Interactive Technologies and Retailing Strategy: A Review, Conceptual Framework and Future Research Directions

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Abstract

During the past decade, a number of interactive technologies, including the Internet, have fundamentally transformed how retailers compete in the marketplace. In a similar vein, emerging interactive technologies can be expected to significantly alter the retailing landscape through their impact on retailing strategy and operations. Furthermore, it is conceivable that certain emerging interactive technologies will be perceived by some retailers as enablers (tools to more effectively compete in the marketplace) and by other retailers as disruptors of the present ways of doing business. Interactive technologies can either be generic, a technology that is readily available from an information technology (IT) vendor and is widely adopted by retailers, or proprietary. An interactive technology that is proprietary can enable a firm to generate economic rents from the innovation for an extended duration of time. Investing in a generic interactive technology, however, may be perceived as a cost of doing business for a retailer, and not a potential source of sustainable competitive advantage. However, a retailer’s complementary resource endowments may enable the retailer to more effectively leverage a generic technology relative to its competitors and thereby achieve a sustainable competitive advantage. In this paper, we review the related literature, develop a process model delineating the mechanisms by which an interactive technology can affect and necessitate changes in retailers’ strategies and identify directions for future research.

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Keywords: Interactive technology; Interactive retailing technology; Retailing strategy; Strategic capabilities

Introduction

Historically, technological innovations have played a major role in shaping the retail landscape of the time. Today, a wave of interactive technologies, many of which are enabled by the Internet, are forcing retailers to rethink the way they do business (e.g., Pavlou and Stewart 2000; Stewart and Pavlou 2002). For instance, Internet-based interactive technologies have allowed retailers to employ radically new business models (e.g., Amazon.com; Netflix), reach customers in new ways (e.g., Google’s AdWords), revolutionize the supply, handling and delivery of products (e.g., Customer Relationship Management (CRM) systems), allow customers to interact with each other (e.g., blogs, feedback forums, online product reviews, Web 2.0), provide tools for communication and negotiation among buyers and sellers, and significantly enhance the customers’ online experience (e.g., through virtual try-on and online communities).

Interactive technologies are also reshaping the competitive retailing landscape by rendering obsolete some traditional business models (e.g., the standalone offline travel agency), transferring more power to customers (e.g., with online and mobile technologies that enable consumers to engage in on-the-spot online and offline price comparisons anytime, from any location), and enabling smaller firms to overcome the traditional economies of scale related advantages of larger firms by aggregating bargaining power (e.g., websites like GroupChina that allow small companies to outsource manufacturing to
Interactive Technology: Definition and Constituent Dimensions

While interactive technology can be generally viewed as a technology that enables customers to interact with retailers, a formal definition is useful to guide academic discourse. Therefore, we offer the following definition:

“Interactive technology refers to methods, tools or devices that allow various entities (individuals, machines, or organizations) to engage in mediated communication to facilitate the planning and consummation of exchanges between them.”

In specific reference to communication exchange relationships in retail settings, the principal entities of interest are the focal retailer, its current and potential customers, suppliers, partners, and employees. The term ‘technology’ is used broadly to include knowledge and/or methods, tools or devices that mediate (i.e., facilitate) communication, including Internet-enabled technologies that convert inputs (e.g., information about consumers’ preferences) into outputs (e.g., information about product offerings, product offerings etc.). The term ‘interactive’ denotes that the mediated communication has the following characteristics: bidirectionality, timeliness, mutual controllability, and responsiveness (see Bolton and Saxena-Iyer 2009; Deighton and Kornfeld 2009; Shankar and Malthouse 2006; Yadav and Varadarajan 2005). The experience of the communicating entities determines the quality of mediated communication on these characteristics of mediated communication.

Two specific aspects of our definition of interactive technology merit elaboration. First, our definition of interactive technology suggests that interactive technologies vary substantively on their degree of interactivity (Bolton and Saxena-Iyer 2009). While at the low-end of interactivity, interactive technology includes static web pages and some self-service technologies such as automated teller machines (Meuter et al. 2000), at the high-end of interactivity, it includes high bandwidth mobile marketing technology technologies (Shankar and Balasubramanian 2009) and Web 2.0 marketing with social networking applications. Second, our definition of interactive technology is broad in terms of its scope. The communicating entities can either be persons (e.g., communication between two individuals mediated by an interactive device), or a person and a machine (e.g., communication between an individual and a computer mediated by an interactive device such as a kiosk at a retail outlet), or even two pre-programmed machines (e.g., two computers or websites negotiating the terms of a transaction).

Illustrative of uses of interactive technologies in the retailing context include information acquisition (e.g., a potential buyer being able to access information from a seller’s computer), trials of virtual products (e.g., a potential buyer being able to try out an apparel in various colors with the aid of a virtual mirror at a retail outlet), and facilitation of purchase decisions (e.g., a potential buyer being able to customize and place an order for a PC with the aid of a kiosk at a retail outlet). Business-to-business retailing applications also include technologies such as the use of radio frequency identification (RFID) to create a high-visibility supply chain management infrastructure and supply chain tools to enable automated information exchange across partners.

Retailing Strategy: Definition and Constituent Dimensions

Retailing strategy can be broadly conceptualized as how a retailer chooses to compete in the marketplace and the markets and market segments that the retailer chooses to serve. The question of how to compete in the marketplace includes a number of inter-related decisions. A coherent retailing strategy also requires that these decisions be internally consistent. Implementation of these decisions manifests in the behavior of the firm in the marketplace directed at customers, competitors, and/or other key constituencies including supply chain partners and even employees. The constituent dimensions and sub-dimensions of retailing strategy include, but are not limited to, the following:

- Business model
- Customer mix (e.g., markets and market segments to serve)
- Retailing mix
  - Positioning
  - Distribution channels (e.g., single versus multi-channel)
  - Product (e.g., merchandise assortment)
  - Price (e.g., price points)
  - Promotion
  - Atmospherics
- Customer-focused retailing programs directed toward:
  - Acquisition of new customers
  - Retention of present customers
  - Enhancement of customers’ experiences

While the above activities reflect our perspective on the principal dimensions of retailing strategy, developments in the marketing literature provide a lens into an alternative perspective as well. For instance, in 2007, the American Marketing Association (AMA) adopted the following as its official...
definition of marketing (Marketing News 2008, p. 28): “Marketing is the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large.” On the one hand, from the standpoint of producers, marketing intermediaries such as retailers play a key role in value delivery. However, viewed independent of their relationship with producers, value creation, value communication, and value delivery are also central to retailing strategy. Hence, retailing strategy can also be broadly conceptualized as a retailer’s choice of specific activities and behaviors in the marketplace for creating, communicating and delivering value to its target customers.

