

# INTERNATIONAL JOURNAL OF RESEARCH IN COMPUTER APPLICATION & MANAGEMENT

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**ELECTRONIC GROCERY SHOPPING: MODELS AND METHODS FOR THE URBAN CONSUMER DELIGHT**

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**ABSTRACT**

*This paper deals with the issues related to computer-aided retailing. The paper reveals the "hidden topographical aspect" of e-commerce, considering how the outwardly easy act of delivering food and related items at the customer's doorstep is explained in urban form, and in transportation and communication infrastructures. The paper classifies Electronic Grocery Shopping (EGS) models into two types: "bricks and clicks", and the "infomediary", and scrutinizes how each type of function has been shown up in the urban setting, and the infrastructure upon which each draws. The paper then reflects on the strategies used during EGS operations to have used to compensate for the "killer costs" of logistics for e-commerce transactions. The paper wraps up by considering how electronic grocery shopping is connected to the consumer behavior trends, and how these trends are visible in the light of urban life. The paper put forwards the idea that online grocers are in the precursor of enterprises habituating customers to remote ordering and delivery of products to their homes. Through administering this "green mile", online retailers hope to extend the product offerings on a higher-margin and better manage the distribution of unprofitable products to the customers by combining the power of online medium like the Internet.*

**KEYWORDS**

electronic grocery shopping, urban consumer.

**INTRODUCTION**

Delivering food to the customer's doorstep has now become a classic model in food retailing. Even prior to the advent of the Internet, several food stores especially in the supermarkets and hyper-malls in Europe and America have been offering the services to their customers, either at no cost or at something nominal. The next big wave that's hit the online retail business platforms has been the development of a new way of conducting business known as Electronic Grocery Shopping (EGS). Several attempts have been made. Services offered before the advent of E-Commerce were restricted to a few miles within the radius of the Supermarket. These services were either confined to providing limited services on some fixed goods or some quite expensive goods, the delivery cost of which can be easily compensated from the size or value of the order itself and were transacted largely over phone or fax machines. The internet emerged with a promise to evade the costs of order complexity and time that besieged earlier home delivery services offered via television or the telephone (Jones and Biasiotto, 1999; Management Horizons, 1997; Reynolds, 2000). A traditional grocer with a virtual presence could prospectively offer a broader range of items than even the biggest of the store(s), at a cost much lower than was previously possible given optimum order volume to offer economies of scale and scope (Murphy, 2004), seen in the example of Amazon.com's assurance to be the "largest bookstore on earth" (Dodge, 2001). Thus EGS, like other virtual undertakings, was thought to precursor the "end of country's physical borders" (O'Brien, 1992; Cairncross, 2001; Thrift, 2001). The EGS transactions which exponentially increased during the dot-com bubble assumed that space constraints could be kerbed, and that "first-mover advantages" can be applied for online ventures (Liebowitz, 2002). According to Shapiro and Varian (1999: 169), 'If you can establish an installed base before the competition arrives on the scene, you make it difficult for later entrants to achieve the scale economies necessary to compete'. This can be achieved by building quick frameworks, tapping in customers quickly and thus capturing an incontrovertible market share. Being a bit loss-making was a result of the need to put up the necessary delivery logistics, particularly devoted to order fulfillment centers, along with Customer Relationship Management, but also fetched its own benefit: attention from the media.

This paper throws light on how funds & resources, the continually flowing affluences available for investing into business practices and places, has been "stranded" in the urbanized retail system, with specific emphasis on electronic commerce. In other words, how last couple of decades have witnessed the increase in awareness and usability of the internet by customers and online businesses have smoothly manifested in the city. A customer ordering online from his workplace and then finding the product being delivered at his residence without being concerned about the finer details about the Ordering Process, Pickup and Delivery Process is a prime feature of Electronic Shopping. In accordance with Currah's (2002) investigation of the material framework "in the wake of the web store" for Canadian general merchandise retailers, this paper intends to reveal the "hidden topographical aspect" of e-commerce, taking into account how the ostensibly easy process of delivering food at the doorstep is elucidated in urban setup, and in transportation and communication infrastructures. As Graham (2001: 409) noted, a detailed introspection in 'the manner in which technologies practices and urban business practices are deviously intertwined' is required. This paper puts forward an overview about the typological frameworks of online grocery shopping models and customers. It depicts contents based on the case studies from the UK, US, Canada, New Zealand and a few other countries having developed frameworks for online shopping using interviews with core participants, industry reports and media coverage to unravel the usually hidden substantiality of Electronic Grocery Shopping. However, not all e-commerce businesses are made alike, and the differences in organizational form and business practices have resulting disparate geographies. Hence this paper begins by reviewing various organizational models experimented by virtual retailers, and then assesses how these models have been made material in the urban fabric, both in fixed and fluid terms.

