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Bringing virtual reality for commercial Web sites

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Abstract

In today's competitive environment, a growing number of firms are establishing their presence in the market space. Even though the potential of the Internet in shaping business strategies has been widely acknowledged, firms in an array of industries are still struggling to attract customers through their Web sites. Based on Steuer's (J. Commun. 42(4) (1992) 73) and Rheingold' (The Virtual Community, ACM/Addison-Wesley, Reading, MA, 1993) arguments on perceptual experience in the virtual space, we present a theoretical framework that highlights the relative importance of interactivity, immersion, and connectivity for attracting customers through a Web site. Interactivity has been measured through the speed of interactivity, range of interactivity, and significance. Immersion has been measured through the breadth of immersion and depth of immersion. Connectivity has been measured through the scope of connectivity. Through an experimental study, the features of amazon.com, ebay.com, schwab.com, and victoriasecret.com have been analysed with respect to interactivity, immersion, and connectivity. We argue that in order to attract customers through their Web sites, dot-coms are required to balance a trade-off between interactivity, immersion, and connectively, depending on their business objectives.

1. Introduction

In today's competitive environments, a growing number of firms are establishing their presence in the market space (Rayport and Sviokla, 1995). It is now a commonly held view that the market space presents several opportunities as well as challenges for the firms. Firms competing in the market space, as we refer to them as dot-coms, make their products and services available globally and gain the

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advantage of customized promotional activities. At the same time, a high level of global visibility increases the competitive intensity of the dot-coms, as customers expect superior level of service from dot-coms (Palmer and Griffith, 1998; Chevalier and Ivory, 2003).

Existing research has demonstrated several reasons for building Web sites (Nielsen, 2000). First, a Web site manages customer interactions creatively (Laudon and Traver, 2002). Second, it makes it possible for a firm to advertise its products and services globally at a fraction of the cost as compared to that of traditional media advertisements (Treece and Stewart, 1998).

While traditional media advertises heavily without paying much attention on the personal characteristics of individual customers in a segment, a Web site reverses this trend, because it is the customer that deliberately searches and seeks information from a Web site (Kalakota and Whinston, 1996; Hoffman and Novak, 1997). Similarly, it is the customer that usually takes initiatives in providing feedback and other kind of information to the firm through a Web site (Hoffman and Novak, 1997). However, Internet advertising is not without its flaws. The speed of navigation, quality of information contents, importance of visual identity, and significance of community building have been found to affect the desirability of Internet advertising (Laudon and Traver, 2002, pp. 414–415; Zhang and von Dran, 2000).

Shackel (1991) has provided a comprehensive list of human factors that may affect the viability of the Web sites. Some of these factors, such as functionality, usability, suitability, performance, learning requirement, flexibility, and user satisfaction, have been found to impact users' perceptions of a Web site (Hoffman and Novak, 1997; Ghani and Deshpande, 1994). Gaines et al. (1997) extended Shackel's (1991) work by considering the impact of functionality, usability, and suitability at the social level (see also Shackel, 1997). Trevino and Webster (1992) developed a model on "suitability" in the context of computer-meditated communication. Zhang and von Dran (2000) used a two factors model for designing and evaluating Web sites. According to them, there are two types of factors: hygiene and motivator. Hygiene factors are critical for making a Web site functional and serviceable and motivator factors are important to add value to the Web site.

Besides, a considerable amount of research on HCI has used the concept of "optimum flow" in evaluating the usability of a Web site (Csikszentmihalyi and Csikszentmihalyi, 1988; Csikszentmihalyi, 1990). For example, Ghani and Deshpande (1994) argue that two concepts of flow are concentration and enjoyment. Deci and Ryan (1985) posit that there is an optimum level of challenge relative to a skill level that provides an enjoyable and attentive experience to the users (Csikszentmihalyi, 1975). The extensive research on HCI in context of computer and video games have established that people find these games so fascinating because they challenge users for using their skills to control different moves of the game that provide a sense of accomplishment and enjoyment to the users (Csikszentmihalyi, 1975; Malone and Lepper, 1987; Trevino and Webster, 1992).