Impact of Technological Innovations on Retailing: An Overview

The late 19th and early 20th centuries were characterized by tremendous changes on the technological front. Although many of these technological developments neither originated in the retailing sector nor were developed primarily for transforming the retailing sector, retailers were often among the early adopters of new technologies (Tamilia 2007). In addition, new technologies also spurred a number of significant disruptions in the retailing sector (Christensen and Tedlow 2000). Table 1 provides an illustrative overview of the impact of technologies on retailing strategies and operations. Broadly, we classify these technologies as (a) transportation infrastructure technologies, (b) broadcast communication technologies, and (c) interactive technologies. A retrospective look at technological developments (see panels A and B in Table 1) serves two important purposes: they highlight the significant, long-term impact of technology on retailing, and they provide insights for understanding the implications for retailing of new interactive technologies (see panel C), which we examine in this paper.

Infrastructure Technologies

The development and diffusion of infrastructure technologies has had an enormous impact on retailing in the latter half of the 19th century and in the early 20th century. According to Tedlow (1990), it was largely due to these technologies (primarily transportation-related) that retailing evolved from its fragmentation stage to the unification stage. The fragmentation stage was associated with a large number of small-scale retailers dispersed in local geographical markets that operated with relatively little influence on each other. Transaction volumes during this stage tended to be low and prices (and margins) were high. The unification stage in retailing, facilitated by transportation efficiencies, saw the emergence of the first department store chains with regional (and later) national ambitions. Transaction volumes rose during this period, while price levels (and margins) declined.

The development and rapid adoption of the automobile represents an excellent case study to illustrate the influences of emerging technologies on retailing (see Tedlow 1990). To appreciate how quickly these changes unfolded, it is worth noting that, in 1899, when the automotive sector was first mentioned in the US Census of manufacturing, it was ranked last (150) among all manufacturing sectors. Ford Motor Company sold a mere 5986 Model Ts in 1908; by 1916, sales had increased almost tenfold. By the time, the Model T was officially discontinued in 1927, the automotive sector was rapidly expanding and some prescient firms realized the potentially far-reaching implications of these changes. Among retailers, Sears was the first to recognize that the changes in the automotive sector represented the end of the rural era in...
America and that the automobile would continue to be a catalyst for even more rapid changes. By 1935, Sears had 428 stores (up from only 8 in 1925), accounting for more than half of its total sales. A decade earlier, retail store sales represented less than five percent of Sears’ business. By being prescient and rapidly rolling out retail stores, Sears established a strong competitive position that would last for decades.

Direct competitors such as Montgomery Ward that failed to see the far-reaching effects of the automobile on the retailing sector ended up ceding significant competitive positions to Sears. By the time Montgomery Ward fully grasped the changing retailing landscape and started its own retail store expansion strategy, quality real estate in the emerging suburban areas was unavailable due to long-term leases or other contractual agreements.

Broadcast Communication Technologies

As with infrastructure technologies related to transportation, the growth of broadcast communication technologies also triggered many changes for retailers (Fidler 1997). New technologies such as television and radio had many social and economic ramifications, although it took decades for the complete scope of those ramifications to become evident. In the case of radio, for instance, the basic technological ideas were in place in 1899 when Guglielmo Marconi demonstrated wireless communication. For the next twenty years, radio technology remained in the realm of experimentation (e.g., by thousands of amateur broadcasters) and there was little clarity about its commercialization possibilities. However, some prominent retailers (e.g., Strawbridge & Clothier’s, Wanamakers, and Gimbel Brothers) were attracted to this new medium of communication and even opened their own radio stations (Tyler 1992). Smaller retailers who did not have the financial resources for owning radio stations formed alliances to share costs. At that time, music was an important element of radio programming, and retailers considered music an important tool to enhance the ambiance of their store environments. The use of radio-in-stores, as a retailing strategy for attracting and retaining customers, waned in the latter part of the 1920s, in part, due to the need for austerity measures during the Depression era. The combination of Radio Corporation of America (RCA) and National Broadcasting Corporation (NBC) created the first national market for radio programming, providing a new and low-cost way to reach a geographically dispersed customer base. It was the creation of this national radio market that provided retailers, over the long-term, a foundation for more efficient, national advertising and promotion, which in turn, led to the growth of large, regional and national retail chains.

Interactive Technologies

The developments listed in Table 1 (panel C) represent a small sub-set of relatively new interactive technologies. What impact are these technologies likely to have on retailing strategy? A perusal of interactive technologies suggests that, compared to the developments discussed above, many novel communication-related functionalities are embedded in them. For example, the scalability (the ability to grow a network of communicators), precision (the ability to target particular individuals), and mobility (the ability to serve a group of mobile users in real time) of this generation of technologies are superior to earlier generation technologies. Yet, interactive technologies represent a continuation of capabilities that resulted from earlier technological developments, such as the telephone, radio, and television — specifically their potentially dramatic effects on competitive landscapes across several industries, including retailing. While new applications are continually being developed, the current generation of interactive technologies is being deployed in a variety of different ways in retailing — facilitating search, targeted advertising, mobile payment applications, etc.

As we explore the potential effects of the current and emerging generation of interactive technologies on retailing strategies, it is imperative that we keep in mind the insights and lessons from the previous generations of technologies (see, e.g., Fidler 1997; Varadarajan and Yadav 2002; Yadav and Varadarajan 2005). Specifically, although many of these technological developments neither originated in the retailing sector nor were developed primarily for transforming the retailing sector, they had substantial and dramatic effects on retailing. Second, these technologies not only provided opportunities to retailers, but also, in some cases, disrupted retailers’ strategies. We expect this pattern to continue, and perhaps strengthen, in the future with new interactive technologies that offer even more sophisticated functionalities and tools.

Research on the Impact of Interactive Technologies: A Review

In this section, we provide a brief overview of the related literature on interactive technologies. As shown in Table 2, researchers studying interactive technologies have used a variety of different methods including field studies, experiments, surveys, and secondary data. We organize prior research under three broad themes: (1) effects of interactive technologies on consumers; (2) effects of interactive technologies on retailers’ capabilities; and (3) effects of interactive technologies on business models. A brief discussion of each of these themes follows.

Effects of Interactive Technologies on Consumers

A dominant theme in the literature is the dramatic effects of interactive technologies on consumers. With respect to adoption of interactive technologies by consumers, prior research has examined various factors, including the attitudes and experiences of consumers with an interactive technology (Reinders, Dabholkar, and Frambach 2008), their cognitive styles (Simon and Usunier 2007), the impersonal characteristics of the interactive technology (McCcartan-Quinn, Durkin, and O’Donnell 2004), transaction uncertainty (Pavlou, Liang, and Xue 2007), building institutional trust (Pavlou and Gefen 2004),
### Table 2
Research on interactive technologies: A review.

