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Choice in Interactive Environments

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Abstract

In the early 21st century, firms are thinking seriously and practically about an interactive marketing paradigm—one that integrates mass scale with individual responsiveness. The focus of this paper is on how this interactive environment is changing the customer decision-making process. With the increased amount of information available, the existence of sophisticated decision aids such as intelligent agents, and more latitude in how to interact beyond the basic desktop and laptop computers (e.g., personal digital assistants, cellular phones, tablet computers), customers have more choices than ever about how, when, and how much to interact with companies and each other. In this paper, we attempt to cover a few of the major areas of research on how customers make decisions in these environments.

Keywords: consumer decision-making, interactive environments

Introduction

Throughout its history, marketing has embraced the notion of "interactivity": it has sought to manage conversational relationships with customers for as long as there have been sales forces and postal services. Marketers have long espoused the rhetoric of interactivity, of listening to and responding to the voice of the customer. Nevertheless, the dominant model in marketing since its inception as a formal business discipline has been mass broadcast, not interactive. The reach of broadcast-associated methods has been so wide, the cost per contact so low, and the control of content so precise that interactive methods have been applied only in situations where customers have very high value, such as some industrial marketing contexts or at the point-of-purchase.

All of this is changing: during the 1990s, technological advances on a number of fronts (most notably low cost digital data storage, high speed data analysis, and inexpensive network-based interactive communications) suggest that the cost disadvantage of interactive methods relative to broadcast methods is lessening. In the early 21st century, firms are thinking seriously and practically about an interactive marketing paradigm—one that integrates mass scale with individual responsiveness. The rapid growth of the Internet as a medium for communications, as a channel of distribution, and as a way of reaching individual customers efficiently and effectively has not only affected marketing managers' decision-making but has created the need for new directions in marketing thought.

The focus of this paper is on how this new interactive environment is changing how customers make decisions. With the increased amount of information available, the existence of sophisticated decision aids such as intelligent agents, and more latitude in how to interact beyond the basic desktop and laptop computers (e.g., personal digital assistants, cellular phones, tablet computers), customers have more choices than ever about how, when, and how much to interact with companies and each other. In this paper, we attempt to cover a few of the major areas of research on how customers make decisions in this new environment.

Overview

How do interactive environments affect customer decision-making today? We list a few implications below:

1. Since pure Web companies are less common today than during the Web boom of the late 1990s-early 2000s, companies are often using their websites as part of a multi-channel strategy where websites supplement and sometimes complement bricks-and-mortar stores. Thus, customers have to decide how to use the interactive environment: Is it an information source? Is it for customer service? Is it to make a transaction? Since most customers use it for the first two reasons, Web sales figures understate the impact of the web on firm sales.
2. The availability of an abundance of information is both a blessing and a curse. It is obviously clear that more information has the potential for customers to make more informed choices as well as to make price and quality comparisons more efficient.

The downside is that information overload can lead to decision biases due to selective processing of the information.
3. The Web offers opportunities to customers to not only seek information but product recommendations as well. Some of these, like Amazon.com's music and book recommendation system, are relatively unsophisticated and rely exclusively on prior purchases. Others are real-time and goal-directed.
4. There is a much greater opportunity for product and service customization through interactive environments. A visit to Nike.com, for example, shows how a customer can design a running shoe by inputting a number of personalized parameters, including where s/he would like the Nike trademark swoosh to be.
5. Content can easily be personalized on the Web. At My.Yahoo.com, the user can personalize news, weather, sports, stock price information, and many other information topics. Some shopping sites permit a customer to design his or her own site depending upon product preferences.

Based on these characteristics of interactive environments, this paper will address three key areas of research:

1. Do consumers want interactive environments? If so, under what conditions?
2. What effects do interactive environments have on consumer behavior?
3. What special challenges do these effects present for management?

Do Consumers Want Interactive Environments?

