

September 2000

Online Grocery Shopping Around the World: Examples of Key Business Models

Jonathan Palmer

University of Maryland, College Park, jpalmer@hrsmith.umd.edu

Jukka Kallio

Helsinki School of Economics

Timo Saarinen

Helsinki School of Economics

Markku Tinnila

Helsinki School of Economics

Virpi Kristina Tuunainen

Helsinki School of Economics

See next page for additional authors

Follow this and additional works at: <https://aisel.aisnet.org/cais>

Recommended Citation

Palmer, Jonathan; Kallio, Jukka; Saarinen, Timo; Tinnila, Markku; Tuunainen, Virpi Kristina; and van Heck, Eric (2000) "Online Grocery Shopping Around the World: Examples of Key Business Models," *Communications of the Association for Information Systems*: Vol. 4, Article 3.

DOI: 10.17705/1CAIS.00403

Available at: <https://aisel.aisnet.org/cais/vol4/iss1/3>

This material is brought to you by the AIS Journals at AIS Electronic Library (AISeL). It has been accepted for inclusion in Communications of the Association for Information Systems by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

Online Grocery Shopping Around the World: Examples of Key Business Models

Authors

Jonathan Palmer, Jukka Kallio, Timo Saarinen, Markku Tinnila, Virpi Kristina Tuunainen, and Eric van Heck



Communications of the **I**nformation **S**ystems
Association for **I**nformation **S**ystems

Volume 4, Article 3
September 2000

**ONLINE GROCERY SHOPPING AROUND THE WORLD:
EXAMPLES OF KEY BUSINESS MODELS**

Jonathan Palmer
University of Maryland, College Park
jpalm@rhsmith.umd.edu

Jukka Kallio
Timo Saarinen
Markku Tinnilä ,
Virpi Kristiina Tuunainen
Helsinki School of Economics

Eric van Heck
Erasmus University

TUTORIAL

ONLINE GROCERY SHOPPING AROUND THE WORLD: EXAMPLES OF KEY BUSINESS MODELS

Jonathan Palmer
University of Maryland, College Park
jpalmer@rsmith.umd.edu

Jukka Kallio,
Timo Saarinen
Markku Tinnilä
Virpi Kristiina Tuunainen
Helsinki School of Economics

Eric van Heck
Erasmus University

ABSTRACT

The grocery industry evolved from mom-and-pop stores to mega-markets to online grocery buying, with many different forms along the way. The global market for groceries in 2000 is over \$2 trillion. The online grocery segment of the market is expected to reach \$34 billion by 2002, a thirty-three fold increase from 1998. This tutorial examines the issues surrounding online groceries and looks closely at fourteen examples from the Americas, Europe, and Australia.

The online market is currently one of growth, not profits. Two key components of profitability for online vendors are the ability to generate sufficient volume, while keeping delivery costs low. The Internet also impacts business-to-business relations among grocers. This tutorial describes key online grocery firms including Peapod, NetGrocer, Streamline, WebVan, Ruok@Net, Albert Heijn, Disco, Ykköshalli, Shoplink, Coles and Woolworths. Each of these companies represents different business models, with differing organizational structure and scope of operations. Each has its own set of strengths and

weaknesses. To date, no company stands out from the rest with a proven model of success for dealing with national delivery, providing perishable food products, or achieving acceptable profits.

This article also analyzes the attractiveness of the online grocery market for entry by both Internet companies and traditional grocers. Environmental factors, store features, and household specific factors are examined in light of technical, cultural, organizational, and economic issues facing grocers and their consumers.

Keywords: electronic commerce, electronic grocery shopping, business models

I. INTRODUCTION

The grocery industry evolved from mom-and-pop stores to mega-markets to online grocery buying. The global market for groceries in 2000 is over \$2 trillion of which only \$300 million is online. The online segment of the market is expected to reach \$34 billion by 2002, a thirty three fold increase from 1998 (Business Week, 1998), and to increase to \$60 billion by 2007 (Dot.com, 1998, Hoovers, 1999). Regardless of the actual total number, electronic grocery purchase is expected to account for larger fractions of the overall market; 2% by the end of 2000, and 15-20% by 2007.

Online grocery initiatives are underway around the world. This tutorial examines the issues surrounding online groceries and looks closely at fourteen examples from the Americas, Europe, and Australia.

Global markets offer opportunities for online grocery retailing in the future. Although the US and Canada have perhaps the most sophisticated grocery outlets in the world, the rest of the world continues to evolve both in physical channels and in Internet usage. In 1997, the U.S. had 71% of the world's Internet traffic, followed by Japan, Germany and Australia/New Zealand (eStats,

1999). The non-U.S. Internet community however, is growing rapidly and is expected to have more than 50% of the world's user base as early as 2003.

The key grocery firms are aware of the existence of both global opportunity and competitive threats. However, while growing Internet use opened more opportunities for global expansion, implementation is still more in the form of physical expansion through openings of new grocery stores and acquisitions. Although individual groceries are mostly national, cross-border delivery of grocery goods ordered from online stores is feasible, as in the case of NetGrocer's on line selling non-perishable grocery goods to U.S. diplomats in Ghana.

To understand the readiness of the global market for Internet grocery retailing, we:

- analyzed the current state of the grocery business and the key business models being employed to create online groceries
- examined 14 on-line grocers in Australia, Europe, South America, and the United States. These areas represent the greatest opportunities for online grocery retailing.

This tutorial consists of eight sections:

- Section II provides historical background
- Section III identifies key industry trends and forces
- Section IV examines grocery shopping consumer behavior
- Section V identifies key business models currently employed
- Section VI presents 14 specific cases in six countries
- Section VII discusses the findings and the issues facing electronic groceries.
- Section VIII presents the conclusions

NOTE: Throughout, we use the abbreviations EG for electronic grocery and EGS for electronic grocery systems.

II. INDUSTRY BACKGROUND

With an emphasis on service, neighborhood “mom-and-pop” stores often held local monopolies, weaving themselves into the fabric of daily activity. These grocers serviced local specialty needs for meats, produce, or grain products. As broader markets developed, and consumers realized the benefits of convenience and selection, the “supermarket” concept was born. The grocery industry evolved to include large, multi-national firms operating 100,000 ft² (10,000 m²) or more, “superstores”. Industry fragmentation is decreasing as more grocers adopt ever-larger store formats and consolidate into fewer major chains. What remains largely unchanged however, are the razor-thin, 2%-4% profit margins that characterize the industry (Hoovers, 1999).

The “supermarket” first emerged in the 1930’s, offering lower prices through a large volume, self-service model. This trend of larger, self-service supermarkets is commonly cited as the first major innovation of the traditional grocery industry. The growth in popularity of the supermarket forced the exit of many “mom-and-pop” stores the 1930’s and 1940’s. During the 1950’s, the major grocery firms continued to grow, first with regional and eventually national expansion, followed by waves of consolidation.

The 1960’s gave rise to the second major innovation in the grocery retailing business: the convenience store. With an increasing number of dual-income households after World War II, many working families looked to such stores to provide essential, staple goods at all hours of the day, with less fuss. By 1995, as much as 35% of the entire grocery market was convenience stores.

The industry expanded again in the 1980’s and 1990’s to include membership-based stores such as Price Club, Sam’s Club, and Costco. Also, discount “megastores” such as Wal-Mart, K-mart, Sokos, and Cole-Myers leveraged their advanced logistical operations to include low-cost retailing of food products (Bloomberg, 1999). Niche firms, such as natural food specialists and gourmet shops, sought to capitalize on neglected consumer demands.

Every segment of the grocery market is covered by one or more of the 127,000 grocery retailers worldwide (Business Week, 1998).

Slowing growth, decreasing trade barriers, increasing price transparency, and an introduction of the Euro as a common currency are driving consolidation among European retailers. The first step in this consolidation process was the establishment of purchasing networks and joint ventures to achieve economies of scale on the supply side. This process is now being followed by merger and acquisition activities with the objective to obtain economies of scale over the whole value chain. The persistence of low inflation causes retailers to focus on reducing cost and the customer to focus on increasing value. An aging population, which seems to be a Europe-wide (and US) trend, will significantly alter the product and service offerings in Europe. The concentration level of grocery sales varies throughout Europe. For example, the 5 biggest retailers have a market share ranging from slightly above 50 % in France to more than 90% in all of the Nordic countries.

The latest innovation in the grocery industry is the move to the Internet (Schwartz, 1997, Shook, 1998). These online ventures look to the electronic channel to provide improved personalized service and convenience to specific market segments (Palmer, 2000). They hope to leverage information technology to provide

- front-end interface for improved personalized service,
- back-end logistical order-fulfillment,
- delivery and billing process

These improvements are expected while also gaining valuable transaction-level consumer information for improved marketing (LaPlante, 1999).

