

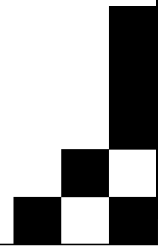
A b s t r a c t

E-commerce researchers have shown that retailers are increasingly following a click and mortar strategy, whereby online and offline channels are becoming more integrated. Despite case study evidence for the benefit of this approach, an analysis of the websites of nearly 1,000 US-based retailers having both an online and offline presence reveals that a high degree of integration across channels is relatively uncommon. On the contrary, the study reported here demonstrates that retailers are more likely to pursue easy-to-accomplish, low intensity, informational integration when developing an online presence, exemplified by such features as a listing of store locations or hours. Few retail websites offer complex integration capabilities, such as the ability to search local store inventories, or to pick up and return online purchases in a local outlet. Regression analyses reveal that the retail sector and firm resources help to explain this discrepancy. With regard to sector, some product types require more physical presence (e.g. in-person inspection or interaction) than others, and a high degree of integration appears to require a level of investment and IT sophistication not always available to small retailers.

Keywords: click and mortar, click and brick, online retailing, e-commerce synergies, online offline integration

Click and Mortar Strategies Viewed from the Web: A Content Analysis of Features Illustrating Integration Between Retailers' Online and Offline Presence

CHARLES STEINFELD, THOMAS ADELAAR AND FANG LIU



INTRODUCTION

As the Internet-using population has grown, so has the potential market size for businesses that develop e-commerce enabled websites. Nielsen Net Ratings, for example, estimates the August 2004 US population of Internet users to be in excess of 134 million people (Anonymous 2004a). Activities related to online commerce are becoming increasingly significant, as more Internet users shop online. For example, a PEW/Internet study estimated that 44% of Internet users bank and pay bills online, and 33% of Internet users go online to purchase everyday items such as books and groceries (Fallows 2004). The study further reported that more than one-third of all Americans, and two-thirds of the US Internet users, go online to obtain product information (Fallows 2004). The increase in e-commerce-related activities is reflected in growing online sales revenue at a rate that far outpaces total retail sales in the US. According to the US Census Bureau's (2004) quarterly report on e-commerce activity, despite being only a small fraction (under

A u t h o r s

Charles Steinfield (steinfie@msu.edu) is Professor of Telecommunication, Information Studies and Media at Michigan State University. His research focuses on the social and organizational aspects surrounding the implementation and use of new communication and information technologies.

Thomas Adelaar (t.adelaar@aim.unimaas.nl) is Assistant Professor at the University of Maastricht, the Netherlands, at the Department of Accounting and Information Management. His research focuses on the use and effects of e-commerce for market structure, firm strategy and the way firms do business.

Fang Liu (liufang@msu.edu) is a doctoral candidate in the Department of Telecommunication, Information Studies, and Media at Michigan State University. Her research focuses on online consumer behaviour, e-commerce, and marketing strategy.

2%) of all retail sales, online sales increased 26.4% from 2002 to 2003, reaching over \$56 billion in annual sales (US Census Bureau 2004).¹ This trend is continuing in 2004, with a growth of 25.5% per cent for the first two quarters compared to same period in 2003. The growth of the total retail sales for the same period was much lower – only 5.3% growth from 2002 to 2003, and 8.2% for the first two quarters of 2004 compared to 2003.

The more rapid growth of online versus offline sales suggests that established retailers can benefit from the development of an e-commerce strategy. Indeed, earlier studies have indicated that in the post dotcom crash era, established retailers have become increasingly more prominent online compared to Internet-only firms (Laudon and Traver 2003). E-commerce researchers consider the integration of offline and online channels to be a distinct e-commerce business model, which is usually referred to as a click and mortar or click and brick model (Steinfield *et al.* 2002b).

E-commerce researchers have begun to analyse the benefits for retailers of using a combination of online and physical sales channels (Otto and Chung 2000; Rosen and Howard 2000; Steinfield *et al.* 2001, 2002a, 2002b). For example, Otto and Chung (2000) proposed a framework comparing the general advantages and disadvantages of both e-commerce and traditional physical retailing, and suggested possible approaches to applying e-commerce retailing techniques to traditional retailing. Steinfield *et al.* (2002a, 2002b) addressed the click and mortar e-commerce model using a framework that emphasizes the potential synergies arising from the integration of e-commerce with offline channels (such as retail outlets), based upon a series of case studies of retailers in the US and the Netherlands.

Despite these efforts, many gaps remain in the knowledge about the e-commerce approaches of established retailers. In particular, we identify four main gaps:

1. Little is known about the *relative prevalence* of click and mortar retail strategies among the general population of retailers. Many studies of click and mortar e-commerce rely on analyses of specific cases where firms have demonstrated a channel integration strategy (Steinfield *et al.* 2002a, 2002b). Such cases can only reveal the universe of possibilities regarding ways of using the Web to complement physical stores and other established sales channels, not how often any of these strategies can be found in practice among the general population of retailers.
2. Most references to click and mortar business models often treat this form of retailing as an all-or-nothing attribute, with no metrics to reflect the *relative intensity* of channel integration (e.g., see Rappa 2005). Just because a firm develops an online presence does not mean that its website is tightly integrated with its physical channels (e.g., retail

outlets). Indeed, many retailers go online with websites that are quite independent of their existing store infrastructure, instead choosing what might be called a parallel e-commerce strategy (Steinfield *et al.* 2001).

3. It is relatively common for e-commerce researchers to assume that product attributes can influence the viability of online channels, for example, by affecting search and evaluation efforts required for a customer to make a purchase decision, delivery costs and delivery time (Choi *et al.* 1997; Gupta *et al.* 2004). Product attributes can result, therefore, in different patterns of channel integration across different sectors within the retail industry. Automotive dealers use the Internet to complement their businesses in different ways compared to music or book retailers, for example (Klein 1998). However, while cross-sector case-based research can suggest possible differences across types of products sold by retailers, a more quantitative approach could more clearly reveal sector differences in the prevalence of a channel integration strategy (e.g., in which industries a greater degree of online and offline channel integration can be found).
4. Resources of a firm, such as its size and the extent of its physical infrastructure, often influence the nature and effectiveness of an Internet strategy. For example, studies have found that the existing information technology (IT) capabilities of a firm can enable a more effective use of the Internet (Zhu and Kraemer 2002). However, case studies by themselves are not well suited to inform us whether such factors influence the extent of channel integration across firms.

