaction reports, pending invoices, shipping plans and proforma invoices. The site also includes an incentive program where customers can view points earned and prizes available. IBM's B2B solution will allow Arcor to do the following:

- Increase international sales

-
- Establish new relationships worldwide
 - Enhance customer service
 - Decrease operational costs.

In the first four months, Arcor sold 400 thousand kg of confectionaries to five continents. Arcor's IBM solution has allowed the company to "go global." By partnering with IBM and Telecom, Arcor truly has the opportunity to be a major player on the world stage.

Arena Holding - Italy

Arena Holding is a leader in the Italian market of food production and distribution. Arena Holding S.p.A. is located in Bojano in the southern tip of Italy. The Arena group's revenue is about US\$250 million dollars and it employs about 2,000 people. It distributes more than 500 types of products from four production sites. Its portfolio includes Arena Fresco (chicken), Salumi Marsilli, Mozzarella Roccaverde, Arena Surgelati (pre-cooked vegetables), MarePronto (high quality fish), Brina and Francesco Alliata XIV Duca di Salaparuta (ice creams).

The Arena Holding Group needed a wireless solution to support 100 mobile salespeople during their daily activities away from the office. The solution needed to give the salespeople many capabilities, including the capabilities to search a product catalog, to see customer information and profiles, to consider the price list associated with a particular customer profile and to compose product orders by using tools hosted on PocketPC devices.

The customer signed a contract with IBM Global Services - Business Innovation Services (BIS) to realize the first release of a Wireless Sales Force Automation (SFA) solution based on Java and IBM DB2 for the PocketPC 2002 platform. The solution will be integrated with three different backend Enterprise Resource Planning (ERP) systems, including SAP, JD Edwards and a custom ERP solution. This approach provides an interesting example of how wireless can be seen as a sort of "integration" tool for a company. In this case, the customer is starting to integrate some of its business processes (that is the SFA tools) starting from the front end and anticipating back end integration, which will take time.

BIS implemented a Wireless e-business solution consisting of a client application written in Java running on a PDA system with PocketPC operating systems, such as Compaq IPAQ, Siemens SX45 or Intermec 720. The wireless solution has integrated barcode reading functions and GPRS data transmission capabilities. The client application uses a local database on the device, which replicates information from the ERP system by using IBM DB2 Everyplace and specific ERP connectors. The solution is based on a multi-tier architecture. In the offline mode, an intermediate replication server receives data from the ERP system and transfers it to the PDA devices by using a synchronization system based on IBM DB2 Everyplace and IBM DB2 Sync Server.

Arena is expecting to increase both the quality and the quantity of sales activities, due to this IBM wireless solution. In particular, Arena is planning to enlarge and streamline the portfolio currently available with the aim to increase its revenue and reduce costs.

BIS performed an initial and indicative analysis on the basis of data supplied by Arena, then complemented that data with additional hypotheses from IBM concerning the return on investment (ROI). Of course, all of these numbers have to be confirmed after an adequate production period is monitored and, for the moment, they have to be considered estimates. Additionally, the analysis takes into consideration only the ROI effect on Arena's revenues; many other factors such as increased productivity and cost reduction may reasonably increase the final ROI value as well. The following is an explanation of the proposed initial ROI elements:

About 80 percent of the company revenue, corresponding to about US\$200 million, is based on the production and distribution of "fresh" food, which includes products that have to be consumed within two days. It is important for these products to be sold as soon as possible, otherwise the selling price of these products decreases considerably (approximately 20-30 percent) with respect to its original value.

By introducing the Wireless SFA, Arena has real-time information available at the headquarters, which enables the company to refine its production level strategy by obtaining a reduction of the unsold food at the correct time. If the

level of the fresh food not sold at the correct time is reduced by just one percent (for the moment this is the IBM hypothesis) with respect of the total costs, Arena will save about US\$2 million, which will increase Arena's net return by nearly US\$400-600 thousand. Thus, from an investment of US\$100 thousand for mobilizing the 100 sales agents with Wireless connections, in just a year, Arena will have a return of approximately four to six times the original investment.

Brach's - United States

Brach's is a quality candy manufacturer with plants located in the US and Mexico. Its primary products are loose candies sold in supermarkets and discount chains. The company produces more than 2,000 kinds of candy, mostly under the Brach and Brock brand names (it acquired Brock Candy Co. in 1994), but also under licensed names including Hi-C, Froot Loops fruit snacks and Smucker's jellybeans.

Brach's was running SAP on an expensive Hewlett-Packard (HP) platform with Informix as the database. The HP servers had been sized to support significant growth which did not materialize. As Brach's was nearing the end of its lease with HP, it decided to look for a way to reduce its server resources. The company decided to move away from HP, as it had experienced numerous outages and less than acceptable service with the HP equipment

Brach's engaged the IBM SAP competency center to determine sizing for its new hardware solution, and asked the IT Infrastructure team of IBM Global Services - Business Innovation Services (BIS) to determine whether migration was possible within an acceptable time period. BIS and the competency center made a significant effort to accurately size Brach's' needs, using the current environment, tools at the competency center and competitive benchmarks to determine the best fit for the customer.