The move to the Internet also offers a different set of costs and benefits for both grocer and consumer. From the grocer's standpoint, the key issue is always the overall cost structure involved in getting the groceries in the hands of the customer. Direct costs include the payments to wholesalers and distributors for aggregating the products and delivering them to the distribution centers and final delivery to the retail stores. The costs for the traditional grocery vary based

Communications of AIS Volume 4, Article 3
Online Grocery Shopping Around the World: Examples of Key Business Models by J. Palmer et al.

on the transportation costs. Traditional grocers also have the cost of putting the product on the shelves, staffing the checkout lines, and the carrying costs of the physical retail space.

For pure online groceries, the arrangement of goods can be more efficient, leading to a lower cost for the product. Online grocers can develop distribution mechanisms that do not require retail space and provide fulfillment services to end customers from distribution centers specifically designed for individual picking, packing and shipping. The economic model therefore shifts for EGS, with savings on the supply chain and additional costs for delivery.

For those grocers adopting a hybrid model, with both traditional and online offerings, the handling and logistics are often separated given the different needs for display versus picking and packing. Those grocers offering in-store picking and packing generate another cost and must develop a mechanism to defray the added expenses of staff time for picking and packing customer orders.

A comparison of the traditional and online value chains is presented in Figures 1 and 2.

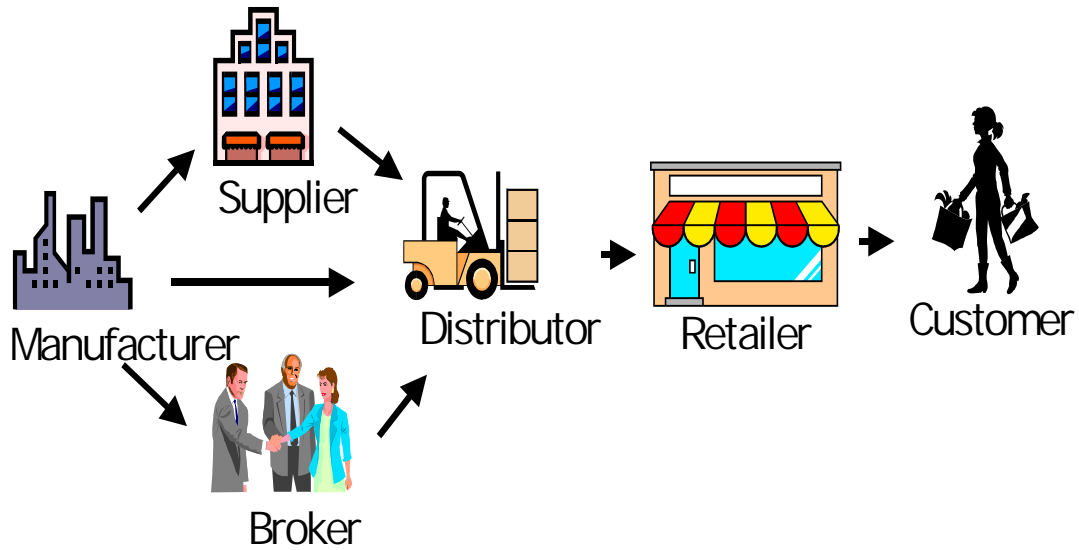


Figure 1. Traditional Retail Supply Chain

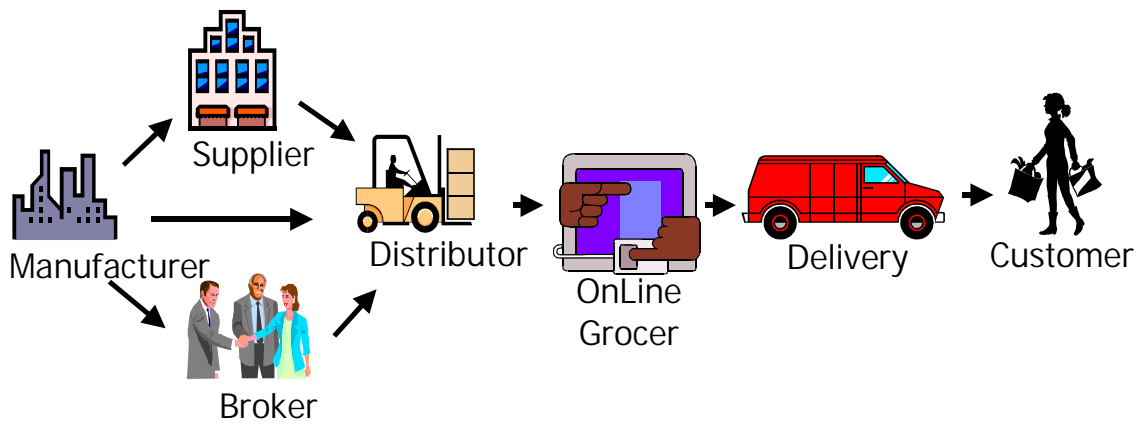


Figure 2. Online Grocery Supply Chain

From the customer's standpoint, the key issue is the overall cost of the shopping process to get the groceries to the home. These costs can include time, travel, and product prices. The total cost of a market basket of goods offered by online and traditional grocers will differ depending on the good

selected and the transportation cost (Kallio, Kemppainen, Tarkkala, and Tinnilä, 2000).

III. DRIVING FORCES WITHIN THE INDUSTRY

This section reviews the key forces within the existing grocery industry. It provides discusses customer related issues, channel management, alliances, logistics, and product mix. These forces are then analyzed in terms of their impact on the costs and benefits of online grocers.

CONTROLLING THE CUSTOMER RELATIONSHIP

Controlling the relationship with the end consumer is a key factor in grocery retailing. Existing major firms exert power over the supply chain by their relationship with consumers. The relation is transactional, high reach, and potentially information rich. The competition between existing chains and Internet-only grocers is in major part a battle for the consumer information this relationship imparts and the potential that exists for extending the relationship.

BUILDING A DIFFERENTIATED, CUSTOMIZED SHOPPING EXPERIENCE

Internet grocers seek to establish a relationship with consumers which is much more intimate and convenient than the existing supermarket relationships. They start with the distinct disadvantages of very little brand awareness and the need to attract customers to their sites. Traditional supermarkets have the advantage of massive databases of information on customers' buying habits and brand equity that can be used in a multi-channel approach to build an Internet presence. Internet grocery shopping provides the opportunity for a high reach platform from which companies may develop rich customer relationships through customizing and personalizing the transaction process.

BUILDING NEW CHANNELS AND POTENTIAL CHANNEL CONFLICTS

Existing chains perceive Internet grocers as creating channel conflict by cannibalizing the existing grocery market share and by moving customers to an even lower margin channel (Business Week, 1998). These lower margins for groceries would be created if the established chains are forced to work around

large brick and mortar investments which do not handicap the efficiencies of the Internet grocery business. Thus, for existing chains, the considerable logistics costs together with low margins imply little value is currently being added to supermarket operations through the Internet. Hence the pilot systems currently under way by existing grocers are essentially awkward defensive mechanisms aimed at retaining customers rather than seen as attempts to reengineer the value chain.

Internet-only grocers see channel conflict as an opportunity to establish their own alliances with grocery wholesalers, thereby shortening the value chain. To them, the cost of running an Internet grocery business is reduced significantly because they do not incur the costs associated with running the brick and mortar operation. However, the benefits of the shortened value chain are offset, to some extent, by the new delivery costs.

BUNDLED SERVICES

Some analysts (Business Week, 1998, Supermarket News, 1999) see the traditional grocery chains as potentially bundling services by using their customer databases and corporate size. The opportunity exists to combine products and services into the Internet corporate web site, most likely by adding financial services such as the ability to pay bills, invest, and buy insurance. Companies such as Coles Myer could create bundled offerings of these services in-house, but an alliance with an existing financial institution is likely to provide expertise, speeding the introduction of services. While the smaller Internet-only grocers would struggle to create their own financial services, an alliance with financial institutions or suppliers of other goods and services is a distinct possibility. The ability to provide effective and value adding bundling would provide the basis for differentiation among competing Internet grocers.

GROWTH RATES AND THE ROLE OF ALLIANCES IN ACHIEVING SCALE

Although the grocery industry changed considerably over the years, perhaps the largest impact was mergers and acquisitions. A host of past business deals created several major brick and mortar firms. Consolidation is evident in most major countries.

If Internet-only firms are to compete with the major brick and mortar firms, they need to develop efficient distribution methods. In particular, alliances (e.g., with courier firms) can be formed to facilitate efficiencies. Also important is the speed of online retailing growth. While the incremental cost savings resulting from one more Internet customer are not high on the Internet service/ordering side of the value chain, they are significant in terms of reducing grocery delivery costs. Internet grocery retailers need to build depth and customer loyalty quickly to obtain economies of scale, reduce cost, and be competitive for delivery services.

LOGISTICS IN THE GROCERY VALUE CHAIN

With Internet grocers constructing shortened value chains, delivery to consumers becomes a larger proportion of value chain costs. The types of delivery service available and the efficiency of these services play a major role in defining the margins available in the Internet-only business. New and modern logistics centers can automatically pick and package any basket of goods with small marginal costs. Traditional grocery chains would appear to have two options:

1. To construct new and more efficient delivery systems for online goods
2. Use the existing network of brick and mortar assets to provide a pick up point for consumers who have ordered on line (thus eliminating an expensive part of the value chain).