<table>
<thead>
<tr>
<th>Study</th>
<th>Research focus</th>
<th>Empirical context</th>
<th>Key findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ba and Pavlou (2002)</td>
<td>Feedback mechanisms in eBay’s online auctions</td>
<td>Secondary data from eBay’s auctions</td>
<td>The feedback mechanism facilitates transactions in eBay’s online auctions by building trust in sellers. New technologies can enhance the shopping experience, but applications must be tailored to consumer segments and product categories.</td>
</tr>
<tr>
<td>Burke (2002)</td>
<td>Technology and the customer interface</td>
<td>Online customers</td>
<td>Creation of the online shopping webmosphere through more effective design of interactive retail shopping environments can improve customers’ experiences.</td>
</tr>
<tr>
<td>Childers, Carr, Peek, and Carson (2001)</td>
<td>Hedonic and utilitarian motivations in shopping behavior</td>
<td>Online retailers</td>
<td>Image interactivity technology (IIT), which enables the creation and manipulation of product images on a retailer’s web site, improves experiential value and instrumental value.</td>
</tr>
<tr>
<td>Fiore, Kim, and Lee (2005)</td>
<td>Effect of image interactivity technology on consumer responses toward the online retailer</td>
<td>Online retailing</td>
<td>RFID adoption involves balancing positive consequences of adoption such as reduction of shrinkage, improved customer satisfaction with negative consequences of adoption such as increased concerns of privacy.</td>
</tr>
<tr>
<td>Hu, Pavlou, and Zhang (2009)</td>
<td>Examine potential biases in product reviews on Amazon and other retailers</td>
<td>Product reviews on Amazon</td>
<td>Two self-selection biases in online product reviews render the average rating a biased estimator of true product quality.</td>
</tr>
<tr>
<td>Jones, Clarke-Hill, Hillier, and Comfort (2005)</td>
<td>Highlight the benefits and challenges of RFID adoption</td>
<td>Not applicable</td>
<td>Technical infrastructure is critical in RFID driven benefits that is reaped by the retailer.</td>
</tr>
<tr>
<td>Kim and Forsythe (2008a)</td>
<td>Adoption of virtual try-on</td>
<td>Online apparel shopping</td>
<td>The interactivity and customer involvement of virtual try-on can enhance the online shopping experience. Sensory enabling technology improves online shopping experience by reducing product risk perceptions or by increasing perceived entertainment value.</td>
</tr>
<tr>
<td>Kim and Forsythe (2008b)</td>
<td>Sensory enabling technology</td>
<td>Experiments</td>
<td>While IVR saves costs for banks, customers reject IVR, because of its impersonality.</td>
</tr>
<tr>
<td>Kim, Ko, Kim, and Koh (2008)</td>
<td>Benefits of RFID technologies</td>
<td>Survey data from Korea and USA</td>
<td>The content of feedback text comments has a much stronger effect on price premiums and transactions than the more quantified numerical feedback ratings.</td>
</tr>
<tr>
<td>McCartan-Quinn, Durkin, and O’Donnell (2004)</td>
<td>Interactive voice retailing (IVR)</td>
<td>Retail banking</td>
<td>Theory of planned behavior can be used to identify and test the most important predictors of browsing and purchasing online. It variables more important predictors than traditional marketing variables.</td>
</tr>
<tr>
<td>Nantel (2004)</td>
<td>Virtual reality</td>
<td>Online apparel</td>
<td>Description of virtual reality systems to help customers try on clothes. Shows that a degree of challenge is important for continued engagement of the customer. The more important the consumers considered the web, the more likely they were to focus their attention on the website. Higher levels of interactivity were not associated with greater attention.</td>
</tr>
<tr>
<td>Novak, Hoffman, and Yung (2000)</td>
<td>Examine what makes web a compelling consumer experience by developing and operationalizing the flow construct</td>
<td>Large sample web based survey</td>
<td>Shows that a degree of challenge is important for continued engagement of the customer. The more important the consumers considered the web, the more likely they were to focus their attention on the website. Higher levels of interactivity were not associated with greater attention.</td>
</tr>
<tr>
<td>Pavlou and Dimoka (2006)</td>
<td>Examine the content of text feedback comments on eBay that consumers write for sellers</td>
<td>Combination of archival and survey data</td>
<td>The content of feedback text comments has a much stronger effect on price premiums and transactions than the more quantified numerical feedback ratings.</td>
</tr>
<tr>
<td>Pavlou and Fygenson (2006)</td>
<td>Examine what drives consumers to browse websites and purchase products online</td>
<td>Large-scale survey of online consumers</td>
<td>Theory of planned behavior can be used to identify and test the most important predictors of browsing and purchasing online. It variables more important predictors than traditional marketing variables.</td>
</tr>
<tr>
<td>Pavlou and Gefen (2004)</td>
<td>Examine how institutional factors can help build effective online marketplaces by facilitating consumer transactions</td>
<td>Combination of archival and survey data from Amazon</td>
<td>Institutional structures (feedback mechanism, escrow services, credit card guarantees, intermediary) facilitate online transaction by building trust and reducing risk. Transaction uncertainty reduces actual transactions, especially for important purchases, and it is reduced by trust, product diagnosticity, and social presence.</td>
</tr>
<tr>
<td>Pavlou, Liang, and Xue (2007)</td>
<td>Examine the antecedents and consequences of transaction uncertainty in electronic commerce</td>
<td>Two large-scale survey studies</td>
<td>Forcing consumers to adopt TBSS has severe negative consequences. Negative attitudes towards TBSS are translated into reduced positive WOM intentions and increased switching intentions. People who had previous TBSS experiences viewed it more positively. Rational engagement style has a strong positive effect on the preference for using SST for complex services, while experiential style has a negative effect on SST.</td>
</tr>
<tr>
<td>Reinders, Dahbolkar, and Frambach (2008)</td>
<td>Examine the impact of forcing consumers to use technology based self-service (TBSS)</td>
<td>Ticketing and travel information in the context of Dutch railways</td>
<td>Forcing consumers to adopt TBSS has severe negative consequences. Negative attitudes towards TBSS are translated into reduced positive WOM intentions and increased switching intentions. People who had previous TBSS experiences viewed it more positively. Rational engagement style has a strong positive effect on the preference for using SST for complex services, while experiential style has a negative effect on SST.</td>
</tr>
<tr>
<td>Simon and Usunier (2007)</td>
<td>Consumer preference for personnel-in-contact versus self service technologies (SST) is explained through the role of cognitive styles (namely rational vs. experiential)</td>
<td>115 questionnaires filled by people who had used the services in the past 12 months</td>
<td>When adopting a RFID supported VMI, one needs to consider shelf-space availability and RFID tag costs in establishing profits of the system.</td>
</tr>
<tr>
<td>Szmerekovksy and Zhang (2008)</td>
<td>Examine the affect of RFID tags on manufacturer and retailer vendor management systems.</td>
<td>Not applicable</td>
<td>When adopting a RFID supported VMI, one needs to consider shelf-space availability and RFID tag costs in establishing profits of the system.</td>
</tr>
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</table>
Table 2 (continued)