This solution has had a significant impact on Brach's' IT budget, reducing monthly payments by approximately half. BIS was able to demonstrate the strength and reliability of the pSeries servers before the actual migration took place, so Brach's is confident that the solution will meet its requirements with ease.

Danone - Brazil

With over 86,000 employees in 120 countries, the Danone Group leads the world food industry by providing fresh dairy foods, cereal biscuits and bottled water. Danone approaches the world with respect for diversity of cultures, deeply rooted in solid, fundamental values. Around the globe, Danone represents healthy eating, well-being, quality and good times shared with family and friends. Its dynamic incorporates a people-oriented consideration of the culinary preferences and habits that define cultures, right down to the details of everyday life. Danone constantly adapts to the expectations of its consumers with enthusiastic innovations, providing premium-quality food and beverage products.

With three plants producing different products in separate cities, Danone needed to centralize operations at its headquarters in Sao Paolo in order to improve the company's chain management processes. Danone had different systems in each location, where communications were made by FTP files, and the end users needed to send files to the main site. Its problems were outdated information and the outdated systems themselves, which resulted in errors and lost information.

Danone still exchanges a lot of File Server files, but it is starting a new SAP project, which will revolutionize its entire IT environment. Data from Office Automation, Progress Database and Lotus Notes Database is currently being stored on the ESS. Danone has about 600 users accessing this data by a long distance network.

Although there are no quantifiable benefits to report at this time, Danone cited the following benefits as a result of the recent ESS implementation:

- More information security
- Faster system for business communications and supply chain management
- More accurate, timely information and decreased amount of lost information
- Faster information exchange for improved collaboration and smoother remote management of three locations
- Scalable for future growth.

Danone agrees that the most valuable business benefit was the better control of system management. In addition, Danone has identified positive impact based on the system's scalability, performance and cost reductions.

Soglowek

Founded 60 years ago, Soglowek now is a dynamic vertically integrated food processing company with 1,200 employees. Soglowek exports its expanding product line, which includes hamburgers, kebabs, cocktail franks wrapped in pastry, vegetable patties, stuffed chickens and meat strudels, to five continents. State-of-the-art manufacturing facilities and a total commitment to quality make Soglowek's products some of the tastiest and healthiest around. A sure sign of quality is the fact that Burger King chose Soglowek as its exclusive meat supplier in Israel.

Since the customer faced a huge business expansion that its old Compaq infrastructure wouldn't be able to support, Soglowek needed a new locally managed storage solution. Soglowek needed a scalable solution that could adjust to business expansion and achieve better overall system performance. Currently, the IBM solution has 100 internal users at Soglowek. All of the customer's core manufacturing and sales data is consolidated on the central storage/SAN that ITS installed.

The overall IBM solution saved the customer both time and money. By using IBM as a one-stop-shop for all of its needs, Soglowek reduced the time and money that it would have taken to implement the solution using different vendors. The customer's system management costs also were reduced by 50 percent due to the centralized storage solution. By utilizing central storage, Soglowek reduced raid management total cost of ownership as well, since the customer doesn't need to manage each server raid individually.

Tip-Top Ice Cream - New Zealand

Headquartered in Auckland, New Zealand, with branches in Christchurch and Wellington, Tip Top Ice Cream leads the way with a 70 percent share of the country's ice cream market and U.S.\$63 million in annual revenues. Finding its frozen tubs and novelty products is easy--the company has 8,000 retail customers countrywide, from corner stores to supermarkets.

At Tip Top, making ice cream is considered a craft, where employees faithfully document every business and manufacturing process and every product specification. Unfortunately, until recently, their system for managing this information was quite cumbersome. Employees typed up processes in Microsoft Word documents and saved them on a shared server for colleagues to access. Anyone needing to make a change saved a working copy of the document on their own hard drives, e-mailing their colleagues to let them know a particular document was checked out. But this resulted in multiple versions of the same files floating around, and employees were unsure if they had the latest versions.

Tip Top shared its concerns with its majority shareholder, Kiwi Co-operative Dairies, a leading New Zealand dairy product manufacturer and distributor. Kiwi, a Lotus Notes shop, supported Tip Top in moving to Lotus Notes from Microsoft Exchange Server for its e-mail, calendaring and groupware functions. This was a start, but didn't solve the

entire proble.m

Tip Top envisioned providing access to its knowledge stores over Web browsers so its employees could retrieve information wherever they happened to be. Around this time, Tip Top's IT manager attended a demonstration of Lotus K-station, now part of the WebSphere Portal Family and was immediately sold on the knowledge-sharing portal technology. Although it already had a collaborative culture, Tip Top Ice Cream is just getting started with knowledge management technology. Currently, about 200 of its 450 employees log into the portal daily, gaining access to company news, messages from the CEO, e-mail and calendars.