PRODUCT MIX

Groceries are, for the most part, necessity goods. The percentage of income spent on groceries declines as the standard of living of an economy or wealth of an individual increases. With higher disposable incomes, reliance on grocery lines alone will limit the revenue of grocery operators in what has been a low margin business. It would seem that it is imperative to establish an extended product mix.

Another important trend is that of grocers focusing on higher-margin product assortments, including private label brands, while phasing out third and fourth tier brands. Ready-to-eat, single-serve "meal solutions" enhance profitability, as do timesaving products like pre-cut produce. Moreover, an increase in peripheral businesses such as in-store banks, pharmacies, on-site fuel centers, and photo processing also enhance profitability. Traditional grocers have a steady high-volume foot-traffic and seek to leverage this flow with additional service and product offerings.

The EG has the opportunity to extend the product mix through presentation of a variety of product offerings not available in the physical store. Coordinating the product flow through distribution centers offers the opportunity to carry some products that would not have a sufficient inventory turnover in the physical store to justify stocking the product on the shelves. The EG's provision of a broader product array is also an opportunity for differentiation.

CUSTOMER DEMOGRAPHICS AND DELIVERY EFFICIENCY

Changing demographics affect the costs of delivering services associated with each aspect of the value chain. Higher population density offers a stronger opportunity for EG to take advantage of reduced delivery times and costs. A move to higher density inner city living should have a significant impact on the viability of delivery services associated with on-line grocery shopping. However, some of this gain is offset by the longer time required to drive through city streets and find parking. Also influencing the buying patterns of individuals is the trend

toward a busy lifestyle and the provision of convenience services not currently offered by supermarkets.

IV. GROCERY SHOPPING BEHAVIOR AND CUSTOMER CHARACTERISTICS

This section examines the factors influencing shopping behavior that need to be considered when offering electronic grocery (EG) shopping. The section also develops a profile of specific customer types based on shopping behavior, demographic, and location characteristics.

FACTORS INFLUENCING GROCERY SHOPPING BEHAVIOR

The factors influencing conventional shopping behavior can be categorized into three groups:

- environmental factors describing area and geographical location,
- store features available to customers, and
- household specific factors for each individual customer (Impola et al, 1998, Kallio, Saarinen and Tuunainen, 1997).

Environmental Factors

The main environmental factors are physical proximity to grocery stores and type of transportation used for shopping. Seasonality may also influence the shopping behavior in both frequency of shopping visits and the product mix available to and requested by customers.

Store Features

The following store features are important for conventional grocers :

1. The hours the shop is open used to be one of the most important restrictions on grocery shopping. As opening hours increase, this factor is less of an issue except for some mom-and-pop stores.

2. The personal service level provided can vary from insignificant to extremely important depending on the customer. Service level is a management choice.
3. The price level and product range are the classic dimensions for diversification in this market.
4. The amount and type of advertising affects the volume and composition of customers.
5. The store size, layout and checkout speed are important parameters for customers seeking to minimize their shopping effort and avoid congestion as much as possible.

Household Specific Factors

Factors such as household structure define the specific consumption needs, especially the nutrition required. Consumption differs significantly among customer groups such as singles, older couples, and multi-children families. Availability of storage and refrigerated space also plays a role. Income level, knowledge, and skills influence product selection. Culture and loyalty to the local retailer are also important factor in customers' propensity to change habitual shopping behavior.

CONSUMERS

Consumer Groups

Seven clearly identifiable groups may be interested in buying their groceries from the Internet. The relative proportions of these groups vary by country.

1. Suburban family commuters around large cities

This group is interested in reducing the time and effort spent on shopping for groceries. They also value the reduced time needed for Internet shopping and the opportunity to arrange delivery. This group is typically willing to a pay a premium for enhanced service.

2. Wealthy adults seeking high quality services

This category includes the so-called "money rich, time poor", people with above average incomes but little spare time. For these people, time is the ultimate commodity and they are willing to pay handsomely for services that preserve it. They demand superior service and top-quality products for the money they pay. These people are often interested in special (luxury) products.

3. Elderly or disabled people relying on social services

As the population ages, demand for more accessible shopping services should grow. With retailer consolidations reducing the number of physical stores and increasing their distance from shoppers' homes, the opportunity for online shopping is heightened. Heikkilä et al. (1998a) showed that online purchasing can create large indirect savings to the public sector which will increasingly be called upon to provide social services to the elderly or disabled.

4. Computer literate generation

That segment of the population growing up with computers finds the use of the Internet for online grocery shopping quite natural. These customers are also pleased with the easy access of an Internet grocery store and they are likely to have Internet available both at home and at work/school.

5. Rural area dwellers

Having access to a hypermarket's offering without having to drive great distances is a powerful motivator for this group. The ability to pick from a large selection of goods and have them delivered to their front door or perhaps the nearest post office, should be worth a price premium.

6. Business-to-business customers

An online wholesale outlet would be very attractive to many retailers and restaurants as it could include new services like account management and easy ordering using standard "shopping lists". These buyers value the efficiency, speed and ease of online purchasing and economies of scale enable cost savings for the wholesaler as well. The proportional cost of delivery would be smaller as individual orders are likely to be large. Larger package size might also

make warehouse automation practical. However, online wholesale outlets compete with existing distributors in this market.

7. Bargain seekers in large cities

People in this group are price sensitive and are constantly looking for the best buy. The Internet facilitates price comparisons quickly and easily and large cities provide ample competition.

Categories of Shoppers

These seven groups can be divided into two general categories according to the value emphasized:

- service seekers and
- price/efficiency seekers.

Service seekers are interested in the convenience and information value of the service. These people are attracted to extra services like recipes, standard and customizable shopping lists, and nutritional data. Naturally a wide selection of items is important, as is the quality of goods received.

The price/efficiency seekers value low price and efficient buying processes most. Their best source might not be the one with the lowest prices but the one giving the lowest total cost when time and effort are considered. This group is interested in speedy and no-bother ordering, cost, and delivery time.

The two categories are also called “Run” shoppers and “Fun” shoppers (Van Heck, 1998); with run shoppers valuing convenience and fun shoppers willing to take more time and enjoy the shopping experience. Table 1 lists the benefits from electronic commerce to both of these categories.

Inhibitors

The frequent routine of shopping for daily goods generates significant habitual purchase patterns that may be difficult to break. These habits include:

Table 1 Electronic Commerce Benefits

Customer Category	Benefits in terms of...	Origins of the Benefits
Service Seekers	New ways in planning for the shopping	Customized or standard shopping lists Recipes Special offers Broad selection of products
	New forms for delivery*	Home delivery Drive-in type pick-up terminals Staffed pick-up terminals Local unmanned pickup facilities
	Time independence in placing orders	Unlimited ordering time Accessibility of many alternative groceries
Price / Efficiency Seekers	Reduced time and effort in shopping	Shorter ordering time No commuting to the grocery store No collection of products No payment at the cashier
	Reduced out-of-pocket costs	Lower prices Better control of costs

* See Section VII for a discussion of delivery forms

- the ability to test and examine the products and
- the opportunity to see related items that were not originally on the shopping list.

From a technological standpoint, Internet access is not ubiquitous. In some locations, the quality of Internet service makes it difficult to process the necessary photos and textual description to present the grocery items. A typical catalog of 10,000 items with photos can make download times slow enough to inhibit ongoing use of EGS on low bandwidth connections. While slowness will eventually be overcome with improved access, in some locations it is still a significant inhibitor to adoption (Banaghan, 1999). In addition to performance, the concerns of security of online payment continues to be of concern to some consumers (BusinessWeek, 1998).

Logistical issues also seem to be a sticking point for both consumers and grocery providers. These logistical issues include both difficulties in timing of deliveries and the flexibility of delivery mechanisms. Finally, the pricing of EGS typically requires some additional premium for handling and delivery which may

make the overall price less attractive. These inhibitors to EGS are summarized in Table 2.

Table 2. Forces Inhibiting Consumer Adoption of EGS

Force	Description
Habitual purchase patterns and loyalty to the "house retailer".	This "economic inefficiency" is difficult to measure but is likely to apply for a significant number of consumers in the near future.
Lack of real shopping experience	EGS can, at best, show cyber equivalents of the goods available.
Lack of Internet access	To have full flexibility for using EGS, the customer needs access to the Internet both from work and from home.
Technology barrier and lack of confidence in payment security	This force is believed to be a significant barrier in the near-term but not the long-term.
Time flexibility for receipt of goods	Customers need the best possible flexibility for receiving the goods.
Price	EGS need to be price competitive especially to appeal to groups without time constraints or disabilities.