<table>
<thead>
<tr>
<th>Study</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Uhric, Sandner, Resatsch, Leimeister, and Kremar (2008)</td>
<td>Examines the opportunities for RFID to improve a marketing relationship capability</td>
<td>Secondary data and interviews</td>
<td>Six RFID applications are discussed that can influence customer acquisition, customer retention or recovery from failure.</td>
</tr>
<tr>
<td>Van Alstyne and Brynjolfsson (2005)</td>
<td>To show that improved communications access and filtering technologies need not always result in a global village, but could lead to more fragmented social and intellectual interaction (as communities are formed based on individual preferences)</td>
<td>Not applicable</td>
<td>Develops a metric of knowledge distance. Show that under certain conditions, specialization and fragmentation can be economically efficient and stable in the sense that no individual can be made better off by changing their personal affiliations.</td>
</tr>
</tbody>
</table>

**Effects of interactive technologies on retailers' capabilities**

<table>
<thead>
<tr>
<th>Study</th>
<th>Research focus</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Cudmore and Patton (2007)</td>
<td>Direct market strategies in wireless environments</td>
<td>Not applicable</td>
<td>Given the accessibility afforded by two-way communication and the interactivity of the medium, firms can develop a more intimate understanding of their customers resulting in more customized marketing.</td>
</tr>
<tr>
<td>Keeling, McGoldrick, and Macaulay (2006)</td>
<td>Modeling customer acceptance</td>
<td>Electronic kiosks in retail service delivery</td>
<td>In-store interactive kiosks using Internet technology represent a channel through which offering wide-ranging informational, transactional, promotional, and CRM benefits.</td>
</tr>
<tr>
<td>Lustria (2007)</td>
<td>The effects of Web interactivity on comprehension, persuasion, and attitudes</td>
<td>Experiment with 441 students</td>
<td>The Internet's interactive capabilities enhance the persuasion and comprehension capabilities of websites.</td>
</tr>
<tr>
<td>Mylonakis (2005)</td>
<td>Converting offline to online consumers</td>
<td>Survey with 512 Internet users</td>
<td>The Internet's interactive technologies enable companies to convert offline customers to loyal online customers.</td>
</tr>
<tr>
<td>Nakata and Zhu (2006)</td>
<td>Information technology and customer orientation: a study of direct, mediated, and interactive linkages</td>
<td>Not applicable</td>
<td>Greater IT capabilities are associated with higher customer orientation but in mediated and interactive ways with marketing information quality and organizational trust.</td>
</tr>
<tr>
<td>Ou, Davison, Pavlou, and Li (2008)</td>
<td>Examines the existence and role of guanxi (buyer's perception of a close and pervasive interpersonal relationship with a seller) in Chinese online marketplaces</td>
<td>Combination of archival and survey data from Taobao.</td>
<td>Retailers can build guanxi in their buyers by increasing the interactivity and social presence of their storefronts by facilitating Instant Messaging communication.</td>
</tr>
<tr>
<td>Shah and Murtaza (2005)</td>
<td>Customer relationship management and web services</td>
<td>Not applicable</td>
<td>Interactive technologies in the form of web services enhance CRM effectiveness, improve customers' overall experience, and increase their level of engagement with the firm.</td>
</tr>
<tr>
<td>Shi and Salesky (1994)</td>
<td>Building a strategy for electronic home shopping</td>
<td>Not applicable</td>
<td>Marketing managers develop versatile strategies for interactive marketing applications to account for the ever-changing nature of the IT infrastructure.</td>
</tr>
<tr>
<td>Zhang and Krishnamurthi (2004)</td>
<td>Decision-support system of micro-level customized promotions.</td>
<td>Online stores</td>
<td>An optimization procedure to derive the optimal amount of price discount for each household on each shopping trip.</td>
</tr>
<tr>
<td>Zhu and Kraemer (2005)</td>
<td>Interactivity of e-commerce technologies.</td>
<td>Secondary data from firms in 10 countries</td>
<td>The interactivity of e-commerce technologies was shown to enhance the front-end and back-end capabilities of retailing firms and contribute to e-business value.</td>
</tr>
</tbody>
</table>

**Effects of interactive technologies on business models**

<table>
<thead>
<tr>
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<th>Empirical context</th>
<th>Key findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chen (2003)</td>
<td>Value of business models: Key factors determining the survival or failure of new business models</td>
<td>Not applicable</td>
<td>New e-technologies such as mobile Internet phones and interactive television are widely predicted to generate a wealth of opportunities through the creation of new e-business models.</td>
</tr>
<tr>
<td>Granados, Kauffman, and King (2008)</td>
<td>Digital intermediaries in the travel industry</td>
<td>Not applicable</td>
<td>Interactive systems enabled by the Internet have transformed the industry by reducing barriers to entry, increasing the number of new competitors and making existing players, such as travel agencies, vulnerable to disintermediation.</td>
</tr>
<tr>
<td>Rayport, Jaworski, and Kyung (2005)</td>
<td>Companies' customer interfaces</td>
<td>Not applicable</td>
<td>Successfully integrating technology into the work force requires a wholesale reengineering of retailing operations.</td>
</tr>
</tbody>
</table>

and the characteristics of the underlying e-commerce technologies (Pavlou and Fygenson 2006).

Much of the extant literature has focused on the positive effects of interactive technologies on consumers' experiences. For instance, Novak, Hoffman, and Yung (2000) examine the role of the construct of “flow” (a psychological state when a person is fully immersed in what he or she is doing) on consumers' web experiences. Ba and Pavlou (2002) and Pavlou and Dimoka (2006) link the interactivity of eBay's feedback mechanism to building trust in sellers and price premiums for
high quality sellers. Childers et al. (2001) find that the creation of an online shopping websphere, through more effective design of interactive retail shopping environments, improves the consumers’ online experience. Hu, Pavlou, and Zhang (2009) link the interactivity of online product reviews to product sales. Finally, prior research shows that two features of interactive self-service technologies – comparative information and interactivity – affect consumers’ perceived control and interface evaluation (e.g., Zhu et al. 2007).