As we noted above, recent advances in communication and manufacturing technology allow for increasingly individualized interactions between firms and customers in different stages of the supply chain (e.g., manufacturers) and using different media and retail channels. A number of different stages in the exchange process for personalized value creation can be distinguished (e.g., Murthi and Sarkar, 2003; Riaboukhina et al., 2004):

1. For a given usage situation, consumers share personal information with a supply chain (e.g., lifestyle information, attitude ratings, zip code, preferences). Consumers provide this information using an interface that subsumes a certain format in which the information is exchanged. This can be physical (in store, market research survey, in home testing) as well as digital (electronic questionnaires, electronic ratings, etc) or a combination of both.
2. The supply chain employs technology to transform the personal information into a personalized solution. Typically, this will involve using a mix of flexible manufacturing and information technology tools. Using this technology, the supply chain designs or selects a personal solution for the particular client most often based on a mixture of personal and market level information.
3. Subsequently, the product or service is provided to the consumer using a certain (second) user interface (e.g., send products home, give email advice, etc.).

4. The consumer uses the product or service.
5. The consumer evaluates the added value of the product or services, and when desired, communicates with the supply chain about further interactions.

Little research to date has addressed the question of how consumers evaluate and choose such complex (typically information technology-oriented) consumer-firm interaction mechanisms. Two potentially relevant areas of research that have begun to address related questions are the literature on information technology adoption in organizations (e.g. Davis et al., 1989) and self-service technology acceptance (e.g., Dabholkar and Bagozzi, 2002). Scholars working in these areas have developed models that define key beliefs that individuals hold about a technology and that determine whether or not they will adopt this technology. Such models may represent promising approaches to understand consumer participation in individualized consumer-firm interactions, since such interactions typically also rely strongly on information technology tools.

This earlier research, however, does not address several crucial characteristics of consumer-firm interactions, in particular the highly complex multi-stage, multi-channel nature of such interactions. Therefore, new research models are also needed. For example, consumers' intentions to use self-service technology typically is studied in the context of a single replacement of conventional service mechanisms.

In the context of interactive processes, however, consumers may use multiple channels (e.g., the Internet, retail outlets, and call services) to achieve multiple objectives such as acquiring information about a product, defining its characteristics, placing the order and obtaining the manufactured product. Decisions regarding such complex interactions imply 'basket' or 'menu' choices that consumers need to make about the different aspects of interacting with the supply chain. For example, consumers may or may not like to use some channels in combination with others. It would be worthwhile to understand how consumers simplify the large number of options and combinations they face when choosing how to interact with firms, focusing for example on questions like 'Do consumers choose their interactions strictly sequentially from one period to the other, or do they optimize over multiple periods?'

For all these reasons, desire for interactivity should not be taken as a given. Because of the requirements that the customer release information about him or herself in order to benefit from the interactive environment, privacy concerns will be (and are today) an issue. The customer asks: What will be done with the information? In addition, the customer will perform an intuitive cost-benefit analysis: Is the information I am releasing going to be worth it in terms of the benefits of customization, personalization, etc.? We need to be able to answer this question more precisely in the future, that is, exactly what tradeoffs are customers willing to make?

Effects of Interactive Environments on Consumer Behavior/Choice

If the study of consumer behavior and choice has shown anything over the years, it is that behavior and choice are context dependent (Tversky and Simonson, 1993). The novelty of

the Internet provides a new environment for study of consumer choice in that context or in contexts that have some of its more salient characteristics. Two of these characteristics are information abundance and face-to-face anonymity.

As we have noted previously, the Internet makes it easier for consumers to obtain a huge amount of information on different choice alternatives (e.g., products, brands, stores). The original thinking was that this abundance of information would allow consumers to conduct a much broader information search. However, the early research has suggested just the opposite.

Indeed, much like the earlier work by Newman and Staelin (1972) on automobile and durable information-seeking behavior, consumers appear to be "locked-in," that is, they search much less than expected. Zauberman's (2003) laboratory experiments produced high levels of site "lock-in" for subjects given search tasks on the Internet. Johnson et al. (2003) applied the power law of practice and found cognitive lock-in for almost all of the websites they analyzed. Johnson et al. (2004) reported low levels of search in several categories (1.2 book sites searched on average, 1.3 sites for CD's, and 1.8 sites for travel). In studying one e-commerce site, Moe (2003) found that less than ten percent of the population engaged in directed or deliberate search. A behavioral explanation of this phenomenon is provided by Murray and Häubl (2003) where the authors demonstrate that consumer loyalty to particular interfaces or stores is driven more by the acquisition of non-transferable user skills at a site rather than the acquisition of general skills for using an interface.