V. BUSINESS MODELS FOR THE ELECTRONIC GROCERY STORE (EGS)

The literature presents several approaches to defining business models for electronic grocery shopping (Heikkila et al, 1998a and 1998b, Kallio, Saarinen, Tinnilä, and Tuuanainen, 2000, Tuuanainen, 1999). Each focuses on different elements including:

- EGS based on existing brick-and-mortar store,
- specialized EGS,
- EGS based on separate channels, and
- EGS based on intelligent and automated channels, value chains and business processes.

While all EGS providers wrestle with many of the same inhibitors, they do appear to have chosen models that are based on both

- the scope of operations and
- the structure of the company itself.

The scope includes the number of markets served and the number of distribution points. The structural dimension is based on the decision either to provide an entirely virtual, Internet interface to customers or to adopt a hybrid of both Internet interfaces and brick and mortar operations. Table 3 outlines this scope and structure matrix for the example cases discussed in Section VI.

Table 3. EGS Models

		Scope	
		Few Markets and Distribution Points	Many Markets and Distribution Points
Structure	Hybrid	ICA Ruokamarkkinat Oy	Coles Myer Woolworths Albert Heijn Ykköshalli Disco
	Virtual	Ruok@net Streamline ShopLink	Peapod Net Grocer GreenGrocer WebVan

In the hybrid models, the EGS is based on existing brick and mortar stores, usually a hypermarket or a large supermarket. In this model the storekeeper provides the customers a Web-based interface through which the customer can browse the store inventories and order goods. After receiving the order, the storekeeper picks the goods from the shelves and delivers them to the customer or takes them to a take-out spot. This model offers the grocery store a new channel for marketing (advertising and feedback methods), finance (online payment), and ordering and distribution. The EGSs operating according to this model cannot compete on price since picking goods from the store shelves is inefficient and may require new personnel, which results in additional costs. However, in many cases online customers familiar with the physical store, are convinced of its quality, and are therefore willing to pay for the service and the extensive product offerings, creating volumes big enough for profitability.

The other end of the spectrum is EGSs that specialize in online business and do not have a physical store. Specialized EGSs perform the operations of both the wholesaler and the retailer. The customer interface may be very similar

to that of the traditional model but the operations differ significantly because the EGS removes one step from the supply chain. An electronic grocery store can achieve efficiency and low costs by automating the order process and operating its own warehouse/distribution center that is optimized for picking small batches. A specialized EGS can also handle the distribution more effectively than an EGS that operates inside a physical store.

VI. EXAMPLES OF ONLINE GROCERY RETAILING

Using the structure and scope model in Table 3 to identify key EGS examples, we analyzed 14 EG competitors in six countries. The objective was to understand their business models, their strengths, and their weaknesses. Details about the fees, geography and business elements of each case are summarized in the Appendix. Highlights of the cases are presented in this section. Table 4 shows the exchange rate for the currencies quoted and the location of the individual firms.

Table 4. Country and Currency Conversion

Country	Currency Unit	No of Units/\$	Firms
Argentina	Peso	1 Ps	Disco, Greengrocer.com
Australia	Dollar	1.49 A\$	Woolworths, Coles,
Finland	Finn mark	6.3 FIM	Ruokamarkkinat Oy, Ykköshalli, Ruok@net ,
Netherlands	Guilder	2.3 NG	Albert Heijn
Sweden	Krone	8.4 SEK	ICA
United States	Dollar	1\$	Streamline, Shoplink, Peapod, NetGrocer, Webvan

Note: Currency conversions are as of July 1, 2000

SMALL SCOPE AND HYBRID STRUCTURE

ICA

A typical example of an ICA electronic store in the greater Stockholm area is Maxi ICA Stormarknad. It provides both a brick-and-mortar supermarket and offers electronic services. Its web page states that the 5758 different products are provided on the Internet. Services include picking and packing the goods for the consumer to pick up (cost 55 SEK) and home delivery (cost 125 SEK). Delivery times are between 4 PM - 7 PM. The services are provided for ICA cardholders only and the goods are charged to the customer's ICA account.

Ruokamarkkinat Oy

Ruokamarkkinat Oy provides EGS capabilities to consumers in much of southern Finland. The firm also owns Ruokavarasto, a discount store chain. With physical locations in 8 cities, delivery areas are extensive in the Helsinki, Tampere, Turku, Pori, Rauma, Hollola, and Salo areas of Finland. Ruokavarasto developed its online services as a user-friendly and functional web site. The items in the online inventory mirror those in the physical stores. The sourcing of the items requested through the EG is handled through the physical stores and the distribution centers. Ruokavarasto believes that firms that are among the first movers in electronic commerce will be the ones with highest market shares and long-term competitive advantage. The delivery cost is 40 FIM regardless of order; pick up from store is free.

The extension of the firm's capabilities to the Internet reflects the organizational structure and locations of the physical store chain. The firm's hybrid structure uses existing infrastructure to support picking and packing of items ordered via the EG.

MULTIPLE SCOPE AND HYBRID STRUCTURE

Woolworths

Woolworths Supermarkets is Australia's largest supermarket chain with a 36% market share. They are the leader in a "brick and mortar" industry in which the barriers to entry are prohibitive. Woolworths established a strong brand identity, known for quality and product freshness.

Woolworths offers an Internet based shopping service to certain Sydney postcodes (currently approximately 200 metro suburbs) under the name Woolworths HomeShop. In addition, Woolworths established an exclusive supermarket banking deal with the Commonwealth Bank (known as Ezy Banking) that offers customers banking both on the Internet and within existing stores.

Woolworths is attempting to differentiate its EG offering by leveraging its brand equity from the traditional grocery. Currently, online offerings are not as extensive as the in-store inventory. Logistics of delivery are handled through the existing Woolworths fleet of trucks and vans. A minimum order is required and a 7.5% surcharge is added to cover the cost of delivery. In addition, the consumer must be at home to take delivery or the delivery will be attempted again the following day.

Coles

Coles Supermarkets is part of the Coles Myer Group, Australia's largest retailer with sales over A\$20.5 billion and over 154,000 employees. One move praised by analysts (Banaghan, 1999) was their decision to acquire Harris Technology, a computer reseller that distributes products through the Internet as well as through traditional stores. Harris Technology should provide Coles Myer needed experience and technology to be able to use the Internet as a new sales channel. Coles offers an Internet based shopping service to certain key areas (at present 25 suburbs in Melbourne and 41 in Sydney).

To utilize the Coles EGS, consumers must install software, which is available from the Coles web site or via a CD-ROM which can be requested from the physical store or at the web site. Registration details are required from the customer for each shopping session. Delivery is handled through the Australian postal system, allowing for refrigerated vehicles and 7 days a week delivery. Customers must select a two-hour delivery window and be available to accept the grocery items. The service requires a minimum order and has a flat fee of A\$12.

Ykköshalli

Ykköshalli is a large supermarket situated in Vantaa, in the greater Helsinki region. The owners, who operate as Kesko retailers (Kesko Group is the largest grocery chain in Finland), initiated online grocery shopping as a value added service for the existing store. To purchase online, a customer has to have Kesko-group's Plussa-membership card. Home delivery cost is 40 FIM. The cost of picking up the goods from the store is 20 FIM. Currently they distribute online purchases to the greater Helsinki region from Tuesdays until Fridays between noon and 8 PM. The layout of the web store is to be common for all Kesko stores.

In this model the storekeeper provides the customers with a Web-based interface through which the customer can browse the inventories of the store and order goods. After receiving the order, the storekeeper takes care of picking the goods from the shelves and has them delivered to the customer or puts them at a take-out spot. This model offers the grocery store a new channel for marketing (advertising and feedback methods), finance (online payment), ordering and distribution but does not have a big effect on the supply chain as a whole. The firm cannot compete on the basis of low prices since picking goods from the store shelves is very inefficient. New personnel have to be hired to do it, which results in additional costs.

ALBERT HEIJN

Albert Heijn is the largest supermarket chain in the Netherlands with 670 locations. The chain is owned by Royal Ahold, an international multi-channel food provider and majority owner of Peapod and Disco. Albert Heijn began offering a remote grocery ordering service in 1986. Before Internet-based service, customers were able to order from their homes or workplaces by telephone, fax or computer modem, using a special Windows-based Teleshopper-application. The Internet-based EGS now offers a selection of about 7000 products. Albert Heijn uses an advanced distribution system. Suppliers deliver the goods straight to one of about 13 distribution centers in the Netherlands. The distribution centers collect the orders from individual stores and transport the goods to the stores daily. The customer picks up the goods from a nearby supermarket, or has them delivered at home between 9 AM and 9 PM on weekdays, and between 9 AM and 5 PM on Saturdays. The minimum order is NLG 70, and the delivery fee is NLG 6 from Monday to Thursday noon, and NLG 9 from Thursday noon to Saturday. The EGS-services are available in most, although not all, areas of the Netherlands.