By year's end, Tip Top and Infinity Group will have integrated Lotus Domino.Doc and Lotus Workflow into its portal. That's when the company expects to generate substantial business benefits, since these solutions will provide an automated system for storing, tracking and sharing documentation pertaining to business/manufacturing processes and product specifications.

Benefits include:

- Streamlined knowledge-sharing processes to increase workforce productivity and enhance documentation accuracy for 200 users
- Enhanced efficiency in sharing best practices;
- Easier compliance with regulatory standards;
- Anticipated reduction in search times for business/manufacturing documentation, as well as increased document accuracy

7.0 IT Spending

This section will review typical IT Spending at CPG companies.

- The WW CPG Industry total IT opportunity total (IT Core) for 1000+ CPG manufacturer spending for 2001 is \$6.6 billion. This represents 1.8% of total 1000+ Opportunity for all industries (12/99 GMV was 1.8%) and 6.7% of the total Distribution Sector 1000+ opportunity (\$98.6B). This is an net increase of 0.1% over the 12/99 GMV.
- The CPG Industry 1000+ Opportunity represents 36% of the total CPG Vertical Market opportunity (\$18.1B).
- The WW CPG Industry total IT opportunity total (IT Core) for 100-999 CPG manufacturer spending for 2001 is \$4.5 billion. This represents 3.2% of total 100-999 Opportunity for all industries and 8.7% of the total Distribution Sector 100-999 opportunity (\$51.9B).
- The CPG Industry 100-999 Opportunity represents 25% of the total CPG Vertical Market opportunity (\$18.1B).
- In 2001, the WW 1000+ CPG opportunity is projected to grow by 7.7% from 2000. It is projected to grow at a rate of 9.0% from 2000-2004. The America's opportunity is projected to grow 8.5% YTY in 2000 (up from 7.0% in 1999); EMEA is expected to grow 8.9% YTY (down from 3.4%) and AP's projected growth is 5.1% (down from 15.1% in 1999).
- In 2001, the WW 100-999 CPG opportunity is projected to grow by 8.3% from 2000. It is projected to grow at a rate of 10.1% from 2000-2004. The America's opportunity is projected to grow 9.5% YTY in 2000 (up from 6.4% in 1999); EMEA is expected to grow 9.2% YTY (up from 2.7%) and AP's projected growth is 5.0% (down from 16.7% in 1999).
- In 2001, the component breakdown of 1000+ CPG IT spending is:

-
- WW: Hardware (30%), Software (21%) and Services (49%)
 - Americas: Hardware (28%), Software (22%) and Services (50%)
 - EMEA: Hardware (28%), Software (25%) and Services (47%)
 - AP: Hardware (35%), Software (15%) and Services (50%)
- In 2001, the component breakdown of 100-999 CPG IT spending is:
 - WW: Hardware (31%), Software (21%) and Services (48%)
 - Americas: Hardware (28%), Software (19%) and Services (53%)
 - EMEA: Hardware (27%), Software (23%) and Services (50%)
 - AP: Hardware (42%), Software (19%) and Services (39%)
 - Technology spending is expected to be the fastest area of hardware growth by 2004, with 7.1% growth in the 1000+ market and 11.1% in the 100-999 market, CAGR 2000-2004.
 - Software is the second fastest growing category (behind Services) within GMV with a projected CAGR of 9.0% from 2000-2004. In 2001, software represents 21% of the total IT spending among 1000+ CPG manufacturers worldwide. Software in EMEA for 2001 is predicted to account for 25% of total IT budgets, with growth of 11.0% between 2000 and 2001.
 - Services is both largest area of spending among WW large CPG manufacturers and the fastest growing (11.2% CAGR 2000-2004). By 2004, 52% of IT spending WW will be dedicated to services (up from 47% in 1999).
 - Strategic Outsourcing is the fastest growing services category with 17.7% growth projected from 2000-2004. This means that the 1000+ SO market will double between 2000 and 2004, to \$1,635 million.

Overview of CPG IT Opportunity by Geography

CPG Industry IT Opportunity

(Enterprises with Greater Than 1000 Employees)

Geography	YTY Growth (2000-2001)	2004	2000-2004 CAGR
		Opportunity (In US\$ Millions)	
WW	7.7%	8485	9.0%
Americas	8.5%	4287	9.8%
EMEA	8.9%	2270	10.2%
AP	5.1%	1938	6.0%

(Enterprises with 100 to 999 Employees)

Geography	YTY Growth (2000-2001)	2004	2000-2004 CAGR
		Opportunity (In US\$ Millions)	
WW	8.3%	6002	10.1%
Americas	9.5%	1233	10.2%
EMEA	9.2%	3492	11.1%
AP	5.0%	1277	7.4%

Source: June 2000 Global Market View

CPG IT Opportunity and Growth Estimates by Geography and Major Categories (Enterprises 1000+ Employees)