Bucklin et al. (2004) studied consumer search patterns for automobiles. Automobiles is a convenient category to study with respect to search because there is a literature that can be used as a basis for comparison (e.g., Hauser et al., 1993; Ratchford et al., 2004). Bucklin et al. (2004) studied ComScore Media Metrix data for 150,000 panelists across 152 websites. They found that panelists employed between two and three (on-line) information sources. Furthermore, Ratchford et al., observed that only 40 percent of their sample used the Internet. It appears then that, unless the ComScore panel was doing a lot more off-line information search, the Internet has not really expanded the scope of information search. This will be difficult to ferret out until data sets combine on- and off-line information sources. Any investigation into the possibility of systematic ordering to the search that people do in a world with on-line capability is hampered by the same problem.

It is easy to see why the Internet might not expand the scope of information search. Comparing alternatives on prices, product features, and quality ratings can be overwhelming. Indeed, some studies have shown that abundant information can lead not only to the well-known result of sub-optimal choices (cf. Jacoby et al., 1974) but also choice deferrals (Dhar and Nowlis, 1999).

As consumers are faced with the task of processing this abundance of information, the comparisons they will be making are likely to be mixed, that is, some will favor one alternative and others will favor another. Meyvis and Cooke (2004) asked what the net effect of such an assortment of mixed comparisons is. They show consumers tend to focus on the unfavorable comparisons when they are using the comparative information to inform future choices.

In a simulated shopping experiment, subjects were asked to pick a store for which they would receive comparative price information. They were then shown the prices of 36

items at this store (one at a time) along with the prices at two other competitive stores, much as would be the case with a shopping robot that automatically searches a large number of stores for a specific product (i.e., a shopbot). In the authors' first experiment, the "stores" had identical mean prices. Therefore, the numbers of positive and negative comparisons to the chosen store were in balance. When using the shopbot information to inform a future store choice, subjects perceived their chosen store as more expensive than its competitors.

A second experiment showed the strength of this effect by making the chosen store cheaper than the other two stores. Less than half of the subjects in this second experiment chose to remain with their original store when given the option to switch. Subjects selectively screened the comparative information for ways to improve their store choices leading to an overly negative perception of their chosen option. Mixed comparisons in the face of abundant information thus have the potential to hurt the image of a chosen option and perhaps increase the likelihood of brand/store switching.

The lack of face-to-face interaction on the Internet raises several questions. One in particular is whether this environment induces participants to act more or less ethically. Ambiguity and anonymity encourages unethical behavior. Individuals have been shown to be antisocial and uninhibited online (Kiesler and Sproull, 1992). Some have described online dating as a process of "determining degrees of lying" in a potential partner. The lack of direct face-to-face communication makes it difficult to cultivate trust and interpret signals. In online reverse auctions, suppliers believe that buyers are acting unethically, when, in fact, buyers are acting ethically (Jap, 2003). On the other hand, on-line communication leaves a paper trail, which implies that individuals can be held accountable.

Ongoing research by Jap (2004) is addressing the following questions. How does the choice to act ethically online or offline change as (a) the decision maker's personal stakes are raised?, and (b) there exists an ongoing relationship with the decision maker? Generally, off-line managers are more unethical as their personal stakes increase (Mitchell and Mickel, 1999) and relationships should inhibit unethical behavior (Ross and Robertson, 2000). Whether these propositions extend to on-line environments remains to be seen. Qualitative interviews, surveys, and content analyses of chat rooms are all useful tools for answering these questions.

Implications for Consumers and Managers

The novelty of the Internet has led many to incorrectly conclude that new techniques and methods must be developed to take advantage of this technology. Methods used in promotion, pricing, forecasting, and control in marketing research for the past 30 years have been or could be applied to the Internet. For example, as Montgomery (2004) points out, the basic problem of structuring an agent to present the consumer with a set of alternatives from which s/he will make a decision is analogous to the problems of structuring a consumer's consideration set (cf. Roberts and Lattin, 1991) or a consumer's assortment (cf. Harlam and Lodish, 1995). All cases involve a selection of multiple items (or pages) where the arrangement impacts choice.