Disco

Disco is Argentina's leading urban supermarket chain with 213 stores, many located in Buenos Aires. Disco, like Albert Heijn (above) and Peapod (below) is owned by Royal Ahold. The company also operates convenience stores under the Mini Sol name and produces private-label products (Bell's). Disco started using the Internet in 1996 to provide extended services to customers. The Internet shopping service complements the home-delivery each store offers its local customers. The elaborate Web-site allows customers to browse through Disco Virtual, surf the electronic aisles, look at information about the products, make their purchases, and even view the Disco television commercials. Orders can also be placed by telephone. The goods are picked up or delivered from a local store. Delivery fees for home delivery from the local

branch of the chain or in-store pickup of an Internet based order all carry the same fee of Ps 3 per order.

SMALL SCOPE AND VIRTUAL STRUCTURE

Ruok@net

Ruok@net was the first Finnish electronic grocery store. Established in 1997, it operates independently from wholesalers, although it purchases products from cash-and-carry retailer, Kesko Noutotukku. Ruoka.Net is not connected with any brick-and-mortar store but it buys and picks its goods from the warehouse of Kesko, a major Finnish wholesaler. Ruok@net outsourced distribution to JW Lähetit, a courier company. Its delivery areas are extensive in the Helsinki area. Delivery hours are relatively long: 8-9 AM and 11.45 AM - 7.30 PM, from three delivery points. Minimum purchase is FIM 50 and standard delivery fee FIM 39.

Streamline

As a private U.S. company seeking to capitalize on the potential of online grocery retailing, Streamline received significant financial backing from major firms; Nordstrom (\$22.8 million in October, 1998), Intel, General Electric Capital, SAP America, PaineWebber and Reliance Insurance Co. (HighPoints, 1999)

Serving only the Boston market, Streamline generated estimated revenue of \$1 million in 1998. In 1999 the company entered suburban Maryland/District of Columbia market and anticipates expansion to Atlanta, Philadelphia, northern New Jersey, Chicago, Denver and Seattle by 2004.

Streamline's "quasi-Internet" business approach is unique and appears to have helped the company gain a competitive advantage. The business model emphasizes customer service, starting with the initial customer contact. New customers are visited by a Streamline Team that installs a Streamline Box (a weatherproof, integrated refrigerator, freezer, shelving unit with lockable keypad), trains the customer to use the browser-based interface, and sets up the customer's own Personalized Shopping List (PSL). Streamline delivers orders on a specified day even if the customer is not home. This delivery process earned the company a 94-98% customer-retention rate (Supermarket News,

1999). Despite the considerable switching cost to obtain new customers in its business model, Streamline garners competitive strength from its local network of quality purveyors, 1-to-1 marketing, and investment capital from large firms.

Streamline's business model is geared towards quality service, customer satisfaction and community orientation. Specific elements of this strategy include:

- Targeting the niche market of busy urban families, as well as stay-home mothers.
- Partnering with local quality purveyors such as Starbucks, Blockbusters, film processing and dry cleaning services, and area restaurants.
- Providing personalized service. For example, customers can choose how ripe they like their bananas, or receive product substitutions, such as blueberry yogurt in lieu of strawberry.

Adherence to its business model created certain burdens for Streamline. Specifically, the model is very capital intensive and initially very time-consuming (witness the 5-year expansion plan). Moreover, it is not yet known whether this model is profitable in its core operations. It is quite possible that Streamline may face increasing threats from firms with more scaled down, leaner operations in the future.

Shoplinc

Headquartered in Massachusetts, Shoplink offers services in Massachusetts, Connecticut, and New York. ShopLink.com provides groceries, household consumables and home concierge services, offering more than 15,000 non-perishable products from local sources.

First deliveries were made in 1997, and by early 2000, Shoplink served more than 100 suburban communities in Massachusetts, and 57 in Connecticut and New York. Seventy percent of the ShopLink.com customer base in the Boston area orders weekly and spends an average of \$100 per week on groceries. Logistics are based on multiple products delivered via company

owned fleet of vehicles. Members need not be home to receive product, but signing up for weekly delivery provides the customer with an on-site delivery container. The unattended delivery to customers' residences is available with Chill Containers™ that maintain product temperatures for more than 24 hours.

MULTIPLE SCOPE AND VIRTUAL STRUCTURE

Peapod

Peapod, founded in 1989 as an online service, was America's first Internet grocer. The current EGS provides an interface of a virtual supermarket as well as personalized shopping and delivery services. Customer service is also provided by telephone and email support. Peapod has over 100,000 members in the United States. The Peapod service is offered in eight markets nationally: Chicago, San Francisco/San Jose, Columbus (OH), Boston, Houston, Dallas, Austin, and Long Island (Hoovers, 2000).

One of Peapod's initial competitive differentiations was that they offered all food products, including perishable items, and they have exclusive partnerships with local brick-and-mortar grocery retailers. These partnerships ensured Peapod of inventory (product), and allowed the company to build orders without the overhead of owning warehouses in each local market. However, this sourcing of product proved unprofitable, forcing Peapod to shift its fulfillment to locally centralized warehousing to satisfy increasing consumer demand, ensure high quality service and reduce its cost structure (Peapod, 1999). They opened new distribution centers in two of their eight urban markets and a third center was under construction in mid-2000.

Peapod's technology is central to its business model, and integrates proprietary and commercial systems that are tailored specifically to the consumer direct business. They also help consumer goods companies through advertising, Internet couponing and product research by linking together members from multiple markets into a national online network.

Peapod went public in 1997. 1998 revenues were \$69 million, with a \$21 million loss. Revenues are derived from product sales, member and retailer

fees, interactive marketing (advertising) and licensing, including maintenance and licensing fees earned from licensing the company's software to Coles Myer Ltd. in Australia. 1999 figures showed Peapod with losses of \$29 million on revenues of \$73 million. In April 2000 Royal Ahold, the international food provider headquartered in the Netherlands and Peapod, Inc. entered into definitive agreements creating a mutually beneficial partnership. Under the agreements, Peapod continues as a stand-alone company and Ahold will supply Peapod with goods, services and fast pick fulfillment centers. Ahold initially invested approximately \$73 million.

NetGrocer

NetGrocer is positioned in the United States as a national cyber-superstore, not just an online grocer. In addition to the grocery portion of the business, NetGrocer offers medicine, gifts, books, music, and computing supplies. Their business model is similar to that of Amazon.com, in that they use a central warehouse scheme and outsource their distribution to Federal Express. Outsourcing allows them to keep a tighter control on costs with lower overhead. One of their major obstacles is that although NetGrocer delivers nationally, the company does not offer perishable foods. NetGrocer is privately held and estimated revenues were between \$20-\$30 million in 1999. Like its competitors, NetGrocer does not yet show a profit. The company has aligned with powerful partners, such as AOL, and received significant financial backing from Cendant.

Webvan

Founded by Louis Border (of Border Books) in the San Francisco Bay area, Webvan allows urban customers to place their order online 24 hours a day, 7 days a week and select a convenient delivery time. Orders are hand-delivered to the customer at the specified location and time. Webvan claims their prices, on average, are 5% less than in local grocery stores. Delivery is free for orders over \$50.00.

Webvan developed its business model by trying to blend the best concepts of the online and traditional modes of business. It combines ease of

use (the Web site), state-of-the-art inventory-management, and a fleet of delivery vans to operate its business. Borders assembled a team of experts in service, logistics, software development, and grocery retailing to run Webvan's operations. The company has strong financial backing from CBS Inc., Knight-Ridder Co., and several venture capitalists, including Benchmark Capital.

WebVan's early approach to the market was to manage the final mile with a fleet of vehicles that would make deliveries on a continuing basis to all locations within a 50-mile radius. Logistics problems and the lack of a clear indication of the economics of this delivery mechanism hampered the development of WebVan. In June 2000 Webvan agreed to buy HomeGrocer.com, an online grocery delivery service based in Washington state, for \$1.2 billion in stock. Sales for 1999 passed \$13 million, but losses still are running at nearly \$140 million.

Greengrocer.com

Greengrocer.com was the first Australian firm to be a purely online electronic grocer, starting in Sydney in 1999. Greengrocer.com is expanding throughout Australia and increasing the product range from just bread, fruit and vegetables to include meat, seafood, poultry, and dairy products. It claims that its main advantage over traditional retailers is its e-commerce system, which was built from scratch and thus did not need to accommodate outdated, conventional supply and distribution systems. Currently operating in Sydney and Melbourne, Greengrocer.com purchases premium quality produce fresh from the markets every morning and delivers to customers in the afternoon for orders placed on their website by midnight the day before. Each order is individually picked by Greengrocer.com staff. Orders are individually wrapped and packed into cartons or Chilltainer. Charges for delivery vary depending on time, need for refrigeration and location. Delivery costs are free to consumers with orders over A\$75 and range from A\$2-4 on other orders.

VII. DISCUSSION

Our cases suggest the online grocery market involves two types of firms:

1. New ventures by Internet entrepreneurs
2. Existing grocers entering into the online space.

A market opportunity analysis for both these scenarios is given in Table 5.