Studies have also focused on the effects of specific interactive technologies on consumers’ experiences. Fiore, Kim, and Lee (2005) show that image interactivity technologies (technologies which enable the creation and manipulation of images of products on a retailer’s website) improve consumers’ experiential and instrumental value. Kim and Forsythe (2008a) and Nantel (2004) highlight the role of virtual try-on functionality in enhancing consumers’ experiences. Ou et al. (2008) show that the use of Instant Messaging tools in Taobao’s (www.taobao.com) online marketplace (termed WangWange) facilitate repeat consumer-seller transactions by facilitating the sense of interactivity and social presence. Leveraging sensory enabling technology to enhance consumers’ experiences has also been examined in prior research (e.g., Kim and Forsythe 2008b).

While new interactive technologies generally tend to improve consumers’ experiences, their positive effects are not uniform across different consumer segments (Burke 2002). Furthermore, adoption of interactive technologies like mobile technology requires firms to consider trade-offs between the ability to access customers at any instant versus the intrusive nature of these communications (Shankar et al. 2010). Interestingly, there is also some evidence that suggests that interactive technologies do not unilaterally improve consumers’ experiences. In the context of retail banking, interactive voice retailing has been reported to be too impersonal and to lower the quality of consumers’ experiences, resulting in dissatisfaction among many consumers (McCartan-Quinn, Durkin, and O’Donnell, 2004). Likewise, Hu, Pavlou, and Zhang (2009) report that online product reviews may offer misleading comparative information – competitive price comparisons and potential opportunity to quickly react to negative WOM (like online user comments), thereby maintaining high levels of goodwill. Given the accessibility afforded by two-way communication and interactivity, retailers can develop an intimate understanding of their customers to create more effective and customized marketing programs (Cudmore and Patton 2007). The interactive nature of the Internet also allows retailers to convert offline customers to loyal online customers (Mylonakis 2005) and enhance the persuasion capabilities of their websites (Lustria 2007). Interactive technologies also allow retailers to enhance their operational efficiency. Case in point is the use of Radio Frequency Identification (RFID) technology by retailers to “improve inventory management, store operation and demand management” (Kim et al. 2008). RFID technology enables retailers to better serve customers through more precise targeting, better customer service, reduced shoplifting and easier product return processes (Uhrich et al. 2008; Jones et al. 2005). RFID technology allows greater sharing of price information between retailers and manufacturers leading to better pricing efficiency and flexibility (Szmerkovsky and Zhang 2008). Importantly, RFID technology affords retailers the ability to rapidly share pertinent information with their supply chain and ecosystem in order to effectively respond to changes in the market (Jones et al. 2005). Taken together, interactive technologies, such as RFID, can have a dramatic impact on retailing operations. However, it is important to acknowledge that Kim and Forsythe (2008b) found that successful integration of interactive technology into the work force necessitated a wholesale reengineering of retailing operations.

Effects of Interactive Technologies on Business Models

In the context of business models (i.e., how firms create value and generate revenue), Chen (2003) discusses the effects
of new interactive technologies, such as mobile Internet phones and interactive television, on the destruction and emergence of business models, and identifies key factors that affect the survival (and failure) of new business models. Amit and Zott (2001) describe the wide variety of business models that firms can pursue in the online marketplaces with interactive Internet-based technologies. An example of interactive technologies enabled by the Internet is the transformation of the travel industry by reducing barriers to entry, increasing the number of new competitors (mostly online agencies), and making existing players, such as travel agencies, vulnerable to disintermediation (Granados, Kauffman, and King 2008). Additionally, interactive technologies have also enhanced the transparency of the market pricing mechanism in the travel industry, thus enhancing competition (Granados, Gupta, and Kauffman 2006) and altering the business models of existing and new players in the travel industry. In sum, our review of the extant literature suggests that interactive technologies have multi-faceted, pervasive effects on the behaviors of customers and retailers, and the capabilities of and the business models employed by retailers, all of which will significantly affect retailers’ strategies.

Effects of Interactive Technology on Retail Strategy: A Process Model

Building on extant literature, we present a process model delineating the various paths through which an interactive technology can affect and necessitate changes in a retailer’s current strategy (Fig. 1). As shown in Fig. 1, an interactive technology can either have a direct effect or an indirect effect on a retailer’s strategy. Direct effect refers to the effect of the enhancement of the competitiveness of a retailer achieved by integrating an interactive technology with its other complementary resources on its strategy. Indirect effects refer to the effects of enhancements in the competitiveness achieved by other entities in the retailing system (e.g., suppliers of goods and providers of services to the focal retailer, potential and present competitors of the focal retailer, and present and potential customers of the focal retailer) by integrating an interactive technology with their other complementary resources on the strategies of retailers.

Consider for instance, link A → B1 → C in Fig. 1. Here, B1 denotes a new interactive technology, a resource¹ that enhances the competitiveness of an upstream supplier (i.e., the relative attractiveness of its offering to retailers and/or other entities in the retailing system who comprise its customer base). The disruptive effect of the upstream supplier leveraging this resource may necessitate changes in the present competitive strategy of the focal retailer. The appropriate strategic response (response conducive to superior performance) may be contingent upon certain organizational (D1) and environmental characteristics (D2). Other links delineated in Fig. 1 (A → B2 → C; A → B3 → C; A → B4 → C; and A → B5 → C) are to be interpreted along similar lines. Collectively, the various paths delineated in Fig. 1 serve to highlight the need for retailers to proactively scan the environment to monitor emerging interactive technologies, assess their potential effects on their competitiveness in the marketplace, as well as the competitiveness of the other entities in the retail system, and determine the timing, magnitude, and nature of specific changes in their current strategy that might be warranted as a consequence of the emergent interactive technology. In the discussion below, we provide illustrative examples of how an interactive technology can have a direct effect and an indirect effect on a retailer’s strategy.