In order to address these gaps in the e-commerce literature, this paper reports on a content analysis of the websites of US-based retailers. We examined a total of 979 websites of click and mortar retailers in nine different retail sectors in order to explore the way in which they followed various forms of online and offline integration strategies. We specifically addressed four primary questions:

1. How are retailers using the Web to complement offline sales outlets?
2. Do retailers differ in the extent to which they integrate on- and offline channels?
3. How does the degree of channel integration differ across retail sectors and product type?
4. How are click and mortar strategies influenced by resource-related aspects of a firm?

The paper is organized as follows: First, we review prior research related to click and mortar e-commerce in order to identify the features found on websites that reflect a click and mortar strategy. Second, we provide an

overview of the methods used to perform a content analysis of retailer's websites, focusing on the analysis of the features that reflect a channel integration strategy. The methods section includes the development of content categories, the sampling strategy, the coding methods, and an assessment of inter-coder reliability. Third, the results of the content analysis are described, along with the results of several additional analyses examining how a firm's use of click and mortar features present on the Web relates to other firm characteristics. A fourth section provides a discussion of our findings and the contribution of the study to theory and practice. The fifth and final section discusses the limitations of the study and our conclusions.

LITERATURE REVIEW

The literature review consists of five parts. First, we discuss the benefits of a click and mortar strategy as well as the barriers to implementing such a strategy. Then we discuss the lessons learned from a series of case studies. A summary is provided of the representative features and services of a click and mortar website. Finally, we discuss the factors influencing the use of click and mortar features.

Theoretical foundations of the competitive advantage of click and mortar business models

In the early years of Web-based commerce, much emphasis was placed on sources of competitive advantage that Internet firms had over established ones, primarily using a transaction cost logic (Bakos 1997; Choi *et al.* 1997). Transaction costs include the costs buyers and sellers face in such areas as information gathering and search, negotiation and settlement, and monitoring to ensure that trading partners adhere to the terms of any agreements made (Williamson 1975, 1985). The Internet helps reduce the two categories of transaction costs, namely costs to coordinate and safeguard a transaction. A reduction of transaction costs potentially enables buyers to find sellers in distant geographic markets who have lower prices, provide better service, offer higher quality, or have products that better match needs (Bakos 1997; Cairncross 1997; Choi *et al.* 1997; Malone *et al.* 1987; Wigand 1997; Wigand and Benjamin 1995; Wildman and Guerin-Calvert 1991).

From this perspective, rather than explaining the rising importance of the click and mortar approach to e-commerce, transaction cost theory is more often used to explain the emergence and expected dominance of Internet business models. It emphasizes the reasons why Internet firms may be able to compete successfully with local, physically present businesses, rather than emphasizing the reasons why physically present

businesses may be more able exploit the Internet than those without any physical market presence. Additionally, numerous other analyses of Internet businesses have a similar bias towards the economic advantages that Internet-only firms enjoy over established firms with a physical presence in the marketplace. Web-based businesses are perceived to hold many operational, cost, scale and scope advantages over firms confined to physical channels, including: access to wider markets, lower inventory and building costs, flexibility in sourcing inputs, improved transaction automation and data mining capabilities, ability to bypass intermediaries, lower menu costs enabling more rapid response to market changes, ease of bundling complementary products, ease of offering 24/7 access, and no limitation on depth of information provided to potential customers (Afuah and Tucci 2001; Anonymous 2000; Bailey 1998; Choi *et al.* 1997; Wigand 1997; Wigand and Benjamin 1995).

These analyses, however, mainly contrast established firms with Internet firms and largely ignore the benefits arising from the potential synergies when firms have a combination of physical and e-commerce channels. A growing body of e-commerce research, however, now focuses on these potential synergies, and criticizes the early over-emphasis on Internet-only business models (Friedman and Furey 1999; Otto and Chung 2000; Rosen and Howard 2000; Steinfield *et al.* 2001, 2002a, 2002b; Steinfield and Klein 1999; Ward 2001). This alternative perspective is rooted in the notion that click and mortar firms benefit from the ability to exploit complementary assets, providing an advantage over newly emerging Web-based competitors. For example, established firms have existing supplier and distributor relationships, market power, experience in the market, a customer base, brand recognition and other complementary assets that can enable them to take greater advantage of an innovation like e-commerce (Afuah and Tucci 2001; Teece 1986). Advantages arise not only from the ability that a multichannel approach offers for reaching new customers and offering new services, but also because each channel can have spill-over effects that result in increased purchases and reduced costs in the other channel (Ward 2001).

In a similar fashion, classic theories of competitive strategy emphasize the importance of exploiting inter-relationships among various tangible and intangible assets as important sources of synergies that can drive competitive advantage (Porter 1985). These works, along with marketing theories focusing on channel coordination further point to management strategies that can help elicit the benefits from potential sources of synergy, as well as help to avoid damaging channel conflicts (Friedman and Furey 1999; Stern and Ansary 1992). Information systems research has a long history of emphasizing how electronic networks can be used to realize competitive advantages, particularly to achieve cost, differentiation and geographic expansion benefits

(Bakos and Treacy 1986; Johnston and Vitale 1988; Porter and Millar 1985). It is a small step to show how these classic competitive advantages can be derived from a successful exploitation of synergies between physical and virtual channels. Click and mortar firms also have an opportunity to avoid one of the most difficult problems facing Internet-only businesses – lack of trust (Iyer *et al.* 2004). Here, again, classic transaction cost theories, as well as research in the field of economic sociology, can be brought to bear to shed light on why integration among channels can be a more successful strategy (DiMaggio and Louch 1998; Granovetter 1985; Steinfield and Klein 1999; Steinfield *et al.* 1999; Steinfield and Whitten 1999).

The potential benefits from integration of physical presence and e-commerce have been elaborated by Steinfield *et al.* (1999), who suggested four sources of advantage that retailers with a local presence have over pure Internet firms. These include:

1. improved trust – consumers who recognize a Web store as an extension of an existing business may perceive it to be more legitimate, and have more trust in the store;
2. reduced consumer risk – e.g., being able to return goods to a physical store can lessen risks associated with online purchases;
3. broader coverage of diverse shopping preferences – e.g., those needing an item immediately can pick it up at a local store, while those with limited free time can shop online at their convenience; and
4. natural complementarities between the two channels – e.g., items can be purchased online, while the physical store can be used as a site for servicing and advice.