Likewise, as in the "offline" world, the problem for managers is not a shortage of models. It is a shortage of appropriate data. To apply models such as the logit and probit, managers need sets of relevant independent variables. The relevant independent variables need to be identified and corresponding data capture technologies need to be developed. One advantage the Internet presents in this area relates to display. In analyzing typical retail environments using scanner data, we never know the exact shelf design. With the Internet we have the potential to know it precisely. The Internet also provides information regarding the order in which products are put into a shopping basket and the content of abandoned shopping carts.

Ultimately, we hope that the participants in consumer transactions (i.e., customers and marketers) will find research on interactive contexts and the related consumer behavior useful in their respective endeavors. We discuss below several areas of research on topics relevant for managers. One question is whether information can be structured for consumers through the design of personalized decision tools such as comparison matrices and intelligent agents such as shopbots in a useful manner (Häubl et al., 2004). An additional question is how a marketer could design websites that truly personalize product recommendations and how consumers react to these versus more neutral, "third party" web sites such as www.kbb.com for automobiles. Similarly, it is worthwhile to investigate how consumers can best be supported in cases where manufacturers allow them to (mass) customize their own products (Dellaert and Stremersch, 2005; Huffman and Kahn, 1998). Finally, we address the issue of the structure of one new tool (i.e., e-mail) that can help marketers be more efficient in testing direct marketing efforts.

From a marketing perspective it becomes important to manage the purchase decision process. Unlike typical retail situations where information search, attitude formation, purchase decisions, and service often occur in different places at different times, the website is a portal through which many of these activities occur. Recent research highlights the importance of the management of this portal. In their study of an automobile retail website, Sismeiro and Bucklin (2004) found that consumers' use of an attribute comparison matrix called a "comparator" to search for information was actually associated with a lower probability of completing a complete car configuration and consequently purchasing.

In contrast, laboratory experiments conducted by Trifts and Häubl (2003) demonstrate that when an on-line retailer offers completely uncensored comparative competitor price information, consumer preference for that retailer increases. This effect is moderated by how attractive the retailer's prices are, and it is mediated by the perceived trustworthiness of the retailer. Furthermore, work by Häubl and Trifts (2000) showed that a comparison matrix similar to the comparator produced higher quality consideration sets and decisions. Sismeiro and Bucklin do point out that the comparator used in their study (a corporate website) may not have been well-designed. This might account for some of the discrepancy. Nevertheless, the possibility remains that providing information could postpone or even prevent purchase. Managers clearly want to avoid this possibility. Furthermore, the comparator presents a lot more information than simply price comparisons. Indeed, the findings of Trifts and Häubl (2003) and Sismeiro and Bucklin (2004) can be reconciled if providing a little information is a good thing, but providing too much can be a bad thing.

Beyond devices like the comparator, much commercial attention has been focused on the development of agents. Agents are not new; a crude (by today's standards) agent, Firefly, was developed in the mid-1990s for movie and music recommendations. At an earlier Choice Symposium, West et al. (1999) developed a set of roles that agents could potentially perform for consumers. However, since the late 1990s, the amount of information available on the Web has increased dramatically as has the technological sophistication of the agents which makes continued research in this area important.

Overall, research has demonstrated that intelligent agents help consumers. In particular, Haübl and Trifts (2000) show that recommender agents based on self-explicated information about a consumer's utility function (i.e., attribute weights and minimum acceptable attribute levels) reduce search effort and improve decisions. Montgomery (2004) presented a set of qualities that intelligent agents should possess, updating recommendations made by West et al. (1999). Agents should be adaptive, autonomous, and believable, be able to respond in a timely fashion, and be goal-oriented. The last quality raises a question about agents. For whom does the agent "work"? Is it the buyer or the seller? On the face of it, the agent works for the buyer. However, this does not preclude the possibility that the agent could propose an alternative or set of alternatives that favors the seller as well (i.e., the goal could be quite complex). Research by Häubl and Murray (2003) has shown that, all else being equal, the inclusion of an attribute in a recommendation agent renders this attribute more prominent in consumers' purchase decisions. Vendors have the potential to then influence buyers by constructing "agents" that are based heavily on attributes on which the vendor performs well.