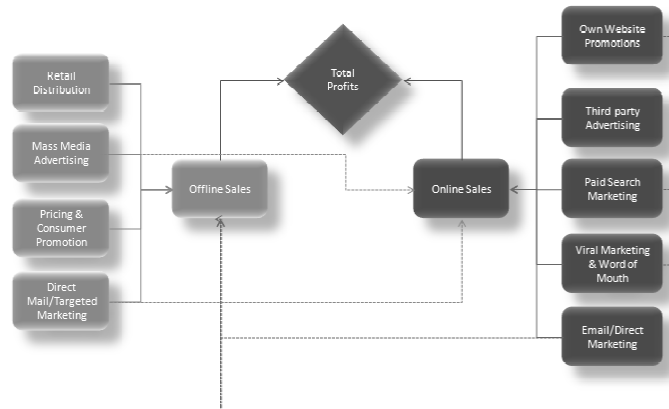
**E-GROCERY BUSINESS MODELS**

Two important and discrete computer-arbitrated retail formats can be determined from the numerous experiments that took place in the segment of internet-based home delivery of food during the late 1990s, although as always there are frequent variations (see Reynolds, 2000 for a nuanced view). Amongst all of these, the quickest and least expensive to implement is the so-called "bricks and clicks" method for in-store fulfillment, wherein an existing retailer makes use of its well established store network (Murphy, 2002, 2003; Currah, 2002; Oinas, 2002). The second option is for (generally small) existing retailers to sub-contract the web ordering and customer management functions to an intermediary (also termed an "infomediary", and in effect utilizes third-party logistics) (Mendelson, 2001a,b; Kämäräinen, 2001; Wrigley, Lowe and Currah, 2002) whose core function is to verify and approve the stock, order and deliver information between the customer and the retailer or its network of stores. A third and one of the most expensive methods is to build a custom-built e-commerce fulfillment warehouse (a "pure-play", if the retailer lacks the "bricks and mortar" store network) which is out of the scope of this paper.

**1. THE 'BRICKS & CLICKS' MODEL**

In the 'bricks and clicks' model the company integrates both offline and online presence for selling products or services. This model makes extensive use of telephone ordering. This model is an excellent option for companies which already have a very strong physical presence and image in the market and want to spread out their reach geographically to the customers by providing cost effective ordering and delivery services. The companies can also cut down on their capital expenditures of staffing and raising other office infrastructure by adopting such model. It has been seen that this model works better for organizations that are into selling of assorted goods like retail outlets and is less preferred by the others who have single or few offerings like car manufacturers. Figure 1 below depicts the integration of both, online and offline services and how they contribute to the organizations adopting the 'brick-and-click' formats.

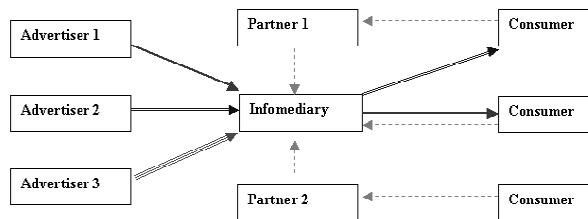
**FIGURE 01: BRICKS-AND-CLICKS MODEL**



**2. THE 'INFOMEDIARY' MODEL**

The second way of managing the electronic retailing business is the "infomediary" model (Hagel & Rayport, 1997; Kämäräinen, 2001; Wrigley et al, 2002). These are "pure-play" operations that do not actually handle the physical fulfillment, but they focus only on managing the link between customer and retailer. Infomediaries host the web applications and retail databases that lie behind the virtual storefronts, and pass on the orders to the retailer through email, fax or link to the store's database. The store then picks packs and delivers the goods. The benefit here to the store is the cost saved in developing own web presence and other marketing expenditures. The entire above process can be diagrammatically represented as shown in Figure 2.