Potential barriers to implementing click and mortar business models

With the increase in the population of Internet users and online retail sales, more and more firms are including the Internet (e.g., a website) in their channel strategies. However, many retailers have minimized their online efforts, continuing to sell via traditional offline channels. A variety of reasons contribute to traditional retailers' delay in adopting a click and mortar strategy. Here we briefly outline four barriers noted in the literature:

1. The complexity in pricing and differences in channel and consumer characteristics make it difficult for the traditional retailers to reconcile their traditional operations with their online efforts (Viswanathan 2000).
2. The threat of channel conflict can inhibit e-commerce channel development. By channel conflict, we mean the difficulties that can arise when the same good or service is sold

simultaneously in online and offline channels. Channel conflict is especially a challenge for click and mortar firms because of a) price competition: consumers can compare prices across online and offline channels and will ultimately extract the surplus created by lower costs and b) non-excludability: there is no reliable way for retailers to segment the market. As a result, it is fairly easy for consumers to switch channels in order to extract the greatest benefit (Chwelos and Brydon 2000). Some customers use retailers' websites for searching for information about products and performing product comparisons, then ultimately go to physical stores to make the actual purchase (Prasarnphanich and Gillenson 2003). Forrester Research reported that 65% of online consumers in 2004 are cross-channel shoppers (consumers who research online and buy offline), making an estimated 305 million cross-channel transactions, with an average transaction size of \$400 (Anonymous 2004b).

3. Firms may suffer from a lack of resources, as the integration of online and offline channels requires investments in IT resources. Also, in order to realize the potential benefits of IT resources, investments in intangible assets, such as new organizational processes and structures, worker knowledge, and redesigned monitoring, reporting, and incentive systems, may be needed, all of which may be very costly to implement (Brynjolfsson *et al.* 2002). From the perspective of the management of core internal business processes, Barnes *et al.* (2004) suggest that increased integration of e-commerce applications within existing business processes is inhibited by technological, sociological and economic barriers.
4. The use of established brands for the online operations of a firm may have a detrimental impact on a firm's brand or may even marginalize a firm's brand equity due to poor integration of operations (Saeed *et al.* 2003).

Lessons learned from previous click and mortar case studies

An important benefit of click and mortar integration is to provide flexibility to customers in the purchase process; this depends heavily on integration of information systems supporting virtual and physical channels (Saeed *et al.* 2003). As more retailers begin to integrate their physical and Internet channels, it is important to study the strategies they follow (Prasarnphanich and Gillenson 2003). In the following paragraphs, we identify a number of click and mortar features and services found in the literature.

Steinfield *et al.* (2002a, 2002b) conducted a series of nearly 30 case studies in the Netherlands and the US to

explore the practices of click and mortar firms. The cases spanned many different types of industries, and included companies selling to other businesses, as well as those selling to end-consumers. The types of products offered were wide-ranging, including both physical and information products, information services, large durables and small products, and perishable and non-perishable products. Interviews with company marketing and e-commerce managers, along with reviews of public data about the companies and the publicly accessible portions of company websites, yielded many insights about the inner workings of click and mortar firms.

Steinfeld *et al.* (2002a 2002b) suggest that the click and mortar cases took advantage of a number potential sources of synergy not necessarily available to dot-com or traditional offline competitors, including capitalizing on the fact that traditional and e-commerce channels can share common infrastructures, operations, marketing, and customers and other complementary assets. Several case study firms, for example, used their existing logistics infrastructure for warehousing and distribution of products for both e-commerce and traditional channels. This is especially the case when firms offered a pick-up in the store option, so that goods ordered online could be delivered to the desired store if not already in the store's inventory. An example of IT infrastructure sharing is when existing store inventory systems are integrated with e-commerce. The US electronics retailer case, for example, highlighted the fact that online customers could check local store inventory, and request that an item be held for in-store pickup. A common order processing system shared between e-commerce and physical channels is a good example of a common operation as a source of synergy. In many of the firms, e-commerce and physical channels shared common marketing and sales assets. Some, like the US gift retailer, had a common product catalogue. Others, such as the book retailers, took advantage of the fact that their offline sales force had a strong understanding of the products, allowing them to more effectively meet online customer needs through book recommendations. Finally, with an integrated channel approach, advertisements and promotions in each channel can draw attention to the other, enhancing spill-over effects. The automobile importers and manufacturers, for example, due to regulations prohibiting direct sales to consumers, relied extensively on online promotion to drive traffic to their affiliated dealerships.

Saeed *et al.* (2003) suggest that click and mortar integration at the operational level could be presented in terms of value added services such as (1) informational integration, which allows customers to locate the nearest store, check inventory, order and make payment, set up and manage an online account; and (2) logistical integration, which means that the underlying information infrastructure caters to the flexibility demands of the distribution system. Logistical

integration allows customers to order online and pick up their order from the nearest store and to return products purchased from the Web at the local outlet.

Summarizing representative click and mortar features and services

Based on the above review and case studies, a number of features and services are suggested that a retailer can use to link their website to their physical outlets. These website features collectively provide information about how and when to access the physical retail outlet, as well as support transactions that take place in or otherwise involve some aspect of the physical retail outlet. They include such features as the following: a map and/or driving directions to retail outlets, information about the history or background of the company, the hours of operation of retail outlets, information on retail outlet events or special sales, coupons or gift certificates redeemable in retail outlets, the ability to search the inventory of a retail outlet, the ability to make an appointment or reservation for a service in the retail outlet, allowing customers to return items purchased online to retail outlets, providing links to other businesses in the same community where retail outlets are located, and allowing online orders to be picked up at retail outlet.

Factors influencing use of click and mortar features

Below we discuss the influence of product type, firm structure and firm resources on the use of click and mortar features by retailers.

Product type

Firms' click and mortar integration can be predicted by a variety of factors. The first set of factors stems from the specific types of products and services that a retailer sells. The characteristics of products and services can influence the way an online channel might be used, due to variations in such factors as the physical properties of the product, the value of the product, and the frequency with which the product is purchased. The Web enables consumers to become aware of and transact with Internet retailers who may be located anywhere. However, there is a spatial dimension for products that influences their location of production and consumption – some products and services must be both produced and consumed locally, while others such as larger appliances may be more costly to transport. However, many other types of products and services can be produced anywhere and either electronically or physically delivered to consumers (Steinfeld *et al.* 1999). Physical interaction with certain types of products may be an important aspect in a purchase decision. Internet

channels may not be appropriate if customers perceive the product as requiring touch or feel to judge quality, or if it is otherwise difficult to acquire due to logistical considerations (Klein 1998; Saeed *et al.* 2003). In addition, certain firms derive value from providing an experience within a physical retail outlet (Pine and Gilmore 1999). As a result, some firms' websites only serve as a storefront presence for the firms, while others support online orders and transactions.