**CPG IT Opportunity and Growth Estimates
by Geography and Major Categories**

Enterprises With Greater Than 1000 Employees

WORLDWIDE

IT Element	2004 WW (In US\$ Millions)	2004 WW % of IT Spend	WW CAGR 2000 to 2004
Client	1379	16.2%	6.0%
Server	515	6.1%	2.5%
Technology	377	4.4%	7.1%
Software	1796	21.1%	9.0%
Services	4429	52.2%	11.2%
TOTAL	8495	100.0%	9.0%

AMERICAS

IT Element	2004 Americas (In US\$ Millions)	2004 Americas % of IT Spend	Americas CAGR 2000 to 2004
Client	756	17.6%	6.2%
Server	180	4.2%	2.0%
Technology	122	2.8%	6.9%
Software	906	21.2%	8.1%
Services	2324	54.2%	12.9%
TOTAL	4287	100.0%	9.8%

EMEA

IT Element	2004 EMEA (In US\$ Millions)	2004 EMEA % of IT Spend	EMEA CAGR 2000 to 2004
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Client	256	11.3%	5.2%
Server	175	7.7%	5.4%
Technology	137	6.0%	11.7%
Software	603	26.5%	11.9%
Services	1101	48.5%	11.3%
TOTAL	2270	100.0%	10.2%

AP

IT Element	2004 AP (In US\$ Millions)	2004 AP % of IT Spend	AP CAGR 2000 to 2004
Client	368	19.0%	6.0%
Server	161	8.3%	0.1%
Technology	118	6.1%	2.8%
Software	287	14.8%	6.4%
Services	1004	51.8%	7.5%
TOTAL	1938	100.0%	6.0%

CPG IT Opportunity and Growth Estimates by Geography and Major Categories (Table 3) (Enterprises 100-999 Employees)

CPG IT Opportunity and Growth Estimates by Geography and Major Categories

Enterprises With 100 to 999 Employees

WORLDWIDE

IT Element	2004 WW (In US\$ Millions)	2004 WW % of IT Spend	WW CAGR 2000 to 2004
Client	864	14.3%	5.0%
Server	485	8.1%	4.9%
Technology	311	5.2%	11.1%

Software	1337	22.3%	11.4%
Services	3006	50.1%	12.0%
TOTAL	6002	100.0%	10.1%

AMERICAS

IT Element	2004 Americas (In US\$ Millions)	2004 Americas % of IT Spend	Americas CAGR 2000 to 2004
Client	210	17.0%	4.9%
Server	60	4.9%	1.6%
Technology	35	2.8%	7.9%
Software	216	17.4%	8.1%
Services	712	57.7%	13.9%
TOTAL	1233	100.0%	10.2%

EMEA

IT Element	2004 EMEA (In US\$ Millions)	2004 EMEA % of IT Spend	EMEA CAGR 2000 to 2004
Client	372	10.7%	6.4%
Server	292	8.4%	6.1%
Technology	196	5.6%	12.9%
Software	864	24.7%	13.1%
Services	1768	50.6%	12.0%
TOTAL	3492	100.0%	11.1%

AP

IT Element	2004 AP (In US\$ Millions)	2004 AP % of IT Spend	AP CAGR 2000 to 2004
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Client	281	22.0%	3.4%
Server	133	10.4%	4.1%
Technology	80	6.4%	8.5%
Software	256	20.0%	9.1%
Services	526	41.2%	9.7%
TOTAL	1277	100.0%	7.4%

8.0 Recent Initiatives

Beyond standard enterprise planning and transaction systems requirements – financials, customer service, human resources, order management and inventory management – CPG Food Manufacturers require systems support for warehouse management, electronic commerce (EDI and Internet), and supply chain decision support (demand and supply planning, transportation planning, and physical distribution strategy).

The most advanced firms in the industry have implemented supply chain planning systems and developed relationships with business partners that allow them to track and automate the flow of goods from the supplier, through their warehouses and onto outbound trucks. Increasingly, these leaders are implementing cross-docking operations in which they coordinate inbound supplier shipments with outbound retailer requirements and literally move the product from one dock to another, without ever putting the inventory into stock.

Such efficient flow of goods requires both sophisticated technology and highly integrated business partner relationships, and has taken years for the most progressive companies to implement. As the technology becomes less expensive and grows simpler to implement, more medium and small firms will begin to implement these types of solutions.

In the meantime, medium and small firms with a survival and growth strategy are implementing, and will continue to implement, basic warehouse management systems, inventory planning systems and transportation planning systems. These systems have in the past two years become more plentiful, simpler to implement and less expensive.

Information systems for Food Manufacturers need to accommodate most if not all of the following handling and distribution characteristics:

UPC Barcode Scanning

UPC stands for Universal Product Code. UPCs originate with a company called the Uniform Code Council (UCC). A manufacturer applies to the UCC for permission to enter the UPC system. The manufacturer pays an annual fee for the privilege. In return, the UCC issues the manufacturer a six-digit manufacturer identification number and provides guidelines on how to use it. You can see the manufacturer identification number in any standard 12-digit UPC code.