**FIGURE 02: THE INFOMEDIARY MODEL**



**LOGISTICS: THE 'KILLER COSTS' OF E-COMMERCE**

The biggest challenge in the above two models lies in the logistical difficulties of getting products delivered to the customer's doorstep. EGS operators can provide two options to their customers for product delivery i.e. "In Attendance" or "Unattended"; the second option may come further with suboptions viz. "To the Home or Work Zone" or dedicated to a "Drop Zone". Aoyama (2001) elucidates the emergence of such nearby "Drop Zones" in Japan, where 7-11 stores play the role of receivers of goods, just as the local courier or postal outlets become the default outlet stores for Amazon.com and other bulky product shippers, if the customer is not present at home or wanting to get the product delivered to the third party destination. Currah (2002) and Wrigley et al. (2002) have taken a note of the case of www.empori.com, which acted as a counterpart of a post box outlet for hulking goods. Empori signed contracts with numerous e-tailers, who would in turn carry goods to a specific 'Secure Box' at the Empori outlet falling nearest to the customer's vicinity. The customer could then conveniently pick up the goods. Whereas this was a rewarding solution for computer products, music and books, although ultimately not an appropriate one – the company was forced to close down its operations by the year 2001 – it did not suit the transportation and delivery of perishable items. An unconventional alternative for unattended delivery was attempted by two companies' viz. Streamline of the US and Homeport from the UK, that involved setting up of 'Secured Box' at the customer's home location (Reynolds, 2000). The e-tailer would immediately add the selected items by the customer to an 'Insulated Box' and then deliver it to the customer at his convenience. Streamline would make the product deliveries during the night time, when the streets are less crowded; it would also lift and process clothes for dry cleaning, facilitate returning of rented video material etc. Homeport's systems turned out to be even more flexible, as additional 'Secured Boxes' can easily be added with no or little effort (but substantial expense). In spite of these significant efforts made, neither of these approaches is suitable for a bulky and an intermittent grocery shop. Nevertheless the company has connects with varied home delivery operators like FoodFerry, Sainsbury's, Greenwich Organics, Interflora and others.

To promote their quality of service and the necessities for food safety, most of the 'bricks and clicks' companies prefer or even resolute on attended delivery: this ensures that it becomes a paid delivery and also the frozen and preserved items do not blight out. However, talking directly to the customer and attentively getting the groceries inside significantly increases the "drop time" and declines the number of drops that can be achieved with a single delivery vehicle, to an average of 3-4 an hour (Kämäräinen, 2001; Mendelson, 2001; Caicco, 2001). Companies choosing the unattended method encounter more difficult choices: setup an insulated sealed box as done by Homeport, or find better ways to delay the spoiling of preserved food items. Companies like the Small Potatoes Urban Delivery of Vancouver has been partially able to surmount this problem by confining the categories of fresh foods sold upto frozen goods and very fresh organic produce, and offers chill-packs in plastic containers (both reusable) to cut down heat stress. This method may also not always be successful since few customers may just not unpack the containers even up to 8 hours after getting the delivery, for which an exact delivery slot cannot be specified.

**THE GROCER AND THE CITY: MATERIAL EFFECTS**

Food Retailers have been increasingly cautious about the distribution management part of their businesses, since it has direct financial implications on the margins (Mendelson, 2001; Caicco, 2001) for over two decades. As noted by Sparks (1994): 'logistics and systems became a significant frontier of cost-control activity and enhanced profitability in UK food retailing, as major firms progressed from simply being the innocent recipients of manufacturers' transport and storage whims, to controlling and organizing the supply chain, almost in its entirety'. "Bricks and mortar" food retailers have urbanized classily covertly "stranded"