Firm structure

Retail chains and sole proprietorships may adopt different click and mortar strategies, since they may manage a different number of firm locations. Adding a virtual channel can help extend the reach of a firm beyond its traditional physical outlets, addressing new geographic markets. However, a retailer with a single location (often a sole proprietorship) is limited in exploiting its physical presence (e.g., to permit physical inspection of products) for customers living outside of its traditional local market. In contrast, a firm with multiple locations (e.g., a retail chain) can leverage its presence in a number of local markets. For example, retail chain firms are more likely to have established distribution centres, and are more likely to have experience in coordinating multiple-location operations. These centres and gained experience can be used to handle Internet orders efficiently and effectively by capitalizing on scale economies.

Firm resources

Another set of factors is related to a firm's resources that can be used to pursue a click and mortar integration. Earlier research has emphasized the importance of a firm's resources in predicting the ability to capitalize on IT innovations (Tornatsky and Klein 1982). More recently, researchers have argued that existing IT resources such as the number of PCs in the firm, the extent to which these PCs are networked, and other indicators of IT stocks are important enablers for e-commerce (Zhu and Kraemer 2002). Other resources include a firm's brand name, quality of existing supplier relationships, and possession of a range of other complementary assets, as well as capital and human resources that can be utilized to facilitate its e-commerce (Steinfield *et al.* 2002a). In addition, companies that already engage in catalogue sales have an established infrastructure and business model that can be applied and enhanced with relative ease to handle Internet orders. Firms with such resources, as indicated by such proxies as firm age (suggesting such resources as existing supplier relationships and brand name), sales volumes and number of employees, are more likely to invest in e-commerce and pursue a click and mortar integration

strategy, due to a higher return on investment in comparison to firms without these resources.

RESEARCH METHODS

The content analysis method has been a widely recognized research tool used in a variety of research disciplines. Berelson (1952: 18) defined content analysis as 'a research technique for the objective, systematic and quantitative description of the manifest content of communication'. McMillan (2000) identified four primary advantages of content analysis: (1) it is unobtrusive; (2) it accepts unstructured material; (3) it is context sensitive and thereby able to process symbolic forms; and (4) it can cope with large volumes of data. These attributes make content analysis a particularly appropriate tool for analysing Web content.

In recent years, the content analysis research method has been applied to a variety of e-commerce research. Dou *et al.* (2002) used a content analysis procedure to explore how firms utilize different elements of their corporate websites to reach and sell to potential customers, and to achieve their communication and transaction objectives. Zhu and Kraemer (2002) performed a content analysis of 260 manufacturers' websites to identify firms' e-commerce capabilities.

One of the purposes of our study is to identify retailers' channel integration approaches, and in particular, those that are reflected by the click and mortar features on their websites. Therefore, content analysis is an appropriate research method for our study. In this study, we carefully followed the content analysis procedures recommended by McMillan (2000), including: (1) selecting the sample; (2) defining the unit of analysis categories; (3) training judges; and (4) gathering data.

Sample selection

The sample was comprised of companies drawn from nine different retail sectors according to the North American Industrial Classification System (NAICS) (see Table 1). The nine sectors were chosen based on prior research comparing the relative use of e-commerce across a wide range of product categories, with sectors that historically have experienced greater e-commerce sales selected for inclusion in our study (Laudon and Traver 2003).

The sample was drawn from a national database provided by Dun and Bradstreet, Inc. in March 2002. In each of the nine selected NAICS retail sectors, at least the top 350 firms by revenue size were selected, giving us a list of 3,100 firms in total.² We searched for the URLs of all the firms in our sample using several different public search engines such as google.com. Ten students from a large Midwestern university were

Table 1. NAICS codes of the nine retail industry groups selected

NAICS Code	Industry
441	Motor Vehicle and Parts Dealers
442	Furniture and Home Furnishings Stores
443	Electronics and Appliance Stores
444	Building Material and Garden Equipment and Supplies Dealers
446	Health and Personal Care Stores
448	Clothing and Clothing Accessories Stores
451	Sporting Goods, Hobby, Book, and Music Stores
452	General Merchandise Stores
453	Miscellaneous Store Retailers

employed to look up the URLs of the firms. We found that 1,689 firms had some sort of Internet presence. We cleaned our database by setting websites apart from listings on business referral websites, city guides, and others. Also, double accounting was deleted, since a number of franchised firms that did not manage their own websites were included in the original list. Further, websites which were not operational, under construction, or not accessible were also removed from the list. After these filters, 978 firms were finally selected. Table 2 provides a summary of the companies that were included in the content analysis.

Units of judgements

In content analysis studies, coding units and context units are the two most widely used measurement tools (Budd *et al.* 1967: 33–6). Coding units are the smallest segment of content counted and scored, whereas the context unit is the body of material surrounding the coding unit. In this study, the context unit for coding is defined as all pages found at each given website.

In spring 2002, the websites of the 978 US-based retail firms were content analysed. The framework for analysing the websites is based on a coding schema

including 16 categories based on the features found at firms' websites that indicated the extent to which firms were pursuing an online-offline integration strategy (see Table 3). The categories are derived from Steinfield *et al.*'s (2002a, 2002b) case studies, as well as other literature cited above.

Judge training

Through a series of training sessions, student coders were trained to code the selected firms' websites according to the schema developed for this study. They conducted a content analysis on the websites on our list, and filled out a standard Excel data form. Each category was coded using a binary variable, representing whether or not a website had the particular feature. If a website had the feature, it was coded '1'; if not, it was coded '0'; and undefined variables were coded as missing data.

Inter-judge reliability

The Holsti value, which indicates the proportion of total pairwise agreements between judges, is the simplest and most widely used measure to test inter-judge reliability. In the inter-judge reliability test, 9 judges coded 9 firms that were randomly chosen from the 978 coded firms. The average Holsti value of the 9 judges was .87. Further, we used a new judgement-based, qualitative research reliability measure designed specifically for testing reliability of multiple coders that was developed by Rust and Cooil (1994), called the proportional reduction in loss (PRL). The PRL measure is a standardized measure of the loss expected to result from the errors caused by using the scale score for decision-making purposes (Rust and Cooil 1994).