Table 5. Market Opportunities Analysis of EGS vs. Established Brick and Mortar Grocery Retailers

EGS	
Opportunities	Challenges
Local market benefits	Buyout by larger firms
Ancillary services opportunities	Consumer behavior patterns
Brokering	Unproven logistical model
Niche markets (e.g., natural foods)	Logistically “difficult” products
High population-density areas	Tough to differentiate firms on Internet
Convenience market pays more	Traditional channels improving their value propositions
Value chain disintermediation	Traditional channels have significant financial backing
Bonuses/loyalty programs	Limited selection
Established Brick and Mortar Grocery Retailers	
Opportunities	Challenges
Local market benefits	Behavior patterns (impulse purchases)
Ancillary services opportunities	Differential pricing
Convenience market pays more	Logistical model
Physical presence can be leveraged	Marketing strategies are unclear
Provide local customer service	Additional operating costs (trucks, labor)
Bonuses/loyalty programs	Build-up of individual orders hard to handle

EGS

Online retailers need to build customer awareness and may be more interested, at least initially, in customer acquisition and revenue growth than profitability. EGS models are often predicated on issues of control and cost with an expectation that cost savings can be generated through a reengineering of the supply chain for grocers. These expectations are reflected in most of the United States examples.

Supply chain management is a critical focus for these models. Wholesalers provide an important aggregating function for the industry. Distribution centers are critical for effective distribution. The model for online grocers changed the focus of delivery from pallet-size connections between

distribution centers and grocery stores to an individual delivery level at the individual consumer's home or business. Difficulties in making the logistics sequence efficient and profitable continue to nag the early pure electronic grocery shopping services. The logistics sequence is based on a distributor's model, with central warehouses serving specific regional delivery zones.

Internet-only grocers are establishing alliances with grocery wholesalers to shorten the value chain. The costs of running an Internet grocery business can be reduced significantly if supply channel costs are reduced. This model was adopted, for example, by Webvan. Webvan invests substantially in state-of-the-art distribution centers to coordinate the distribution function and save costs through automated order management and stock picking. The projections in cost savings suggest handling the volume of four supermarkets for the cost of one (Howell, 2000). Additional savings include inventorying only what is needed to replenish current orders, producing a higher "turn" rate of goods and resulting in less "shrink," or product waste. Additional efficiencies include lower costs for real estate for warehouse facilities and fewer employees (Howell, 2000).

The shortened value chain is offset to some extent by the cost of delivery to end-users. The cost for picking, packing and shipping of online orders appears to be exceed the average delivery charge of \$8-9. Depending on labor costs, the actual costs to the EG can be as much as \$20 per online order (Tillett, 2000). However, this amount is larger than can be passed directly on to the consumer through a direct delivery fee. A shortened value chain for Internet grocers will make delivery to consumers a greater proportion of the their cost. The types of delivery service available and the efficiency of these services will play a major role in defining the margins available in the Internet-only business.

ESTABLISHED BRICK AND MORTAR

The larger, more traditional retailers know that 'setting-up-shop' on the Internet is not as simple as establishing a Web site and taking credit card details. The traditional retail grocers, being established companies, unlike Internet start-ups, have an established customer base, brand image, and reputation. Many of

the European examples attempt to leverage the existing reputation as well as logistics assets by extending the presence of existing grocers into the electronic space.

Strategies such as customer profiling, customer feedback, customer surveys, and tailored product / serving offerings potentially add value to grocers with online channels since these capabilities are not readily available via the traditional grocery channel. Concurrent offerings can also be incorporated into the online sites at much lower costs and in faster time frames.

Efficient supply chain management for established grocers, linked by technology, are critical to improved margins, delivering reduced costs and further improving efficiencies (Palmer, 2000). Electronic connectivity between wholesalers and retailers forged ahead in the mid to late 1990's, primarily in the area of ordering, invoicing, credit, and settlement of payments. High technology distribution centers were established to reduce cost and reduce inventory. These infrastructure investments also offered opportunities for establishing a hybrid strategy -- an online presence as an adjunct to physical stores.

Moving to the electronic channel may, in fact, create some cannibalization of existing grocery market share. Of greater concern is the possibility the electronic channel moves customers to an even lower margin channel. The lower margins are created by the model in which the established chains are forced to work around "large brick and mortar" investments that do not accommodate online ordering. The online ordering also does not take advantage of impulse purchases as readily as in-store displays. Finally, the considerable logistics costs of picking, packing and sometimes delivering orders suggest that little value is currently being added to traditional grocery operations through the Internet. Traditional grocery chains would appear to have two options:

1. to construct efficient delivery systems for online goods or
2. use the existing network of "brick and mortar" assets to provide a pick up point for consumers who have ordered on line (thus eliminating an expensive part of the value chain).

THE KEY LOGISTICS ISSUES AND SOME POSSIBLE SOLUTIONS

Regardless of the business model used to enter the EGS market, the groceries must be delivered to the customer. Home delivery services are one approach, but present both a cost and a capacity issue. Larger volumes may be achieved using other mechanisms.

One of the biggest challenges facing EGS is related to the nature of groceries. A common shopping bag consists of dry, fresh, frozen and liquid groceries. The crucial issues are:

- How to manage the storage of these different products of different temperature requirements
- How to make sure that the perishables are fresh and the ice-cream hasn't melted if the groceries are picked up by the customer several hours after the goods reach the delivery point

One possible solution to these problems is creating a transportation/packaging module that could be used every time a customer transports groceries home. The module would provide specially made compartments to handle both frozen groceries and dry/fresh items.

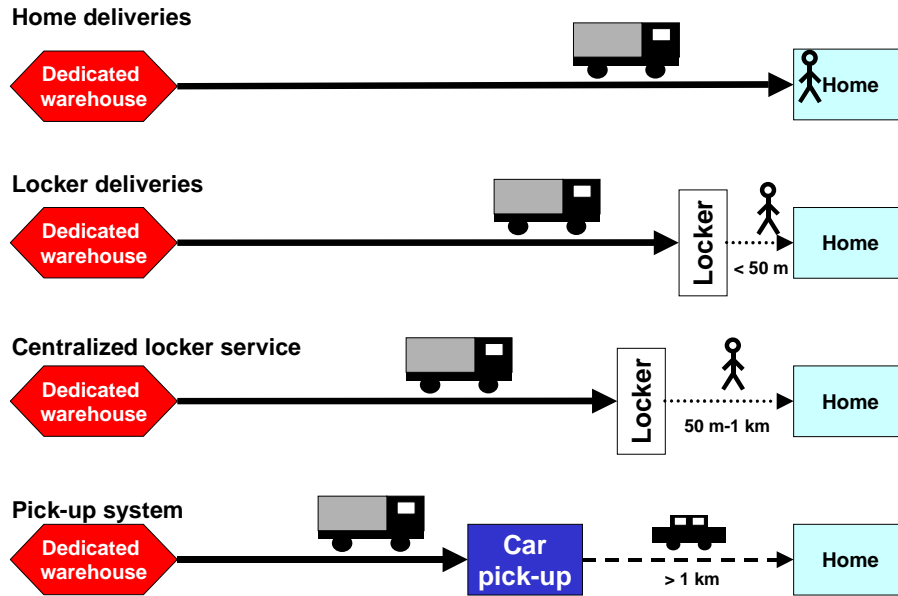
Another technological development is the "intelligent refrigerator" introduced in March 1999 by Frigidaire Home Products (Banaghan, 1999). This product prototype is equipped with a microprocessor, touch screen, bar-code scanner and communications port, which allow consumers to automate their shopping. Thus, whenever someone is low on a given product, they simply swipe the carton past the refrigerator's bar-code scanner. The refrigerator can be connected to the Internet via a standard phone line or to an Ethernet network. This technology has been technically viable for some time (Banaghan, 1999).

In mid-2000, deliveries are made from a variety of locations including distribution centers, warehouses and grocery stores. Some EGS built dedicated warehouses to decrease back-end infrastructure costs (Howell, 2000). The current delivery options include:

1. Deliver groceries directly to customer homes

2. Deliver groceries to customer-specific lockers located either in a specific room downstairs in an apartment house or in a separate small premise in a residential area.
3. Deliver to a local enterprise such as a kiosk or gas station as a service center. Existing buildings need to be renovated, because either lockers or other boxes have to be built. The costs, however, would not be as high as they would if the investment were made in a separate building. Variable costs may not be as high, because some staff is already employed. This arrangement provides some potential for overlapping the activities in support of both the online orders as well as the preparations for deliveries to the physical grocery store. However, if service hours of the company have to be extended to enable different customer groups to use the new delivery model, variable costs may increase. This delivery option, still, can be more cost efficient than an EGS option operated from an existing discount store or supermarket, because orders can be collected from a dedicated warehouse.
4. Deliver to pick-up stations, drive-in points or “pit-stops” where customers can pick up the their groceries. This option requires high investments into location and equipment, and personnel costs may be high.

The feasible delivery models which seem to emerge are presented in Figure 3 and are classified on the basis of distance from consumers' homes (Kallio, Kempainen, Tarkkala, Tinnilä, 2000).