The UPC symbol printed on a package has two parts:

- ◆ The machine-readable bar code
- ◆ The human-readable 12-digit UPC number

The manufacturer identification number is the first six digits of the UPC number. The next five digits are the item number. A person employed by the manufacturer, called the UPC coordinator, is responsible for assigning item numbers to products, making sure the same code is not used on more than one product, retiring codes as products are removed from the product line, etc. In general, every item the manufacturer sells, as well as every size package and every repackaging of the item, needs a different item code.

Radio Frequency (RF) Systems

RF systems are closely related to bar coding. Using Radio Frequency Identification (RFID), RF systems were created using wireless technology. The RF systems allow for non-contact reading and are effective in manufacturing and other hostile environments where bar code labels could not survive. According to the RFID.org Web site, there are key attributes and limitations to these systems that include:

- ◆ Growth area of automatic identification and data capture
- ◆ New generation, lower cost transponders offering multi-read capabilities
- ◆ Read/write electronic storage technology
- ◆ Wide range of products satisfying a range of data storage and data transfer needs
- ◆ Low to reasonably high (64Kbits) data storage capability
- ◆ Wide range of data transfer rates, depending on device and carrier frequency used. Generally speaking, the higher the carrier frequency the higher the data transfer rates achievable
- ◆ Close proximity (inductive systems) to tens of meters (radiating systems), without the need for line-of-sight interrogation, depending upon type of transponders and interrogation hardware
- ◆ Robust constructions available, allowing use in reasonably harsh conditions

Scan Based Trading (SBT)

Scan based trading enables retailers to replenish inventory and pay suppliers through point-of-sale data. SBT is of most interest to direct store delivery (DSD) suppliers, rather than those using the traditional two-tier distribution system. Retailers provide suppliers with daily sales reports and pay via electronic funds transfer based on the goods scanned at checkout. The manufacturer retains title to all products until a consumer purchases it. This system streamlines the supply chain process - eliminating time and paperwork and increasing customer satisfaction. The cost of carrying excess inventory by the retailer or manufacturer is greatly reduced. Receiving time at the loading dock is reduced. Faster promotion settlements are made between the manufacturer and retailer. The customer benefits from fresher products and fewer out-of-stock items.

An SBT pilot program conducted by the Grocery Manufacturers of America in 2000 involved 2 retailers and 12 manufacturers. The study showed SBT delivered sales growth of 4% compared to control stores, shrink was controlled to 0.3%, suppliers saved 20-30 minutes per delivery, and deductions were completely eliminated for SBT participants.³²

³² Results provided in the Bank of America, Food Industry Quarterly, First Quarter 2002.

CPFR

According to www.cpfr.org Collaborative Planning, Forecasting and Replenishment (CPFR) is a concept that allows collaborative processes across the supply chain, using a set of process and technology models that are:

- ◆ Open, yet allow Secure Communications
- ◆ Flexible across the industry
- ◆ Extensible to all Supply Chain processes
- ◆ Support a broad set of requirements (new data types, interoperability with different DBMSs, etc.)

The mission of the Collaborative Planning, Forecasting and Replenishment initiative is closely tied with similar efforts that have preceded it - such as ECR, Quick Response and VMI. Its objectives are consistent with the objectives of the Voluntary Inter-industry Commerce Standards Association (VICS), - a voluntary, nonprofit organization, which takes a global leadership role in the ongoing improvement of the flow of product and information (about the product) throughout the entire supply chain in the general merchandise retail industry. The mission of VICS is to "improve the partnership between Retailers and Vendor Merchants through shared information." The sub-committee hopes to achieve this by providing an environment for dynamic information sharing integrating both "demand" and "supply" side processes (linking manufacturers, retailers, and carriers), and effectively planning, forecasting, and replenishing customer needs through the total supply chain.

Interactive Branding

Interactive Branding involves using a variety of channels to promote products. Using marketing through the Internet, retail and catalog channels, companies can include consumers purchases by sending a message, or promotion, through several channels.

Electronic Data Interchange (EDI)

EDI streamlines payables and receivables electronically - including invoices, purchase orders, shipping notices, proof of delivery, payment authorizations. Its benefits include:

- ◆ 24/7 integrated document delivery, payment, and tracking,
- ◆ Full purchasing cycle support,
- ◆ Form quotation, to fulfillment, to billing and settlement,
- ◆ Reduction of costly errors,
- ◆ Elimination of printing, paper, and mailing costs,
- ◆ Reduction of administrative time,
- ◆ Accurate transaction tracking,
- ◆ And, electronic payment options.