One of the advantages of the PRL measure is that it can generalize across both quantitative and qualitative scenarios. As a result, it is useful for analysing the quality of the coded judgements that are collected as

Table 2. Summary of firms included in the website content analysis

Retail sector	NAICS code	Number of firms	Mean annual revenue (in millions)	Mean number of employees
Motor Vehicle and Parts Dealers	441	200	362.7	594
Furniture and Home Furnishings Stores	442	138	64.2	495
Electronics and Appliance Stores	443	144	359.2	1,715
Building Material, Garden Equipment, and Supplies Dealers	444	121	737.0	4,186
Health and Personal Care Stores	446	58	1,114.5	5,937
Clothing and Clothing Accessories Stores	448	97	833.2	8,465
Sporting Goods, Hobby, Book and Music Stores	451	140	120.9	1,143
General Merchandise Stores	452	51	7,108.0	51,157
Miscellaneous Store Retailers	453	29	674.1	4,196

Table 3. Content analysis categories and coding scheme

<i>Features</i>	<i>Coding scheme</i>
1. Phone number of retail outlets	Whether the website offers the phone number of a specific physical store in a particular location or a specific person at a particular location.
2. Mail address of retail outlets	Whether the website offers the physical mail address of a specific physical store in a particular location.
3. Map to retail outlets or driving directions	Whether the website provides any sort of map showing how to travel to any physical store.
4. Hours of operation of retail outlets	Whether the website indicates the hours during which any physical store is open for business.
5. Company background or history	Whether there is any historical or other background information that is specific to the business operating in a particular physical location.
6. Links to other businesses in the community where retail outlets are located	Whether there are links to other businesses or organizations in the specific city or town of the physical store.
7. Information on retail outlet events or specials	Whether it is possible to find out what type of sales or special events are happening in specific physical stores.
8. Coupons or gift certificates redeemable in retail outlets	Whether it is possible to obtain a coupon or buy a gift certificate that can be used in a physical store.
9. Ability to make an appointment or reservation for a service in the retail outlet	Whether there is any way to make an appointment with someone, or reserve some sort of service at a physical store.
10. Ability to complete a full transaction online	Whether it is possible to make a complete purchase, including ordering and payment, entirely online.
11. Ability to search the inventory of a retail outlet	Whether it is possible to look to see if a particular product is available (in stock) at a particular store location. Otherwise, code 0.
12. Allow online orders to be picked up at retail outlet	Whether it is possible to order a product online, but pick it up at a specific physical store
13. Allow checking on the status of an online order	Whether it is possible to check on the status of a particular order.
14. Allow customers to set up and manage accounts	Whether it is possible to create and manage a personal account on the website.
15. Allow customers to place items in a gift registry	Whether it is possible to create a gift registry or a wishlist of products.
16. Allow customers to return items purchased online to retail outlets	Whether it is possible to return products purchased online to a physical store.

'quantitative' data, but as a matter of fact are qualitative in nature, such as the case of the content analysis data collected in our study. The proportional agreement for this test was .87. Based on 'The PRL Reliability for Two Categories Given Number of Judges and Proportion of Interjudge Agreement Measure Table' (Rust and Cooil 1994: 7), the PRL reliability measure for this reliability test is 1.00. Because the 1.00 level for PRL is directly comparable to a Cronbach's alpha of 1.00 in terms of expected loss, it indicates a very high level of agreement among all the judges.

RESULTS

Below we discuss the result of the content and regression analysis.

Content analysis

Trained coders content analysed all of the selected company websites for the presence or absence of 16 different features that reflected the degree to which the online site was integrated with physical retail outlets. In Table 4, we group these features into three categories: 1) simple information – i.e. basic references to stores found in nearly all firms' websites; 2) complex online/offline integration (i.e. explicitly involves a retail outlet in the transaction in some way); and 3) other features that reflect some degree of online expertise, but do not necessarily imply a click and mortar orientation. As shown in Table 4, nearly all firms included the telephone number and address of retail outlets, and more than two thirds also provided a map or directions for finding retail outlets. Other common click and mortar features

Table 4. Relative frequency of selected website features in click and mortar firms

<i>Website characteristics</i>	<i>Percentage of sites with feature</i>
<i>Simple information</i>	
1. Phone number of retail outlets	96
2. Mail address of retail outlets	96
3. Map to retail outlets or driving directions	71
4. Company background or history	58
5. Hours of operation of retail outlets	52
6. Information on retail outlet events or specials	45
<i>Complex online/offline integration</i>	
7. Coupons or gift certificates redeemable in retail outlets	25
8. Ability to search the inventory of a retail outlet	19
9. Ability to make an appointment or reservation for a service in the retail outlet	15
10. Allow customers to return items purchased online to retail outlets	8
11. Links to other businesses in the community where retail outlets are located	7
12. Allow online orders to be picked up at retail outlet	6
<i>Other features reflecting online expertise, but not necessarily a click and mortar orientation</i>	
13. Ability to complete a full transaction online	33
14. Allow customers to set up and manage accounts	27
15. Allow checking on the status of an online order	21
16. Allow customers to place items in a gift registry	7

included the provision of historical background on the company, the hours of operation of physical retail outlets, and information about in-store events or special sales. These all reflect informational strategies rather than transaction-oriented click and mortar services or services illustrating interoperability between stores and websites. Somewhat less common were such features as the provision of coupons or gift certificates redeemable in stores, the ability to search in-store inventory, the ability to make appointments, and allowing customers who bought goods online to return them to physical stores. In only about a third of the sampled firms could customers complete a full transaction online.

In order to create a single score that represented each firms' degree of click and mortar use, we generated an index by taking the sum of the total number of click and mortar features found on each firms' website. The click and mortar features included both the informational features (items 1 to 6 in Table 4) and the more complex online/offline integration features (items 7 to 12 in Table 4). In order to increase the discriminatory power of this index, however, we dropped the first two items – having a phone number and a mail address of retail outlets – since just about every firm's site included these features. Each item present on the site counted as one, so that the maximum possible score was 10, and the minimum was 0. The resulting click and mortar intensity index ranged from 0 to 8, with a mean of 3.06 and standard deviation of 1.67. The mean scores on this

index by industry sector are provided in Table 5. An analysis of variance reveals that motor vehicle and parts dealers ($M=4.34$, $S.D.=1.61$) and general merchandise stores ($M=4.00$, $S.D.=1.23$) exhibit a significantly higher degree of channel integration approach than firms in other retail sectors (Overall ANOVA, $F=33.81$, $p<.0001$). A post hoc comparison showed that these two sectors scored significantly higher than all others at the $p<.05$ level.