Note: 1 meter ~ 3feet

Figure 3. Potential Logistical Models for Home Delivery for EGS

VIII. CONCLUSIONS

Several competing models appear to be emerging in electronic grocery shopping. Each has a slightly different approach to the product line, retail/wholesale channel management, and delivery fulfillment mechanism. European, Australian and South American models typically use the EGS as an extension of an existing grocer while U.S. models attempt to reengineer the supply chain and often replace and compete with existing grocers.

Non-U.S. approaches seem to take greater advantage of existing physical infrastructure, incorporating warehouse distribution capabilities as well as in-store options for customer pick-up.

- The Royal Ahold grocers, including Albert Heijn and Disco use the electronic version of their catalogs to extend the reach of the grocer and to make shopping more convenient for existing customers
- Several firms including Ykköshalli and ICA extend the electronic shopping option only to existing loyal customers who use the firm's affinity card

- Delivery fees and order times vary widely
- Options for current physical chains include distribution mechanisms as well as in store collection. Additional logistics possibilities include "pit stops", kiosks, or other physical distribution points

In contrast, models prevalent in the United States concentrate on improving logistics and delivery to the customer. Examples include:

- NetGrocer offers a limited product line, uses its own warehouses and FedEx delivery
- Peapod offers a full product line, uses local grocery stores and provides fee-based delivery
- ShopLink uses its own vehicles, builds regional distribution facilities, and selects from products available through local vendors
- Streamline has a full product line, alliances with local partners, and provides subscriber/members on-site equipment to handle delivery
- WebVan offers a large product line, involving existing grocers, sophisticated distribution centers, and an extensive company-owned delivery infrastructure

A critical question is which model of the value chain will provide the most compelling efficiencies generating customer loyalty and continuing profits. The total cost of shopping by consumers is certainly a factor and depends on how the individual consumer develops the equation for attributing travel, shopping, and product costs. Total expenses for grocers using different models will vary depending on the elements of the value chain included. Some will pay more for the picking, packing and delivery while others will incur costs of operating physical stores. Some advantage may be available to those firms overlapping picking and packing operations. Larger chains and cooperatives may also benefit from economies of scale, and some direct-to-customer models can take advantage of lower wholesale prices.

The main advantage of the internet-only stores is high accessibility for those consumers that have Internet connection from both home and office. EGS

firms need to develop and exploit economies of scale by higher market penetration to reduce their fixed costs/revenue ratio and better utilize their existing distribution channel. New alliances and integration with traditional grocers or wholesalers may also provide opportunities through access to fulfillment processes and automated warehouses. While the challenges remain difficult, the numerous business models and approaches to EGS suggest the likelihood that a solution will emerge.

Editor's Note: This article was received on June 28, 2000. It was with the authors for approximately one month for revision. It was published on _____

REFERENCES

EDITOR'S NOTE: The following reference list contains hyperlinks to World Wide Web pages. Readers who have the ability to access the Web directly from their word processor or are reading the paper on the Web, can gain direct access to these linked references. Readers are warned, however, that

1. these links existed as of the date of publication but are not guaranteed to be working thereafter.
2. the contents of Web pages may change over time. Where version information is provided in the References, different versions may not contain the information or the conclusions referenced.
3. the authors of the Web pages, not CAIS, are responsible for the accuracy of their content.
4. the authors of this article, not CAIS, are responsible for the accuracy of the URL and version information.

Banaghan, M. (1999) "Retail Struggles to Cross the Cyber Divide,"
Business Review Weekly, July 30.

<http://www.brw.com.au/newsadmin/stories/brw/19990730/3103.htm>.

Bloomberg Financial Database (1999) "Dow Jones News," Ann Keeton,
April 9.

BusinessWeek (1998) "The Meat and Potatoes of Online Shopping?"
December 7, pp. 45.

Dot.com (1998) "Billions Seen for Web Grocery Sales," August 1, pp.
16-17.

eStats (1999) Internet Traffic.
http://www.emrketter.com/estats/net_geography_exp.html (current July 1, 2000)

Food Marketing Institute (1999) *Supermarket Research*, January/February.

Heikkilä, J., J. Kallio, T. Saarinen, and V.K. Tuunainen (1998a) "Grocery Shopping for Elderly and Disabled: Finnish EC Experiments," *International Journal of Electronic Markets*, 8(7), pp.17-19.

Heikkilä, J., J. Kallio, T. Saarinen, and V.K. Tuunainen (1998b). "Analysis of Expectations on Electronic Grocery Shopping For Potential Customer Segments", *Australian Journal of Information Systems*, Special Issue, 1998, pp.56-69.

High Points (1999) "Door-to-Door Service -A brief overview of Streamline," 6 (2), pp. 50.

Hoovers Online (1999). Grocery and Food Distribution Industry Snapshot, V. Pearcy. <http://www.hoovers.com> (current July 1, 2000).

Hoovers Online (2000). Peapod Company Capsule. <http://www.hoovers.com> (current July 1, 2000).

Howell, Debbie (2000) "The Grocer with a Business Plan that Delivers," *Discount Store News*, May 8, 39 (9), pp. 117.

Impola, H., S. Köykkä, K. Nyman, and T. Valento (1998) "Electronic Grocery Stores and Their Services on the Internet", Working Paper, LTT-Research Series , Helsinki. ISBN 951-774-034-4

Kallio, J., T. Saarinen, M. Tinnilä, and V.K. Tuunainen (2000) "Business Model for Electronic Commerce: Analysis of Grocery Retailing Industry," in Hansen, R.H., Bichler, M & Mahrer, H. (eds), *Proceedings of the 8th European Conference on Information Systems, ECIS 2000 A Cyberspace Odyssey*, Volume 2, pp.1037-1044, Vienna University of Economics and Business Administration.

Kallio, J., K. Kemppainen, M. Tarkkala, M. Tinnilä (2000) "New Distribution Models for Electronic Grocery Stores," Working Paper, LTT-Research Series, Helsinki. ISBN 951-774-055-7

Kallio, J. , T. Saarinen, and V.K. Tuunainen (1997) *Elektroninen kaupankäynti päivittäistavarakaupassa – potentiaaliset kuluttajaryhmät, jakeluratkaiseut, rakenteet ja työllisyysvaikutukset* (Electronic Commerce in Grocery Shopping – Potential consumer groups, forms of delivery, structures and employment effects) LTT Research Series B-137 (in Finnish), Helsinki.

Kirby, J. (1999) "Market share: Supermarkets in a double-bind," *Business Review Weekly* (Australia), March 29.

Communications of AIS Volume 4, Article 3
Online Grocery Shopping Around the World: Examples of Key Business Models by J. Palmer et al.

<http://www.brw.com.au/newsadmin/stories/brw/19990329/1686.htm> (current July 1, 2000)

LaPlante, A. (1999) "Battle for the Fridge", *Wired*, Apr, 9

<http://www.cnn.com/TECH/...9904/09/fridgechip.idg/index.html>(current March 1, 2000)

Palmer, J. (2000) "Building a New Infrastructure," *Food Logistics*, July/August supplement, pp. 22-24.

Peapod (1999) 10-K Report, filed March 30.

Schwartz, E.I. (1997) "The Progressive Grocer", *Wired*, Sep, 5.

<http://www.wired.com/wired/archive/5.09/grocer.html> (current March 1, 2000)

Shook, C. (1998) "Lettuce by Modem," *Forbes*, January 12

<http://www.forbes.com/Forbes/98/0112/6101160s1.htm> (current March 1, 2000)

SuperMarket News (1999) "Online Grocers Cited as Model," 49 (3), p. 48.

Tillett, L. (2000) "Shortcut To The Web," *Internetweek*, April 24, pp. 1

Tuunainen, V.K. (1999) *Different Models of Electronic Commerce – Integration of Value Chains and Business Processes*, Dissertation thesis, Helsinki School of Economics and Business Administration.

Van Heck, E. (1998) "Electronic Grocery Shopping in the Netherlands," Presentation at the *Electronic Grocery Shopping (EGS) Workshop*, Helsinki School of Economics, Electronic Commerce Institute, Helsinki, Finland, 16 December.