Transportation Management

Transportation Management Systems help control shipping processes by fully integrating logistics functions beyond normal features. These systems help minimize delivery costs, and in turn, increase revenues. It has been a trend that third party logistic providers hosted transportation management systems (TMS) via the Internet. Symbol states that, "the transportation operation of the business is a cost frontier where new systems are providing tremendous savings while greatly improving operational control." TMS provides improved fleet visibility, driver and dispatch productivity, store communications and management reporting through real-time data and decision making.

Warehouse Management Systems (WMS)

WMS are software packages that help distributors optimize their use of warehouse space and warehouse labor. Many distributors who implement advanced warehousing and labor management systems can quantify significant benefits above and beyond those attained through the implementation of the Business Management System (BMS) / Enterprise Resource Planning (ERP) system. For example:

- ◆ Improved warehouse productivity by 10%-50%
- ◆ Reduced shrinkage/spoilage
- ◆ Reduced returns resulting from mispicks
- ◆ Improved space utilization

ERP systems only provide users with high-level inventory management. WMS provides real-time tracking of warehouse inventory and in-turn optimizes warehouse operations.

Trade Management

IBM's Trade Management solution combines an industry "Best of Breed" ISV, management & technical consulting, hardware and software to deliver an integrated industry solution that addresses the CPG industry's number 1 pain point. TPFM (Trade Promotion Funds Management) is the number one industry pain point according to Grocery Manufacturers of America. CPG industry spends \$33B on trade promotion activity and with trade management delivered an "incremental" \$2B in revenue or approximation \$200M in incremental profit. IBM's solution uses CAS - Number 1 SFA software in CPG. Trade management is a pure CPG play that aligns to this industry's unique processes (not a retreaded product). It offers integrated promotion planning and funding processes. CPG Companies have the opportunity to benefit from e-enabling their trade promotion activities:

Designing Promotions: Create real-time promotions; Search for promotions on-line through portals

Tracking: Performing real-time, in the field shifting of funds between accounts, products, brands; Improve performance of specific promotions

Deduction Management: Create paper trail of transactions; Reduce invoice errors and deductions

Account Review: Real-time evaluation of accounts; Enable true pay-for-performance

Financial Settlement: Speed up settlement process and enhance collection; Reduce administrative costs

Promotion Technique Analysis: Examine results of promotions versus spending; Obtain true ROI; More closely examine sales data and consumer buying habits

Supply Chain Management (SCM)

Procurement, manufacturing, and distribution together compose the heart of the supply chain through which consumer goods pass into the hands of customers. The process that begins when raw materials arrive at a manufacturing plant continues until finished goods have been transported from the plant to the point at which they are purchased by consumers. Effectively managing the supply chain offers huge benefit opportunities for CPG companies. In order to achieve these benefits, it is essential that the solutions that monitor electronic triggers, parameters, and execution procedures be implemented in such a way that a truly integrated supply chain is supported.

Preferred Customer Programs

Using loyalty cards, CPG companies can offer special promotions to card-holders. In turn, the CPG companies have access to valuable consumer data. This data can be used to analyze consumer demographics and buying behavior, as well as the success of a promotion.

e-Procurement

The ability to streamline a company's procurement process will add tremendous value to the CPG industry. Most companies contract with one main distributor and sign back-up agreements with 2-3 other distributors for emergency or specialty items. All locations are then expected to buy from the main distributors but each have the freedom to place their own purchase orders.

Today, third party vendors offer e-Procurement solutions. However, forward-thinking distributors will quickly realize the value of providing an e-procurement solution to their customers. These solutions create a wealth of information from which manufacturers could provide additional value-add services, such as rebate management and inventory planning across multiple business units.

9.0 Vendors

9.1 ISVs

There are several ISVs that have packages and services for CPG companies. A few of these companies and their products are highlighted in this section.

Ariba

Ariba pioneered the eProcurement industry and now leads the Enterprise Spend Management (ESM) market. Enterprise Spend Management is a new class of solutions that focus on delivering closed loop control and leverage of a company's spend. Most large companies already know how to reduce their spend, the challenge is to systematically control all key procurement interactions across the enterprise to deliver deeper and more sustainable spend reductions. Ariba has several offerings: Analysis, Sourcing, Procurement and Supplier Network. <http://www.ariba.com>

Eclipse Distribution Software

Since inception, Eclipse has been dedicated to the integration of new technologies and business techniques that help our customers optimize business efficiency in a real-time, paperless environment. From wireless connectivity to Internet-centric applications for collaborative e-business, Eclipse delivers high-performance, business application software that helps clients penetrate new markets and their ability to serve existing customers.