infrastructure to play the role of an efficient mediator between the multiple suppliers and multiple customers. In the 1970s supermarkets required backroom areas to receive bulk-break and store product inventory prior to shelf restocking (Murphy, 2003; Wrigley and Lowe, 2002). Some of these inventories arrived directly from the manufacturers, but the bigger supermarket chains started putting together Distribution Centers (DCs) to serve groups of stores, for improving their net efficiencies. The augmentation of the size of stores in the mid 1980s and 1990s abridged the backroom space for individual stores, as DCs became more massive and advanced, designed to send single delivery vehicles to the retail stores to eliminate the job of coordinating with the manufacturer's deliveries. The present day regional level Distribution Centers cater to many stores through computerized "Continuous Replenishment" systems, and can range up to 700,000 sq. ft., which is over six times the size of the biggest hypermarket. The deliveries made by the manufacturers are captioned with the address of their destination stores and gross weights, with the pallet contents bulk-broken and re-routed to the store loading bays without onsite storage, through a process called "Cross-Docking" (Maloney, 2000; Wrigley and Lowe, 2002). Full-truck loads are then transported to the store, with preordered goods and pre-stacked for an effortless shelf display in roll-in cages. Hence the goods spent much lesser time in transit or in storage, thus fastening the turnover of retail capital and thickening retailer margins. The uniqueness of this business model lies in its economies of scale using larger trucks to deliver goods to larger stores using as few deliveries as possible at the fastest speed. Because of such a dedicated task being performed at the Regional Distribution Centers, they do not make up for any ideal assembly points for individual-customer orders to be home delivered. Thus for a single item, the entire range of products from the store may go through a series of multiple distribution centers.

In spite of all health and cleanliness measures, various frozen and preserved goods are co-transported (as evident in some DCs), along with meat, fish and bakery items, the breaking of bulk essential to supply to the individual customers may require all together separate sorting areas, with goods tied up in storage much longer. This would definitely be going against recent retail logistics trends (Murphy, 2003).

By introducing e-tailing fulfillment systems within their stores, existing retailers can capitalize on their already stranded infrastructure. Bricks and mortar retailers have devolved some of the most cumbersome and expensive processes of their businesses onto their customers: the picking, packing and delivery. Present day customers lack the know-how of calculating the full costs involved in actually getting to the grocery store (Kämäräinen et al., 2001), or the opportunity costs of their labour whilst there, which in many places includes bagging the groceries and in some even doing the scanning.

In the whole process of providing and extending these services to the customers, many e-tailers tend to add considerable fulfillment costs which many customers may be unwilling to pay. Customers tend to oppose the entrenchment of any delivery costs within elevated, since customers can easily cross verify the competitor's costs online or with any advertisements. The additional costs of home delivery must therefore be recovered by increased order sizes and/or by leveraging the virtual store to sell other products. As a part of building the "Customer Relationship", Tesco's well-diversified product line can be heavily promoted to the online customer. Tesco.com providing a wide range of services, it is also effectively an electronic commerce portal in its own way, wanting to become a "One-stop shop" for electronically-arbitrated consumption practices.

### THE FUTURE OF ELECTRONIC GROCERY SHOPPING

In spite of closing down of a number of online grocers and retailers worldwide during the recessionary period in the year 2008, there are still good reasons to hope for continued existence and growth of online food retailing. A primary reason for a retarded growth in online grocery market is that grocery shopping is not a preferred or a privileged activity for many people. But still the whole phenomenon of ordering groceries online is lucrative for different market segments, viz:

1. The "time-poor": well-off family units that are engaged with time-intensive jobs and/or social lives
2. Couples with young children
3. People having difficult access to private or public transport facilities, or even due to choice or apartment living necessity, for whom physically carrying the groceries back home from a store can be strenuous
4. Physically disabled and elderly people for whom the getting to, from and around a store is very tiring;
5. "Technogeeks", who prefer using a computer over physical in-store shopping.
6. Lifestylers: Looking for highly specialized or hard-to-get goods not available in conventional stores.

An important reason why EGS can be a long-term solution is that the logistics are not unfathomable. As the number of customers scale up (even Webvan had shown steady growth just before it collapsed), the delivery logistics become easier and simpler, due to rise in drop density rises and economies of scale coming in action. In-store fulfillment might become a bit more chaotic, as customers contend for scarce shop-floor space and products, but additionally stores in the chain can be supplemented if the backroom space is appropriate. Warehouse fulfillment only becomes feasible with comparatively hefty turnover: Webvan's speculative breakeven point was approximately 2000 deliveries per day per centre, with a total capacity of 8000, which was never fulfilled (Guglielmo, 2000; Mendelson, 2001a; Ring and Tigert, 2002).