Factors influencing the intensity of click and mortar integration

In our earlier discussion, we proposed a number of factors that might influence a firm's click and mortar intensity, including industry sector, whether a firm is a single or multiple location retailer, firm resources, firm age, and evidence of an existing IT infrastructure. The Dun and Bradstreet database included measures for each of these factors that we used in a regression analysis. Firm resources were measured by a size index created out of a firm's annual sales and total number of employees. An indicator of existing IT infrastructure was measured by a count of the total number of PCs in the firm. We used these factors as independent variables, predicting a firms' score on the click and mortar intensity index. As shown in Table 6, collectively these five factors have a positive influence on the click and mortar intensity of the firms' websites ($R^2=.23$,

Table 5. Variation in click and mortar oriented web features across different retail sectors

<i>Retail sector</i>	<i>NAICS code</i>	<i>Number of firms</i>	<i>Click and mortar index score Mean (Std. Dev.)</i>
Motor Vehicle and Parts Dealers	441	200	4.34 (1.61)
General Merchandise Stores	452	51	4.00 (1.23)
Sporting Goods, Hobby, Book and Music Stores	451	140	3.10 (1.58)
Clothing and Clothing Accessories Stores	448	97	2.85 (1.49)
Furniture and Home Furnishings Stores	442	138	2.79 (1.33)
Building Material, Garden Equipment, and Supplies Dealers	444	121	2.69 (1.39)
Miscellaneous Store Retailers	453	29	2.41 (1.30)
Health and Personal Care Stores	446	58	2.34 (1.50)
Electronics and Appliance Stores	443	144	2.07 (1.45)

$p < .0001$, $n = 934$, $F(12, 921) = 22.80$). Industry sector and firm size both have a significant positive influence on click and mortar intensity at the .05 level or better. A dummy variable reflecting a multilocation (e.g., retail chain) retail outlet structure did not achieve significance, but had a marginal association at the $p < .10$ level. If we had data on the actual number of locations, this variable may have fared better. Within industry sector, and as suggested by the earlier ANOVA results, motor vehicle and parts dealers ($p < .0001$), and general merchandise stores ($p < .0001$) tend to be positively associated with click and mortar intensity whereas electronics and appliance stores ($p < .0001$), building material, garden equipment, and supplies dealers ($p < .05$), health and personal care stores ($p < .001$), and miscellaneous store retailers ($p < .05$) tend to be negatively associated with click and mortar intensity. Age of a firm and the number

of PCs did not relate to the use of click and mortar e-commerce features.

DISCUSSION

The content analysis of websites illustrates that, despite prior research suggesting the value of channel integration, highly integrated click and mortar approaches are not altogether common, and mainly focus on easier to implement informational strategies. Most firms are simply featuring information, such as a phone number or mail address of retail outlets, a map to retail outlets or driving directions, company background or history, hours of operation, and information on retail outlet events or special sales. Relatively few firms have adopted a complex click and mortar approach based on the proportion of sites containing these features.

Table 6. Regression results on click and mortar intensity

<i>Dependent Variable: Click and Mortar Intensity</i>			
<i>Overall model:</i>			
R ²		0.23	
Significance		<.0001	
<hr/>			
<i>Industry Sector:</i>	<i>NAICS</i>	<i>Standardized beta coefficient</i>	<i>Probability</i>
Motor Vehicle and Parts Dealers	441	1.47	<.0001
Furniture and Home Furnishings Stores	442	-0.14	0.2788
Electronics and Appliance Stores	443	-0.80	<.0001
Building Material, Garden Equipment, and Supplies Dealers	444	-0.26	0.0477
Health and Personal Care Stores	446	-0.68	0.0003
Clothing and Clothing Accessories Stores	448	-0.10	0.5139
Sporting Goods, Hobby, Book and Music Stores	451	0.15	0.2518
General Merchandise Stores	452	0.96	<.0001
Miscellaneous Store Retailers	453	-0.60	0.0179
Sales Volume and Number of Employees		1.62	0.0209
Firm Age		0.58	0.4084
Multiple/Single Location		0.11	0.0712
PC EST		0.01	0.9851

We also observed that only one-third of the firms in our sample had a website where consumers could complete a full transaction online. This is an indication that firms rely greatly on their physical retail outlets to complete transactions. However, firms show only minimal effort towards a click and mortar integration that could facilitate the completion of transactions offline. For example, less than one in five allowed consumers to check a store's inventory online prior to visiting the store, and only 6% allowed online shoppers to pick up and pay for goods at the physical store. This mismatch of strategies potentially reduces the benefits derived from Internet-related investments.

Our analyses shed light on possible explanations for the relative lack of retailers' online and physical integration. Among the explanations we were able to explore are whether retail sector, firm resources, having multiple locations, firm age, and IT infrastructure related to the use of a click and mortar strategy. Our results suggest that researchers need to explore more fully the costs and benefits of integration in order to understand retailer strategies.

The degree of channel integration differs significantly across the retailing industry sectors. The finding that auto dealers and department stores are more likely to integrate online and physical retail channels is easily explained. Cars are a type of product that demands a physical outlet to supplement online selling, both for product testing and the critical after-sales service relationship (Molesworth and Suortti 2002). The automotive retail sector deals with a high-value, high-involvement product category. Molesworth and Suortti (2002) suggest consumers only value and use the auto dealer websites at the very early, information seeking stages to improve the balance of power between themselves and car salespeople. During later stages in the buying process people may resist the use of a new innovation like the Internet to finalize their purchase, resulting from the consumer's need for personal experience with the product prior to purchase (i.e., test driving), the uncertainty regarding after-sales support, the reluctance to give up the social aspects of car buying, and a perceived inability to negotiate through a website (Molesworth and Suortti 2002). Therefore, it makes sense for auto dealers to adopt a hybrid strategy integrating online and offline channels in order to meet consumers' needs at different stages of the purchasing process.

Another reason that auto dealers have pursued a click and mortar strategy stems from the competitive pressures arising from popular automotive websites that assist consumers in buying and selling cars. Examples include autobytel.com and cars.com. Dealers often list their cars on these websites themselves. The listing usually includes a hyperlink back to their company homepages. A click and mortar approach is a way to turn

this additional web traffic into customer visits to the dealer's physical outlets.

Department stores have invested heavily in their physical infrastructure, and would not want to undermine these investments with a pure online strategy. Rather, they depend on attracting customers into the store where sales people can engage in cross-selling and up-selling. They are also larger (in terms of size, and number of locations for example), and more likely to have an existing IT infrastructure and backend systems upon which an e-commerce capability can be built. In addition, many department stores are heavily engaged in traditional catalogue sales. E-commerce can be regarded as a natural extension of catalogue sales thus requiring lower costs to integrate online and offline channels. Further, department stores face increased competition from Internet firms such as Amazon.com, which rival these stores in terms of the depth and breadth of available products in the physical retail outlets. A click and mortar integration provides a way for department stores to match the offers of Internet-only competitors and to distinguish themselves from Internet stores by offering face-to-face services available in their stores.