Direct effect of interactive technology on retail strategy — internet enabled virtual try on of products (link A → B3 → C)

Interactive technologies that enable a virtual trial of products not only endow retailers with a new competitive resource, but they also have the potential to dramatically affect consumers’ behaviors, which in turn can affect the retailers’ strategies. A major challenge that consumers face when purchasing eyeglasses and sunglasses over the Internet is the inability to physically try on different frames, as is possible at a bricks-and-mortar retailer. FramesDirect.com (http://www.framesdirect.com), an online retailer of eyeglasses, sunglasses and related products, with its patented FrameFinder Virtual Try-On™ System, enables consumers to virtually try on frames and sunglasses online. The interactive technology enables consumers to upload their photographs, superimpose a frame on the photograph, and compare on a single screen different frames fitted on to their digital photo. By partially overcoming one of the key limitations of Internet retailing (the buyer’s inability to try a product before purchase), interactive technologies, like the one mentioned above, enable Internet retailers to effectively compete against large, incumbent bricks-and-mortar retailers. Such technologies also allow Internet retailers to change the basis of competition to better match their distinctive resources. In the Frames Direct example, the nature of competition switches from consumers being able to physically try, albeit a limited choice set of frames, to being able to virtually try a much larger choice set. The Internet and interactive technologies enable Internet retailers to offer a considerably larger choice set in terms of price points, brand names, and frame design (round, rectangular, oval, square, rimless, etc.) as a basis for achieving a differentiation advantage vis-à-vis bricks-and-mortar retailers.

Indirect effect of interactive technology on retail strategy — proactive merchandising and targeted advertising based on facial tracking (link A → B1 → C)

Facial tracking technology is an IT resource that providers of media/creative services to retailers, such as advertising agencies, can leverage to dramatically alter how retailers compete in the marketplace. The act of a consumer watching content appearing on a TV screen in a mall or a store triggers an unobtrusive video camera (e.g., embedded in the screen) and the tracking software determines the gender of the viewer and his/her approximate age (for details see Ramde, 2009). Based on this information, a targeted advertisement (e.g., an ad for

¹ Following Amit and Schoemaker (1993), we view resources as “stocks of available factors that are owned or controlled by the firm” (p. 35). According to this perspective, firms convert resources into goods and services by combining them with a range of other assets they own.
Impact of Interactive Technology on Retailing Strategy: A Competitiveness Enhancement Framework

A. Interactive Technology

B1. Competitiveness of the Offerings of Goods Suppliers and/or Service Providers

B2. Competitiveness of Potential Competitors of the Focal Retailer (and in turn, their Ability to Enter the Market)

B3. Competitiveness of Focal Retailer

B4. Competitiveness of Present Competitor(s) of the Focal Retailer

B5. Bargaining Power of Present and Potential Customers of the Focal Retailer

C. Implications for Changes in Retailing Strategy

- Business Model
- Customer Mix: Markets and market segments to serve
  - Retailing Mix
    - Positioning
    - Distribution channels (e.g., single versus multi-channel)
    - Product (e.g., merchandise assortment)
    - Price (e.g., price points)
    - Promotion
    - Atmospheres
  - Customer-focused Retailing Programs Directed Toward:
    - Acquisition of new customers
    - Retention of present customers
    - Enhancement of customers’ experiences

D1. Organizational Characteristics
- Size
- Skills and resources
- Motivation to respond

D2. Environmental Characteristics

Effect On:

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1 Link A → B1 → C: Deployment of a new interactive technology enhances the competitiveness of an upstream supplier of goods to the focal retailer, and in turn necessitates changes in the current strategy of the focal retailer. The appropriate strategic response (response conducive to achieving superior performance) is contingent upon certain organizational characteristics (D1) and environmental characteristics (D2). Similar explanation applies to the other links (A → B2 → C; A → B3 → C; A → B4 → C; and A → B5 → C).

2 The potential impact of new interactive technologies on the effectiveness of the focal retailer’s current strategy and warranted changes in strategy. Constituent dimensions of retail strategy shown are intended to be representative and are not comprehensive.

3 While enhancement of customers’ experiences can positively impact on acquisition and retention of customers, its purpose is not limited to customer acquisition and retention.

Fig. 1. Impact of interactive technology on retailing strategy: a competitiveness enhancement framework.
cosmetics if the viewer is determined to be an adult female; razor if the viewer is determined to be an adult male; a videogame if the viewer is determined to be a teenager) is delivered to the screen. According to the manufacturers of the system, the current level of accuracy in regard to determination of the viewer’s gender is between 80 and 85%. The potential of this interactive, yet unobtrusive, technology (the mere act of a person looking at a TV screen triggers a response based on determination of the viewer’s gender and age) includes possibilities such as targeted ads based on determination of the demographics of a group of consumers walking in front of the screen (e.g., an ad for a minivan, if the group’s composition is determined to be a man, woman and children). With the effective exploitation of this technology, retailers can more effectively target consumers who are already in a retail mall, thereby causing a potential shift in the retailer’s strategic focus away from a more passive and traditional advertising media toward a more proactive and targeted in-store/near store advertising.

**Indirect effect of interactive technology on retail strategy — internet and mobile device enabled anytime and anywhere information search capability of customers (link A → B5 → C)**

Until recently, while shopping at a retail store, it was difficult for customers to engage in online comparison of the prices, product features, and other aspects of competitors’ offerings. Furthermore, it was in the best interest of bricks-and-mortar retailers to constrain or limit the ability of shoppers inside their stores from engaging in online comparison of competing offerings via the Internet. However, the advent of third party interactive technologies is making it increasingly easier for customers to compare prices and research products with the aid of mobile devices. While inside a store, with the aid of an application (software) downloaded into a mobile device, it is now possible for customers within the premises of a physical store to scan a product’s barcode (with the aid of a camera built into the mobile device) and obtain information about prices at which the product can be purchased from other retailers — both offline and online (for a detailed discussion of advantages and disadvantages of mobile price check applications, see Fowler and Kane 2009).

The ability of customers to engage in comparison shopping from anywhere and at anytime with the aid of interactive technology enabled mobile devices, is both a threat and an opportunity for retailers. The interactive technology, by providing instant access to relevant information diminishes the information asymmetry between the seller and the buyer. It enables customers to negotiate for a better price or walk away from a retail outlet at which a product is priced higher relative to its competitors. A growing number of customers engaging in comparison shopping with the aid of interactive technology enabled mobile devices will pose a real threat to the viability of retailers who are at a competitive cost disadvantage (due to smaller scale of operation and higher overhead costs) and as a consequence constrained in their ability to compete on the price dimension. However, interactive technology enabled mobile devices that enable customers to engage in comparison shopping from anywhere present as an opportunity to prescient retailers. For instance, retailers whose business models are predicated on a low price strategy, by facilitating the diffusion and use of such technology can achieve a competitive advantage in the marketplace.

In summary, interactive technologies can have both direct and indirect effects on retailers’ strategies. An interactive technology that enables a retailer to compete more effectively in the marketplace (such as more effectively targeting consumers with facial tracking technology), can have a profound effect on its competitiveness. Moreover, interactive technologies can alter industry dynamics and allow smaller firms to successfully compete with larger incumbent players.