Operating in both the UNIX and Microsoft NT/Windows 2000 technology environments, Eclipse utilizes the open, object oriented nature of Java® technology to address many of today's most pressing computing problems-complexity, incompatibility and lack of security. Leveraging the business rules set forth by the Eclipse Application Framework (EAF), the Eclipse Distribution Management System (DMS) and its suite of Companion Products, optimizes the flow of information throughout the supply chain and puts the power of technology squarely in your hands. <http://www.eclipse.com>

i2

Through the IBM and i2 alliance, i2 has been providing its solutions to IBM's customers. The i2 5.2 family of integrated solutions is built so that companies can concentrate on the part of the value chain that will give them the highest return on investment. These solutions span supplier relationship management, supply chain management, and demand chain management to enable end-to-end workflows for any industry. Within these broad solution sets, i2 helps companies monitor, decide, and act on information to make long-term strategic decisions down to the execution phase, when a company must react to last-minute changes like the breakdown of a delivery truck or a last-minute order change. i2 solutions marry planning and decision-making to the execution phases of value chain management. Today's enterprise resource planning (ERP) applications can still be leveraged to record what already happened in your value chain. But businesses need forward-looking systems that can bring together the diverse systems of all business partners and channels, to allow the entire value chain to react for maximum customer benefit and profitability. <http://www.i2.com>

JD Edwards

The J.D. Edwards collaborative planning and fulfillment solution solves the dilemma of selecting a software solution that must be significantly modified. Distributors no longer have to sacrifice scalability and flexibility to realize distribution-specific functionality.

J.D. Edwards has been helping distribution organizations achieve the following business objectives for over 25 years:

- ◆ Control and optimize inventory levels
- ◆ Control and optimize warehouse and transportation costs
- ◆ Manage remote customer inventories
- ◆ Provide immediate, knowledgeable response to customer inquiries
- ◆ Enhance profitability through optimal pricing/promotion capabilities
- ◆ Focus employee activities on exception and high value-add activities

For more information, contact <http://www.jdedwards.com>

LANSA Commerce Edition

LANSA Commerce Edition is a suite of business-to-business (B2B) and business-to-consumer (B2C) components that are built upon LANSA's award-winning 'LANSA for the Web' tools. Commerce Edition allows you to rapidly generate e-business applications that integrate existing IBM eServer iSeries and xSeries Windows applications to the Web and wireless world.

LANSA Commerce Edition provides an easy, rapid and configurable solution to help extend core iSeries and Windows applications to both customers and business partners alike. Commerce Edition is a component-based solution that allows the selection of functionality for B2B or B2C Web site. The components provide a core set of standard business rules and definitions that are common across multiple Web sites, including customer self-service, merchandising and administration. LANSA Commerce Edition allows for configuration of the business rules and definitions through a set of simple questions and answers to fit specific application needs. For more information, contact <http://www.lansa.com>

LANSA for the Web

With LANSA for the Web, building business-to-business (B2B) and business-to-consumer (B2C) intranet and wireless applications that securely access and update iSeries® and Windows NT® or Windows® 2000 data is easier. With LANSA's 4GL it is easy to generate industry-standard graphical HTML, Java, XML, or Wireless Markup Language (WML) output.

LANSA's e-business Frameworks allows adoption of Web-design standards used in many high profile Web sites. The Frameworks contain Web components such as Order Transaction and Extended Search that developers can use to quickly generate Web applications. LANSA creates HTML or XML documents stored in IBM DB2® Universal Database for iSeries or Windows NT platform-based databases that can be edited and graphically enriched by your Web-authoring tool of choice. For more information, contact <http://www.lansa.com>

Manugistics Enterprise Profit Optimization

Manugistics Group, Inc., the leading provider of Enterprise Profit Optimization (EPO), helps companies lower operating costs, enhance profitability, and accelerate growth by optimizing the supply-demand

network from design and procurement through pricing and delivery. Enterprise Profit Optimization is an emerging business discipline made possible through the combination of the proven cost-reducing power of supply chain management (SCM) solutions, Supplier Relationship Management Solutions (SRM), and the revenue-generating capacity of pricing and revenue optimization (PRO).

Manugistics solutions help solve critical business needs:

- ◆ Enterprise Profit Optimization (EPO) solutions tightly integrate pricing and marketing actions on the demand side with the complex and ever changing conditions of the supply chain to help enhance profitability across the enterprise
- ◆ Supply Chain Management (SCM) solutions address the manufacture, movement, storage and service of products no matter how complex the business or how far-reaching the trading network
- ◆ Supplier Relationship Management (SRM) solutions facilitate multi-tier collaboration among suppliers, outsource manufacturers, and distributors. Pricing and Revenue Optimization (PRO) solutions help enable companies to optimize the prices they offer for all products, to all customers, through all channels by balancing the trade-offs between expected contribution to margin and such strategic objectives as market share.

For more information, contact <http://www.manugistics.com>.

Navision Axapta

Navision Axapta is the system that enables a client to bring the entire information flow together – from warehouse shop floor to customer delivery. It is an extended ERP solution that can integrate operations and allow for easy, real-time information exchange with suppliers and customers. It is a fully integrated ERP system that works equally well with multiple interfaces such as Windows or the Web. This means that no matter where the data is coming from, Navision Axapta integrates it all into one seamless information flow, creating an effective supply chain that links customers, suppliers, factories and distributors with one system. For more information, contact <http://www.navision.com>

NxTrend Strategic Exchange

NxTrend Technology, Inc. is a leading supplier of enterprise-wide software solutions for supply-chain management. NxTrend's products offer a single-source solution for information systems that are designed to enable the distributor to implement best-business practices for inventory management, order processing, sales, customer service, warehouse logistics, and strategic business analysis.