Interestingly, the electronic and appliances stores have the lowest degree of click and mortar integration, especially since this industry segment is reported to be among the highest in terms of annual e-commerce retail sales levels (Laudon and Traver 2003). The low integration indicates that these firms have adopted a more parallel strategy towards e-commerce. A parallel strategy can be explained by taking into consideration the great competition from Internet firms, such as Dell.com. Intensive competition may create the need to compete head to head with the Internet firms. Local stores may prefer to replicate the marketing strategies of Internet firms, such as creating a national appeal online. Therefore, there are fewer incentives for electronic and appliances stores to promote the local store character on their websites, since that might hurt their business and competitive edge.

Finally, firm size significantly predicted click and mortar intensity. This measure may broadly subsume the many kinds of resource advantages available to larger firms, including the likelihood that larger firms have more IT skills, inventory depth, marketing and promotion capability, and so forth. The firm size relationship thus suggests that achieving real synergy between online and offline operations requires significant investments that may not be available to small and medium-sized enterprises. Firm size is also likely to be related to the IT budget in absolute numbers, which can be partly used for click and mortar investments. More importantly, larger firms are more likely to have an established IT/e-commerce strategy. An existing IT/e-commerce strategy would contribute to the perceived relevance and

importance of a click and mortar strategy among firm managers.

CONCLUSIONS

This content analysis study lends support to the theoretical basis behind the click and mortar conceptual framework emerging in the e-commerce literature – click and mortar firms use online website features that capitalize on the complementary assets from the traditional arm of the company. Our results demonstrate that highly integrated strategies are not common in practice, due to both product characteristics and availability of resources. However, a content analysis alone does not allow an empirical test of another very important relationship hypothesized in the early e-commerce literature – that online and offline channel integration leads to superior firm performance. We suggest further studies look into the benefits of online and physical channel integration. Further, there are indications that competition from Internet-only firms influence the pattern of click and mortar strategies. Some industries, such as the electronic and appliances stores, appear to favour a parallel strategy towards e-commerce. Others, such as automotive retailers and department stores appear to prefer tightly integrated click and mortar strategies. Future research should try to assess how competitive pressures interact with such factors as product characteristics and firm resources in explaining the pattern of click and mortar e-commerce strategies.

ACKNOWLEDGEMENT

This research was supported by a grant from the Telematica Institut in Enschede, Netherlands.

Notes

1. Note that the US Census Bureau potentially underestimates total consumer-oriented e-commerce activity, since the Census does not include online travel, financial services, and ticket agencies in their retail sample. However, the Census data includes transactions where the order took place online, but not necessarily the payment.
2. Some industries had less than 350 firms in each NAICS code.

References

- Afuah, A. and Tucci, C. (2001) *Internet Business Models and Strategies: Text and Cases*, New York: McGraw-Hill Irwin.
- Anonymous (2000) 'The 10 Driving Principles of the New Economy' *Business 2.0* online at: <http://www.business2.com/articles/mag/0,1640,13513,00.html> [accessed 15 March 2002].
- Anonymous (2004a) 'Active Internet Users by Country, August 2004' *ClickZ Network* September 22, online at: [http://www.clickz.com/stats/big_picture/geographics/article.php/3410261] [accessed 19 April 2005].
- Anonymous (2004b) 'Majority of US Consumers Research Online, Buy Offline', *ClickZ Network* October 6, online at: <http://www.clickz.com/stats/markets/retailing/article.php/3418001> [accessed 19 April 2005].
- Bailey, J. (1998) 'Internet Price Discrimination: Self-Regulation, Public Policy, and Global Electronic Commerce', *Proceedings of the Twenty-Sixth Annual Telecommunications Policy Research Conference*, Washington, DC.
- Bakos, J. Y. (1997) 'Reducing Buyer Search Costs: Implications for Electronic Marketplaces', *Management Science* 43(12): 1676–92.
- Bakos, J. Y. and Treacy, M. E. (1986) 'Information Technology and Corporate Strategy: A Research Perspective', *MIS Quarterly* 10(2): 107–19.
- Barnes, D. L., Hinton, C. M. and Mieczkowska, S. M. (2004) 'Managing the Transition from Bricks-and-Mortar to Clicks-and-Mortar: A Business Perspective', *Knowledge and Process Management* 11(3): 199–209.
- Berelson, B. (1952) *Content Analysis in Communication Research*, New York: Free Press.
- Budd, R. W., Thorp, R. K. and Donohew, L. (1967) *Content Analysis of Communications*, New York: Macmillan: 33–6.
- Brynjolfsson, E., Hitt, L. M. and Yang, S. (2002) 'Intangible Assets: Computers and Organizational Capital', *Brookings Papers on Economic Activity: Macroeconomics* (1): 137–99.
- Cairncross, F. (1997) *The Death of Distance*, Boston, MA: Harvard Business School Press.
- Choi, S., Stahl, D. O. and Whinston, A. (1997) *The Economics of Electronic Commerce: The Essential Economics of Doing Business in the Electronic Marketplace*, Indianapolis: Macmillan.
- Chwelos, P. and Brydon, M. J. (2000) 'Clicks vs. Bricks: Toward a Model of Internet-Induced Channel Competition', *Proceedings of the Twenty-First International Conference on Information Systems*, 526–31, Brisbane, Australia.
- DiMaggio, P. and Louch, H. (1998) 'Socially Embedded Consumer Transactions: For What Kinds of Purchases Do People Most Often Use Networks?', *American Sociological Review* 63(5): 619–37.
- Dou, W., Nielsen, U. and Tan, C. (2002) 'Using Corporate Websites for Export Marketing', *Journal of Advertising Research* 42(5): 105–15.
- Fallows, D. (2004) *The Internet and Daily Life*, Washington: PEW Internet and American Life Project, online at: http://www.pewinternet.org/PPF/r/131/report_display.asp [accessed 14 March 2005].
- Friedman, L. G. and Furey, T. R. (1999) *The Channel Advantage: Going to Market with Multiple Sales Channels to Reach More Customers, Sell More Products, Make More Profit*, Boston: Butterworth Heinemann.