**Discussion**

Porter and Millar (1985) noted that information technology (IT) can affect competition in three major ways: (1) by changing industry structure, and as a consequence, altering the rules of competition; (2) creating competitive advantage by offering firms new ways to outperform their rivals; and (3) spawning new business models, often from within a firm’s existing operations. With specific reference to retailing, the impact of the Internet (an IT-based interactive technology/interactive IT) is evident in respect of all of the above mechanisms. Interestingly, Carr (2003), in an article titled, “IT Doesn’t Matter,” contended that the strategic importance of IT had diminished as a consequence of its ubiquity. He noted that scarcity, rather than ubiquity, is critical in order for a resource to be truly strategic (i.e. a basis for a firm to achieve a sustained competitive advantage). Carr distinguishes between *infrastructural technologies* (or generic technologies) and *proprietary technologies* and notes that IT evidences all the hallmarks of the former. To the extent Carr’s cautionary note applies to various interactive technologies with the potential for deployment in a retailing context, investing in generic interactive technologies is essentially a competitive imperative for retailers. That is, investing in generic interactive technologies is a cost of doing business that all competitors must incur in order to be able to effectively compete in the marketplace and not a potential source of competitive advantage for any retailer. However, even when an interactive technology is not proprietary to a firm (i.e., a technology developed by vendors that can be acquired and deployed by all competitors in an industry), a retailer with superior insights into the potential of a new interactive technology (relative to its competitors) and/or complementary resources may be able to effectively leverage the fullest potential of a generic technology, and thereby achieve a competitive advantage.

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2 Carr uses the term “infrastructural” to refer to generic technologies that are used by all firms. However, since the term infrastructure technologies is commonly used to refer to firm-wide technologies, such as ERP systems, that can be a basis for competitive advantage, we use the term generic technologies to refer to technologies that are widely available, such as off-the-shelf software and hardware.
While it may be meaningful to view the Internet as a generic infrastructure technology in the context of the current business environment, proprietary Internet-enabled interactive technologies, such as Taobao’s IM tool and FramesDirect’s patented FrameFinder Virtual Try-On™ System, shed insights into the mechanisms through which retailers can leverage a generic infrastructure technology to achieve a competitive advantage in the marketplace. Such technologies, by enhancing the effectiveness of the competitive strategy of a retailer, provide opportunities for rent appropriation, even if it were to subsequently become ubiquitous. For example, even if Taobao’s IM technology is ultimately replicated by competitors, the critical mass of buyers and sellers that already transact in its marketplace is unlikely to be replicated by competitors due to network externalities. Also, while FramesDirect’s patent will eventually expire, the base of loyal customers is unlikely to be replicated, which can enable the retailer to invest in other proprietary applications. Therefore, there are several possibilities for retailers to develop proprietary interactive technologies that build on generic interactive technologies, and thereby achieve a sustainable competitive advantage.

Accordingly, complacency on the part of a retailer and a misleading belief that all interactive technologies are essentially generic technologies with little potential to provide competitive advantage may be fraught with risk. Varadarajan and Yadav (2002) highlight the importance of developing and nurturing two firm-specific skills and resources in the context of competing in an Internet-enabled market environment:

- **Information acquisition skills and information resources** — the ability of a firm to create information resources by capturing and accumulating information relating to search behavior and purchase behavior of customers. Interactive technologies play a critical role in the accumulation of such information resources.
- **Information processing skills and information technology resources** — the ability of the firm to use IT resources to analyze its information resources to gain insights about customers and effectively use this knowledge to personalize its future interactions with these customers and customize its offerings to them.

A firm’s skills and resources in the above two areas tend to be strategy enablers in that they determine its ability (or lack thereof) to pursue specific competitive strategies in an Internet-enabled market environment. For instance, a firm’s ability to engage in suggestive selling (i.e., recommending products to a customer based on perceived similarity of their purchase patterns with those of other customers, such as Amazon’s and Netflix’s recommendation systems) depends on its information resources and information processing skills and resources. Similarly, in the area of pricing, a firm’s information resources and information processing skills determine the extent to which it would be able to engage in more fine-tuned price discrimination (e.g., inferring buyers’ price sensitivity from their web navigation and purchase behavior and offering products at prices customized to the level of individual buyers).

A firm’s IT resources are also a critical determinant of its ability to pursue other competitive strategies in the realm of pricing, such as dynamic pricing (e.g., changing the price at which a product is offered on the basis of prevailing supply and demand conditions). Kaplan, Roberts, and Sikes (2008) highlight the potential impact of the IT capabilities of firms on their performance that arise from the incorporation of customer insights in their pricing strategies (e.g., reducing revenue leakage due to unnecessary price discounting). Therefore, complementing either generic or proprietary generic technologies with the retailer’s existing resources can engender complementary resource endowments that are unlikely to be replicated by the competition and can be a basis for competitive advantage.

**Future Research Directions**

While the proposed conceptual framework (Fig. 1) provides insights into various paths through which an interactive technology can impact retailing strategy, there are several opportunities for further refinements. In this section, we briefly discuss directions for further conceptual refinement and empirical research in this rapidly evolving area.

1. **A more fine-grained view of the effect of interactive technologies on retailer’s strategies:** In the proposed conceptual framework (Fig. 1), interactive technology is viewed as enabling retailers or other entities in the retailing ecosystem. However, some retailers may view a particular emerging interactive technology as an enabler (a tool for more effectively competing in the marketplace) and by other retailers as a disruptor of the present ways of doing business. What makes a retailer view a specific interactive technology as an enabler or disrupter? Prior research sheds light on firm specific factors that can result in these differing perspectives. For instance, complementary assets (Tripsas 1997a), external integrative capacity (Tripsas 1997b), absorptive capacity (Tripsas 1997b), related market-based assets (Mitchell 1992) and technological opportunism (Srinivasan, Lilien, and Rangaswamy 2002) have been found to play an important role in the adoption of new technologies. Despite the advances made, some questions still remain unanswered. Specifically, there is a need for research that addresses the following issues and questions with regard to interactive technologies:

   a. **Day (1994) distinguishes between three broad types of capabilities, outside — in capabilities, inside — out capabilities and spanning capabilities.** Research is needed to examine how interactive technologies enhance any of these three capabilities of retailers, and the roles of different classes of capabilities in the successful implementation and leveraging of interactive technologies.

   b. **When does an interactive technology enhance the core capabilities of retailers, and when does it enhance its complementary (or peripheral) capabilities?**
c. Do interactive technologies, capabilities of retailers, and industry characteristics co-evolve? If so, what are the potential trajectories for their co-evolution?