APPENDIX

DETAILS OF EGS CASES

Albert Heijn http://www.ah.mi		
Revenues and Fees	Geography	Business Elements
Total annual sales \$5.3 B Minimum order, NLG 70, delivery fees range from NLG 6 - 9	Netherlands	<ul style="list-style-type: none"> • Extend reach of chain • Expand remote service begun in 1986
Coles Myer http://www.colesmyer.com.au		
Revenues and Fees	Geography	Business Elements
Total company revenues of A\$20.5 billion Minimum order of A\$60, A\$12 delivery fee	Australia and New Zealand	<ul style="list-style-type: none"> • Pursuing differentiation on product range, quality service, freshness, image and value • Limited offers online • Harris Technology capabilities
Disco www.disco.com.ar		
Revenues and Fees	Geography	Business Elements
Total annual sales Ps 1.85 B. Delivery fee Ps 3	Major cities in Argentina	<ul style="list-style-type: none"> • Extend reach of chain • Utilize existing stores and distribution infrastructure
Greengrocer.com http://www.greengrocer.com		
Revenues and Fees	Geography	Business Elements
1999 initial year, A\$2 M Minimum order A\$25, free delivery over A\$75, charges for location and refrigeration (A\$2- 4)	Sydney and Melbourne	<ul style="list-style-type: none"> • Added service, convenience • Build brand awareness and market share • Limited selection
ICA www.maxi.arlanda.ica.se		
Revenues and Fees	Geography	Business Elements
Delivery fee SEK 125, in-store pickup SEK 55. Must be cardholder	Stockholm	<ul style="list-style-type: none"> • Extend reach of chain • Extend/support loyalty program
NetGrocer http://www.netgrocer.com		
Revenues and Fees	Geography	Business Elements
1999 sales \$8 M, probably heavy losses, initial IPO postponed Delivery fee based on order amount (e.g. \$60 order is \$6)	National	<ul style="list-style-type: none"> • FedEx delivery • Non-perishables only • Relunched web site in Feb 1999 • One warehouse services the entire national market

Peapod http://www.peapod.com		
Revenues and Fees	Geography	Business Elements
1999 \$73 M revenue, \$27 M in Losses Delivery free for orders over \$60, otherwise \$7.50	8 urban markets w/ full service. National w/ very limited service. Full- service national expansion planned	<ul style="list-style-type: none"> • Food products and some services • In 1999 moved to a warehouse based distribution model • Publicly-held company • 1-1 marketing.
Ruokamarkkinat Oy www.ruokarasti.net		
Revenues and Fees	Geography	Business Elements
Delivery fee FIM 40, in-store pickup is free	Major cities in Finland	<ul style="list-style-type: none"> • Extend existing reach of chain • Grow market and acquire new customers
Ruok@net www.ruokak.net		
Revenues and Fees	Geography	Business Elements
Minimum order FIM 50, delivery fee of FIM 39	Helsinki	<ul style="list-style-type: none"> • Independent of wholesalers and retailers • Outsource delivery to courier service
ShopLink www.shoplink.com		
Revenues and Fees	Geography	Business Elements
1999 sales \$18 M, initial private financing of \$50 M Monthly fees (\$25 for weekly, \$39 for additional delivery and unpacking)	MA, CT, NY	<ul style="list-style-type: none"> • Unattended direct delivery via Chill Containers™ • Suburban delivery area • Home delivery services through company owned vehicles • Two current warehouse facilities
Streamline http://www.streamline.com		
Revenues and Fees	Geography	Business Elements
1999 \$15.4 M (up from \$6.9 M), losses \$20 M \$30 monthly fee for weekly delivery	Boston only. Planning to go into 8 urban markets by 2003.	<ul style="list-style-type: none"> • “Quasi-‘Net” Business Model includes Streamline box & startup team • Service/quality oriented with comprehensive services • Local partners with quality purveyors
WebVan http://www.webvan.com		
Revenues and Fees	Geography	Business Elements
1999 was first year, initial sales of \$13 M with net losses of \$144 M Delivery fees (free for orders over \$50)	4 major US urban markets. Planning to go into multiple urban markets. 50 mile radius	<ul style="list-style-type: none"> • Technocentric, internal delivery, 30 min windows • Very service/quality oriented • Solution for the last mile
Woolworths http://www.woolworth.com.au		
Revenues and Fees	Geography	Business Elements
Total company revenues of A\$15.4 billion Minimum order of A\$50, 7.5% handling fee, A\$6 delivery fee	Australia	<ul style="list-style-type: none"> • Pursuing differentiation on quality, service, freshness, image and value. • Limited offers online • Very service/quality oriented

Ykköshalli http://www.yhalli.fi		
Revenues and Fees	Geography	Business Elements
Home delivery fee FIM 40, in-store pickup fee FIM 20. Must have membership card	Helsinki	<ul style="list-style-type: none"> • Extend existing physical stores • Convenience • Common layout

ABOUT THE AUTHORS

Jukka Kallio (MSc) is the Director of the Electronic Commerce Institute at the Helsinki School of Economics. He has published in many major conferences and such journals as *Information, Technology and People* and the *Journal of Strategic Information Systems*.

Jonathan W. Palmer (PhD) is Assistant Professor of Decision & Information Technologies at the Robert H. Smith School of Business of the University of Maryland, College Park. His current research interests include the strategic use of information technology, electronic commerce, and virtual organizations. His work has appeared in a number of leading journals including *Information Systems Research*, *Communications of the ACM*, *Journal of World Business*, *Journal of Computer Mediated Communication*, *Journal of AIS*, *JASIS*, *European Management Journal*, and *The Information Society*. He serves on the editorial board of *International Journal of Electronic Markets*.

Timo Saarinen (PhD) is the professor of Electronic Commerce at the Helsinki School of Economics, Finland. He has published widely, e.g. in *Information & Management* and *Journal of Management Information Systems*.

Markku Tinnilä (Ph.D.(Econ.)) is a research fellow of the Academy of Finland and a project manager at the Electronic Commerce Institute of Helsinki School of Economics. His research focuses on electronic commerce, and development of service and business processes. He has published in the *Journal of Strategic Information Systems*, *Business Process Re-engineering & Management Journal* and *International Journal of Service Industry Management*.

Virpi Kristiina Tuunainen (Ph.D. (Econ.)) is professor of Information Systems and a senior researcher at the Electronic Commerce Institute of Helsinki School of Economics. She has been a visiting researcher at the Business School

and at the Department of Computer Science of University of Hong Kong. Her research focuses on electronic commerce, inter-organisational information systems and economics of IS. She has published articles in *MIS Quarterly*, *Journal of Management Information Systems*, *Information & Management*, *Journal of Global Information Technology Management*, *International Journal of Electronic Markets*, *Australian Journal of Information Systems*, *Information Technology and People*, and *Scandinavian Journal of Information Systems*.

Eric van Heck (PhD) is an Associate Professor at Erasmus University's Rotterdam School of Management. He teaches e-Commerce in the executive and MBA courses. He leads a research program on the impact of eAuctions. Dr van Heck publishes in leading journals (e.g., *Communications of the ACM*, *Harvard Business Review*, *Information Systems Research*, and *Wirtschaftsinformatik*) on electronic markets and electronic flower auctions and serves on the editorial board of *Electronic Commerce Research* and the *Journal of Information Technology*. He holds a Ph.D. from Wageningen Agricultural University. Previously, he worked for Cap Gemini, Wageningen Agricultural University, and Tilburg University.

Copyright ©2000, by the [Association for Information Systems](#). Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and full citation on the first page. Copyright for components of this work owned by others than the [Association for Information Systems](#) must be honored. Abstracting with credit is permitted. To copy otherwise, to republish, to post on servers, or to redistribute to lists requires prior specific permission and/or fee. Request permission to publish from: AIS Administrative Office, P.O. Box 2712 Atlanta, GA, 30301-2712 Attn: Reprints or via e-mail from ais@gsu.edu.



EDITOR
Paul Gray

Claremont Graduate University

AVIS SENIOR EDITORIAL BOARD

Henry C. Lucas, Jr. Editor-in-Chief New York University	Paul Gray Editor, CAIS Claremont Graduate University	Phillip Ein-Dor Editor, JAIS Tel-Aviv University
Edward A. Stohr Editor-at-Large New York University	Blake Ives Editor, Electronic Publications Louisiana State University	Reagan Ramsower Editor, ISWorld Net Baylor University

CAIS ADVISORY BOARD

Gordon Davis University of Minnesota	Ken Kraemer University of California at Irvine	Richard Mason Southern Methodist University
Jay Nunamaker University of Arizona	Henk Sol Delft University	Ralph Sprague University of Hawaii

CAIS EDITORIAL BOARD

Steve Alter University of San Francisco	Tung Bui University of Hawaii	Christer Carlsson Abo Academy, Finland	H. Michael Chung California State University
Omar El Sawy University of Southern California	Jane Fedorowicz Bentley College	Brent Gallupe Queens University, Canada	Sy Goodman University of Arizona
Ruth Guthrie California State University	Chris Holland Manchester Business School, UK	Jaak Jurison Fordham University	George Kasper Virginia Commonwealth University
Jerry Luftman Stevens Institute of Technology	Munir Mandviwalla Temple University	M.Lynne Markus Claremont Graduate University	Don McCubbrey University of Denver
Michael Myers University of Auckland, New Zealand	Seev Neumann Tel Aviv University, Israel	Hung Kook Park Sangmyung University, Korea	Dan Power University of Northern Iowa
Maung Sein Agder College, Norway	Margaret Tan National University of Singapore, Singapore	Robert E. Umbaugh Carlisle Consulting Group	Doug Vogel City University of Hong Kong, China
Hugh Watson University of Georgia	Dick Welke Georgia State University	Rolf Wigand Syracuse University	Phil Yetton University of New South Wales, Australia

ADMINISTRATIVE PERSONNEL

Eph McLean AIS, Executive Director Georgia State University	Jennifer Davis Subscriptions Manager Georgia State University	Reagan Ramsower Publisher, CAIS Baylor University
---	---	---