Grocery websites can offer a blend of intelligence and simplicity of use to abridge the weekly replacement shop. Tesco and Woolworths have been operating now for nearly a decade, time sufficient to find out what customers anticipate and are ready to pay for. They have constructed noteworthy databases of customer product searches, which confine the products that the customers are looking for that may not be stocked – information that physical stores just don't without an extensive market research. Unlike other e-commerce tasks, food customers have usual prompts for further custom, such as an empty fridge. Carrying out tests & trials with "smart" fridges, which comprise of a scanner and computer that can be used to take into account fridge and cupboard stock usage & handling, might put together the ordering process even simpler, although prevalent acceptance of this technology might be some years away, if at all. The sound conventional trend towards ready meals (Hughes, 1996) could be aided (or reversed) by the more intelligent integration of online planning of meals, including integrated recipes and ordering of ingredients. The grocery shop is a tough & challenging process, calling for outlay in consumers' time and equipment. The first online shop can take over an hour, as consumers make themselves acquainted with the virtual store design and ordering and delivery systems. Time can be considerably decreased throughout the reprocessing and revision of preceding online orders, standing orders of frequent purchases, and by connecting to in-store purchase behavior via loyalty card databases. Repetitive behavior is more probable if the experience is not monotonous, with ordering time supported by deeper penetrations of internet broadband services. The online grocery shop is a vital e-commerce purchase point for customers, both in promptness and in worthiness: a weekly food shopping of ₹100 or more immensely prevails over the infrequent acquisition of a book or even a flight ticket, only outperformed perhaps by virtual banking in transactional value. Creating acquaintances, fluency and trust in e-commerce transactions with online grocers may elevate overall comfort levels for online consumers, and thus lead to further e-commerce transactions in volumes, communication and entertainment, particularly if conveyed with faster embracing of broadband technologies.

### CONCLUSIONS

In scale, and in hype, internet-fueled home delivery grocers pledged to offer something new to present day capitalism: the skill to familiarize customers to the remote ordering of a large range of products from their homes, and delayed delivery to it, on a customary basis. For customers this provides handiness, saving time and sweat, and possibly even money if prices are aggressive and impulse purchases can be shunned. Such online practices for the customers may also lead them to become intimate with technologies due to the gratification that comes from learning and mastering the complex software know-how for the successful home shop. These actions necessitate a range of material processes and places, of which customers may remain principally unaware. For material products like food the infrastructural necessities for the consistent and dependable delivery of the range of products asked for, at the time, place and price preferred, have proved to be considerable and disproportionate for many new start-up for online grocery. This paper is intended to reveal these commonly out of sight materiality of the online grocery shop, and to talk about the techniques and approaches, a number of online grocers have followed to make the virtual noticeable and viable.

Due to the use of automated distribution systems, in-store or stand-alone, as opposed to the use of old conventional mails or courier networks, online grocery is overall an urban experience. There is a discrete spatial ladder of provision, more or less utterly due to the solidity of the customer base (that being a function of population density). Whereas retailers may put in remarkable attempts to support distant and far off rural areas, this is usually at a much larger expenditure

and/or diminished frequency and product prerequisite. On the other hand these serviced pastoral pockets can be rewarding, or to prospective consumers whose nearest supermarket may be quite some distance away.

Online grocery is contingent on a number of networks, new and pre-existing, physical and virtual. Websites of such establishments may be maintained and administered by specialized webhosting facilities, perhaps at different locations. What is important is not where the server is based, but the its download speed to the customer and upload speed to the fulfillment centre. Since fulfillment centers (stores or warehouses) are not usually situated in prime internet backbone areas, it could be a good option to position the web server in a server farm in the CBD. Fulfillment centers need good transportation links, both for incoming replenishment (using large trucks from manufacturers or regional distribution centers) and for local delivery vans. The real 'task' in the wake of online grocery fulfillment may occur largely imperceptibly in distribution centers on the outskirts of a town or in the backrooms of supermarket stores, but the vans that barrage the roads to unite this 'virtual' world to consumers finger tips are a customary souvenir of the materiality of electronic commerce.

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