2. **Asymmetries in advantages to firm adoption of interactive technologies:** There is a rich stream of research that examines who introduces more radical innovations — incumbents or nonincumbents (e.g., Chandy and Tellis 2000). Two schools of thought are dominant in this literature. One school of thought maintains that reasons such as technological inertia allow nonincumbents to introduce more radical innovations, while the opposing school of thought maintains that incumbents possess resource advantages that allow them to introduce more radical innovations (see Chandy and Tellis 1998; 2000 for a discussion on the relationship between firm type, firm size and radical innovation). Other research on technology change highlights scenarios where incumbents are quick to adopt a new technology. For instance, incumbent firms adopt a new technology if innovations are linked to the current value network (Christensen and Rosenbloom 1995) and when core products are at risk or when supporting assets exist (Mitchell 1989). Building on these insights, research that examines the following questions in specific reference to interactive technologies, firm type (incumbent retailers vs. nonincumbents) and retailing strategy can be undertaken:

a. Who adopts emerging interactive technologies first? Incumbent retailers or nonincumbents? Are there asymmetries in advantages to retailer adoption of interactive technologies based on whether the retailer is an incumbent or a new venture? Do interactive technology characteristics and other characteristics of the retailer moderate this relationship?

b. Do newcomers to retailing (both online and offline) put interactive technologies to more innovative uses? Are new entrants to retailing more likely to integrate interactive technologies as a core capability compared to incumbents?

c. Are retailers likely to embrace new technologies on their own or does the impetus come from their suppliers?

d. Under what conditions are new entrants into the retailing industry likely to exhibit greater involvement with an emerging interactive technology? Are these conditions any different from those under which incumbent retailers show greater propensity to adopt an emerging interactive technology?

3. **Demand side evolution of interactive technologies:** Research on disruptive technologies suggests that initially, disruptive technologies “introduce different set of features and performance attributes relative to the existing products and is offered at a lower price; a combination that is unattractive to mainstream customer value” (Govindarajan and Kopalle 2006, p. 198). This idea explicitly puts the focus on customer heterogeneity as a driver of technology evolution and highlights the need for research focusing on demand side changes. However, a review of literature on technology change suggests that the effect of demand environment on the development and evolution of technology is relatively underexplored (Malerba et al. 1999 and Adner 2002 are examples of notable exceptions). Hence, there is a need for research examining the following questions with respect to interactive technologies:

a. How do changes in customers’ characteristics drive the adoption and development of new interactive technologies by retailers and customers?

b. What specific customer-related factors should retailers take into account while implementing an interactive technology?

c. Under what conditions are interactive technologies likely to be more (or less) quickly adopted by customers?

4. **Investments in interactive technologies and financial performance:** The litmus test for any interactive technology, whether a cost-reducer or a demand-enhancer, is its potential impact on the financial performance of the retailer. There is a rich stream of research on how IT affects the performance of firms, in general (e.g., Bharadwaj, Bharadwaj, and Konsynski 1999). However, to the best of our knowledge, past research has not examined whether and how investments in interactive technologies improve the financial performance of retailers. Given the rising popularity of interactive technologies, coupled with the well-publicized failure of many online retailing initiatives during the dot-com meltdown in early 2000, there is a need for research focusing on the following questions in the context of the effect of interactive technologies on the performance of retailers:

a. Do financial markets respond favorably to the adoption of interactive technologies by retailers? If so, when is the response more favorable?

b. What is the relationship between investments in interactive technologies and firm performance? What contingencies moderate the presumably positive relationship between investments and performance?

c. How do the characteristics of the interactive technology (e.g., new to firm vs. new to world) impact the financial market’s evaluation of adoption of interactive technologies?

5. **The next era of technological ferment:** Anderson and Tushman (1990) model technology change as cycles which begin with disruptive technology followed by an era of ferment during which firms engage in intense competition for the next dominant design. Once the dominant design emerges, an era of incremental change ensues. Consider, for instance, MMORPG (Massively Multiplayer Online Role-Playing Games) which has the potential to be a disruptive technology that ushers in a new era of technological ferment. MMORPG is generating considerable interest, although its long-term prospects remain uncertain. Second Life, one of
the more predominant MMORPG currently available, has received attention in light of the unique transformational effects. For instance, Second Life allows handicapped individuals to live a virtual life where they are handicap free. It also serves as a richer medium for people to meet each other, interact and develop meaningful relationships without limitations of geographical boundaries. In fact, there are documented cases where virtual life individuals have gone on to establish real-life relationships. MMORPG is also attracting attention in the business world, and many firms have experimented with a virtual presence. Some firms view the virtual world as a medium to gain valuable consumer feedback and test new products, while others view the virtual world as their primary business domain. Still other firms are developing business models that incorporate both virtual and physical business environments. Given the growing prominence of MMORPG and its potential disruptive effects on current business models, there is need for research examining the following questions:

a. How do (how can) retailing firms leverage MMORPG to build brands, test new products and increase customer interaction with the firm?

b. Can (does) MMORPG change customers’ characteristics and how they perceive and view products?

c. Can (does) MMORPG reduce barriers to entry and allow new entrants to compete against incumbent retailers?

**Conclusion**

Retailers, during good times and bad times, have learned that the key to long-term survival and success is finding a way to continually stay differentiated from their competitors. This differentiation is typically focused in the areas of price, selection, convenience, customer service, and/or the shopping experience. As shown in this paper, the history of retailers adopting various technologies, both generic and proprietary, to achieve a competitive differentiation advantage spans several decades. However, the enabling and disruptive effects of recent technological advances on retailing strategy, especially advances in the realm of interactive technologies, are dramatic, lacking historic parallels. Such being the case, retailers who remain focused on (or are sidetracked by) traditional operational concerns, and fail to stay abreast of developments in interactive technologies and their potential impact on retailing, will be at peril. Such a course leaves them vulnerable to new competitors that may design much of their business model around the new interactive technology or, at a minimum, use it to offer customers a better shopping experience and/or to better satisfy customers’ needs. In a number of industries, it is commonplace for a Chief Technology Officer (CTO) of Chief Information Office (CIO) to be assigned the responsibility for monitoring and evaluating new information technologies. Along similar lines, retailers may consider creating a senior level position and/or a dedicated department in their IT function (if they have not already done so), with primary responsibility for monitoring and evaluating new interactive technologies and their potential impact on the competitive strategy of retailers and/or other firms (e.g., suppliers of goods and providers of services to retailers). Since interactive technologies are essentially IT-based technologies, greater involvement of the CIO or CTO as a member of the top management team (the CEO and executives directly reporting to the CEO) that is responsible for identifying, selecting, and implementing new interactive technologies, both generic and proprietary, is a competitive imperative. In the absence of a greater focus on interactive technologies and their opportunities and risks, achieving a competitive differentiation advantage in today’s intensely competitive and turbulent retail marketplace may be elusive.

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