It has also been established that agents, like those studied by Häubl and his colleagues, that learn about consumers from choices and consumer preferences perform better in the long run than (say) collaborative filters (Ariely et al., 2004). This suggests that methods that calibrate consumer preferences in real time on-line are crucial to advancement. Liechty et al. (2004) outline a series of criteria that such methods should satisfy. Such methods should be interactive, adaptive, focused/brief, able to work in real time, able to share information across customers, able to store past purchases in memory, and able to generate consumer confidence. For the most part, polyhedral conjoint analysis (Toubia et al., 2003) satisfies these criteria. Liechty and his colleagues developed a Hierarchical Bayes procedure that does so as well.

Montgomery et al. (2004) address the problem of designing a better shopbot. Computer scientists have designed most shopbots. Montgomery and his colleagues bring a consumer decision-making perspective to the problem. They develop an analytical model of consumer utility to compare the expected gains of search against the expected losses. The gains include higher utility from identifying lower prices or faster delivery; costs include the waiting time for the shopbot to respond and the cognitive effort required to compare alternatives. They show that shopbots are inferior to visiting a favorite retailer if the shopbot visits all retailers. If, on the other hand, the shopbot anticipates the benefits to the consumer of where to search, it can do quite well.

However, just as with almost any marketing instrument, shopbots and websites in general are not of the "one size fits all" category. Montgomery and Srinivasan (2003) suggest that the Internet provides managers with incredible opportunities to learn about their customers.

Indeed, learning can take both passive and active forms. Passive learning occurs when managers (through a very sophisticated information system) make inferences from revealed behavior. For example, Zhu et al. (2003a,b) have developed unobtrusive technologies for real-time interface personalization based entirely on observable user behavior. Active learning occurs when managers ask the consumer directly for relevant information. This can occur through log-ons, surveys, forms, and shipping information. Each approach has its shortcomings. Passive learning may tell us what, but not why. Active learning may suffer from guessing, consumers being unwilling to reveal information, and that it ignores what consumers have revealed in their interactions. Indeed, combining both active and passive learning methods has potential. The procedures of Liechty and his colleagues follow this approach.

The promise that such approaches bring is the ability to design consumer websites adaptively. Indeed, armed with some inferences from previous visits, a small set of initial screener questions can lead to an optimally personalized web interface for the consumer. Such an interface would both be more useful to the consumer and lead to greater productivity for the company. However, such a process is also time-consuming, provokes privacy fears, and needs to be adaptive to permit changes in consumer preferences over time.

The capabilities of the Internet go beyond that of optimizing and tailoring websites for consumer use. For example, Drèze and Bonfrer (2004) have developed a model that allows for testing direct marketing e-mail campaigns in real time. Based on a stochastic duration model and Bayesian updating, the authors adapt the testing parameters (e.g., number of e-mails sent for each e-mail design and sending rate) while the testing is in progress so as to minimize the cost of testing both in terms of wasted e-mails and time. This, along with the negligible marginal cost of sending an e-mail, allows for very rapid comparative testing.

Conclusion

We have described some research indicating that the nature of the interactive environment chosen by the customer has a significant impact on the customer's behavior and decision process. The major themes are the following:

- Do customers want interactive environments? Only if the interactivity pays off.
- What effects do interactive environments have on customer behavior? With online help, they make better choices. However, the "help" is difficult to implement and companies have to get customers to use the help.
- What special challenges do these interactive environments present for management? These include developing tools for real-time personalization, and decisions about how much information to provide and about when, where, and how to involve the customer.

Based on the research reviewed in this paper, the benefits/costs of interactivity to consumers can be summarized as follows:

Benefits

- Access to more information.
- Possible improved decision-making through of agents.
- Customization of products and content.
- Improved welfare through lower prices.
- Availability of "tools" to aid the shopping/information search process.

Costs

- Greater information means the possibility of greater processing costs if "tools" are not used.
- Potential loss of privacy and security.
- In bargaining or auction situations, possible lack of trust and the inability to interpret the signals of the other participant(*s*).

Given that the costs can largely be overcome through the use of decision aids and other technological advances, we strongly feel that the net payoff of interactivity to consumers is positive.

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