- Granovetter, M. (1985) 'Economic Action and Social Structure: The Problem of Embeddedness', *American Journal of Sociology* 91(3): 481–510.
- Gupta, A., Su, B. and Walter, Z. (2004) 'An Empirical Study of Consumer Switching from Traditional to Electronic Channels: A Purchase-Decision Process Perspective', *International Journal of Electronic Commerce* 8(3): 131–61.
- Iyer, N., Kim, D. and Rao, H. R. (2004) 'Information Assurance in B2C Websites for Information Goods/Services', *Electronic Markets* 14(4): 344–59.
- Johnston, H. R. and Vitale, M. R. (1988) 'Creating Competitive Advantage with Interorganizational Information Systems', *MIS Quarterly* 12(2): 153–65.
- Klein, L. R. (1998) 'Evaluating the Potential of Interactive Media through a New Lens: Search versus Experience Goods', *Journal of Business Research* 41(3): 195–203.
- Laudon, K. and Traver, C. (2003) *E-commerce: Business, Technology, Society*, (2nd edn), Boston: Addison-Wesley.
- Malone, T., Yates, J. and Benjamin, R. (1987) 'Electronic Markets and Electronic Hierarchies: Effects of Information Technology on Market Structure and Corporate Strategies', *Communications of the ACM* 30(6): 484–97.
- McMillan, S. J. (2000) 'The Microscope and the Moving Target: The Challenge of Applying Content Analysis to The World Wide Web', *Journalism and Mass Communication Quarterly* 77(1): 80–98.
- Molesworth, M. and Suortti, J. (2002) 'Buying Cars Online: The Adoption of the Web for High-Involvement, High-Cost Purchases', *Journal of Consumer Behavior* 2(2): 155–68.
- Otto, J. and Chung, Q. (2000) 'A Framework for Cyber-Enhanced Retailing: Integrating E-Commerce Retailing with Brick and Mortar Retailing', *Electronic Markets* 10(4): 185–91.
- Pine, B. J. and Gilmore, J. H. (1999) *The Experience Economy: Work is Theatre and Every Business a Stage*, Boston: Harvard Business School Press.
- Porter, M. E. (1985) *Competitive Advantage: Creating and Sustaining Superior Performance*, New York: Free Press.
- Porter, M. E. and Millar, V. (1985) 'How Information Gives You Competitive Advantage', *Harvard Business Review* 63(4): 149–60.
- Prasarnphanich, P. and Gillenson, M. L. (2003) 'Virtual Extension: The Hybrid Clicks and Bricks Business Model', *Communications of the ACM* 46(12): 178–85.
- Rappa, M. (2005) 'Business Models on the Web', *Managing the Digital Enterprise*, online at: <http://digitalenterprise.org/models/models.html> [accessed 14 March 2005].
- Rosen, K. T. and Howard, A. L. (2000) 'E-retail: Gold Rush or Fool's Gold?', *California Management Review* 42(3): 72–100.
- Rust, R. T. and Cooil, B. (1994) 'Reliability Measures for Qualitative Data: Theory and Implications', *Journal of Marketing Research* 31: 1–14.
- Saeed, K. A., Grover, V. and Hwang, Y. (2003) 'Creating Synergy with a Clicks and Mortar Approach', *Communications of the ACM* 46(12): 206–12.
- Steinfeld, C. and Klein, S. (1999) 'Local vs. Global Issues in Electronic Commerce', *Electronic Markets* 9(1/2): 45–50.
- Steinfeld, C. and Whitten, P. (1999) 'Community Level Socio-Economic Impacts of Electronic Commerce', *Journal of Computer Mediated Communication* 5(2), online at: <http://jcmc.indiana.edu/vol5/issue2/steinfield.html> [accessed 14 November 2004].
- Steinfeld, C., Adelaar, T. and Lai, Y.-J. (2002a) 'Integrating Brick and Mortar Locations with E-Commerce: Understanding Synergy Opportunities', *Proceedings of the Thirty-Fifth Annual Hawaii International Conference on Systems Sciences*, Big Island, Hawaii: IEEE Computer Society.
- Steinfeld, C., Bouwman, H. and Adelaar, T. (2002b) 'The Dynamics of Click and Mortar E-Commerce: Opportunities and Management Strategies', *International Journal of Electronic Commerce* 7(1): 93–119.
- Steinfeld, C., DeWit, D., Adelaar, T., Bruin, A., Fiel, E., Smit, A., Hoefsloot, M. and Bouwman, H. (2001) 'Pillars of Virtual Commerce: Leveraging Physical and Virtual Presence in the New Economy', *Info* 3(3): 203–13.
- Steinfeld, C., Mahler, A. and Bauer, J. (1999) 'Electronic Commerce and the Local Merchant: Opportunities for Synergy between Physical and Web Presence', *Electronic Markets* 9(1/2): 51–7.
- Stern, L. W. and Ansary, A. I. (1992) *Marketing Channels*, Englewood Cliffs, NJ: Prentice Hall.
- Teece, D. J. (1986) 'Profiting from Technological Innovation: Implications for Integration, Collaboration, Licensing and Public Policy', *Research Policy* 15: 285–306.
- Tornatsky, L. and Klein, K. (1982) 'Innovation Characteristics and Innovation Adopting-Implementation: A Meta-Analysis of Findings', *IEEE Transactions on Engineering Management* EM-29: 28–45.
- US Census Bureau (2004) 'Census Bureau reports', online at: <http://www.census.gov/mrts/www/current.html> [accessed 6 October 2004].
- Viswanathan, S. (2000) 'Competition across Channels: Do Electronic Markets Complement or Cannibalize Traditional Retailers', *Proceedings of the Twenty-First International Conference on Information Systems*, 513–19, Brisbane, Australia.
- Ward, M. R. (2001) 'Will Online Shopping Compete More with Traditional Retailing or Catalog Shopping?', *Netnomics* 3(2): 103–17.
- Wigand, R. (1997) 'Electronic Commerce: Definition, Theory, and Context', *The Information Society* 13: 1–16.
- Wigand, R. and Benjamin, R. (1995) 'Electronic Commerce: Effects on Electronic Markets', *Journal of Computer Mediated Communication* 13, online at: <http://jcmc.indiana.edu/vol1/issue3/wigand.html> [accessed 6 October 2004].

- Wildman, S. and Guerin-Calvert, M. (1991) 'Electronic Services Networks: Functions, Structures, and Public Policy', in M. Guerin-Calvert and S. Wildman (eds) *Electronic Services Networks: A Business and Public Policy Challenge*, New York: Praeger, pp. 3–21.
- Williamson, O. (1975) *Markets and Hierarchies: Analysis and Antitrust Implications*, New York: Free Press.
- Williamson, O. (1985) *The Economic Institutions of Capitalism*, New York: Free Press.
- Zhu, K. and Kraemer, K. (2002) 'Electronic Commerce Metrics: Assessing the Value of E-commerce to Firm Performance with Data from the Manufacturing Sector', *Information Systems Research* 13(3): 275–95.