NxTrend's Strategic Exchange (SX) product line automates critical supply-chain business processes. The solutions in the SX product line work together to integrate the flow and access of information among suppliers, distributors, and customers. The SX product line consists of numerous applications for inventory management, warehouse logistics, finance and administration, business analysis, sales, distribution, customer service, and eBusiness. SX solutions are modular, scaleable, and configurable to meet customers' unique needs.

For more information, contact <http://www.nxtrend.com>

QAD eQ

QAD eQ is an intelligent central order management suite of Sell-side, Buy-Side and Replenishment applications that extends the back-office ERP systems to collaborate with customers, suppliers, and trading partners to deliver a competitive advantage. For more information, contact <http://www.qad.com>

Tecsys

From the front office through the warehouse and out over the road, TECSYS' innovations deliver the right tools and harness the right skills within each business. *EliteSeries* is available as an integrated enterprise suite of applications or as stand-alone best-of-breed components:

- ◆ [Enterprise Performance Management \(EPM\)](#)
- ◆ [Distribution Management System \(DMS\)](#)
- ◆ [Warehouse Management System \(WMS\)](#)
- ◆ [Transportation Management System \(TMS\)](#)
- ◆ [e-commerce](#)

For more information, contact <http://www.tecsys.com>

Vormittag Associates Inc.

Vormittag Associates Inc. (VAI) is a Premier IBM Business Partner VAI is the author of System 2000 Enterprise Management Software, a suite of dynamic applications for the Wholesale, Manufacturing, and Retail industries. System 2000 for Distribution provides state-of-the art order processing and inventory control functions, while System 2000 for Manufacturing covers the manufacturing and assembly processes from customer order through production. System 2000 for the Web provides integrated e-Business and e-commerce capabilities for all System 2000 applications for both business-to-business (B2B) and business-to-consumer (B2C) environments. VAI's SalesLinx application provides Sales Force Automation (SFA) and Customer Relationship Management (CRM) capabilities. VAI's flexible software design allows companies to streamline one area of their operation today and integrate other areas tomorrow. For more information, contact <http://www.vaihome.com>

9.2 Hardware Vendors

Symbol

Symbol Technologies is a world leader in mobile data management systems and services. The company approaches the market with:

- ◆ Innovative, high-performance products, principally laser bar code scanners, hand-held computers and wireless communications networks for voice and data; the company adds deep value with complementary capabilities in ergonomics, ruggedization, miniaturization and power management.
- ◆ Industry systems expertise, and business partnerships delivering value-added capabilities in retailing, transportation/logistics, warehousing, manufacturing, healthcare, education, government/military, hospitality and finance.
- ◆ Superior professional services, customer support, and education and training worldwide.
- ◆ Bar Code Scanning: Laser scanners ensure that data is captured quickly and accurately. A variety of peripheral devices could be used.
- ◆ Wireless LAN: Using 802.11b standards, standardized wireless LANS for voice and data exchange.

Automatic Data Capture (ADC) solutions from Symbol and its business partners keep food and drug retailers in touch with every facet of the supply chain. Supermarkets, drug stores and convenience stores all benefit from increased supplier and employee productivity, near perfect accuracy, higher profits and ultimately, higher levels of customer service and satisfaction. These benefits help to drive store loyalty; a critical consideration for commodity product sales, in which the consumer is often most influenced by convenience and price. For more information, contact <http://www.symbol.com/logistics>

10.0 White Papers for Review

B2B Considerations:

<http://wholesaledistribution.services.ibm.com/wdRefRoom.nsf/ContentAllReferences/14D0D5E988115A3086256AAA00556F12?OpenDocument>

Food Logistics – 2001 Industry Report – Making Strides (Supply Chain Technologies Census Report):

<http://www.foodlogistics.com/foodlogisticsindex.jsp>

Georgia Tech Logistics Institute:

<http://www.tli.gatech.edu/cgi-bin/whitepapers/papers.cfm>

11.0 Associations and Organizations

Bruce Merrifeld Consulting

<http://www.merrifeldconsulting.com/hotlinks>

Food Engineering

<http://www.foodengineeringmag.com>

Food Logistics

<http://www.foodlogistics.com>

Food Marketing Institute

<http://www.fmi.org>

Grocery Manufacturer's of America

<http://www.gmabrands.com>

Hoovers Industry Information

<http://www.hoovers.com>

Pembroke Consulting

<http://www.PembrokeConsulting.com>

Symbol Technologies – Transportation Management Systems

http://www.symbol.com/products/whitepapers/whitepapers_transport_mgmt.html

12.0 Acknowledgements

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