Hoffman and Novak (1996) identified four properties of flow. These are characterized by interactivity, enjoyable experience, loss of self-consciousness, and

self-reinforcing. In order to remain in a state of flow, the skills and challenges be so balanced as the consumers must be paying attention, when navigating a Web site. This balance, according to Hoffman and Novak (1996), leads to enhancement in learning, participation, and exploration as well as positive experience in navigating a Web site.

While individual interactions with the latest technology, i.e. the Internet, the video game, etc., are shown to lead addiction on the part of the users (Nash, 1997), the engaging experience is also found to lead to positive attitudes toward the exploratory use of technology (Ghani and Deshpande, 1994).

The above studies have provided us a better understanding of the characteristics of technology that could engage users, make their experience enjoyable, and enhance their curiosity and learning, however, these discussions are functional in nature as the main focus of these studies is toward the usability of technology. In the study presented here, we extend the above work and focus on the issue of "likeability," i.e. what features of a Web site interest to the users.

The main aim of our study is to offer a theoretical framework to describe the features of a "sticky Web site." We validate the framework through the analysis of four sites: amazon.com, ebay.com, schwab.com, and victoriasecret.com. For this paper, we define a sticky Web site to include those features that are likely to enhance customers' perceptions of experiencing realities during their exploration of the Web site.

The research presented here does not attempt to unite technical, navigation, functional and transaction issues, as several studies have dealt with these studies (Shackel, 1991; Trevino and Webster, 1992; Gaines et al., 1997). Our main goal is to explore the characteristics of Web sites that keep customer interests. Whether customer interests conclude with a sale or not is not analysed in the research presented here. We still believe that the paper should be useful to provide a preliminary understanding of the quality of a sticky Web site, because a number of researchers argue that in order to generate a sale through the Internet a dot-com should be able to attract customers to its Web site (Treece and Stewart, 1998, pp. 16–17; Novak et al., 2000; Zhang and von Dran, 2000). Long download times, difficult navigation, and lack of useful information are some of the reasons that lead to the premature abandonment of the Web sites by the customers (Dellaert and Khan, 1999; Lohse et al., 2000).

2. Theoretical background

Our theoretical framework is based on two perspectives: First, we use Steuer's (1992) argument on perceptual experience in the virtual space. Second, we use the concept of the connectivity as used by Rheingold (1993). Steuer (1992) argues that perceptual experience in the virtual reality can be categorized along interactivity and immersion. Interactivity is measured through the peed of interactivity, range of interactivity, and significance. Immersion is measured through the breadth of immersion and depth of immersion.

Connectivity, according to Rheingold (1993), enables the emergence of virtual communities and makes participants aware of each other's expectations in the virtual space. Connectivity is measured through the scope of connectivity.

Based on Steuer's (1992) and Rheingold' (1993) arguments about the virtual space, we present a theoretical framework that highlights the relative importance of interactivity, immersion, and connectivity for attracting customers through a Web site. Below, we discuss the concepts of interactivity, immersion, and connectivity.

2.1. Interactivity

Interactivity, according to Steuer (1992), refers to the extent to which a user can affect the "form or content of the mediated environment." In other words, it is the interaction between a human and the technological system. For example, playing a video game shows the interaction between a child and the video game. Conducting a transaction through an automatic teller machine (ATM) shows the interaction between a customer and the machine (Hecker, 2000). Three factors that contribute to interactivity are speed, range, and significance.

Speed: Speed refers to the rate at which input are assimilated into the mediated environment (Steuer, 1992). A system that responds to users' interactions quicker is considered to have higher speed of interactivity. Real time response is the maximum value of interactivity that a system can take. In other words, the response time of a system can directly affect the speed of interaction between the users and the system. In this respect, a telephone system is considered higher in its speed of interaction than a computer system, because a telephone allows two or more parties to interact almost instantaneously. Similarly, a video game is considered highly interactive, as users almost instantaneously perceive and react to the actions and responses of the video game.

Range: Range of interactivity refers to the number of attributes of the mediated environment that can be manipulated and the amount of possible variations within each attribute (Steuer, 1992). The range of interactivity can vary from the manipulation of spatial dimensions of the objects to the manipulation of sound, color, and frequency. For example, a computer animation, equipped with video clips provides several possibilities of manipulation ranging from spatial features to color, sound, and frequency would be considered to have a higher range of interactivity than a TV broadcast, as a TV offers only two possibilities of manipulation: either turn on the program, or turn off the program.

Significance: Significance refers to the way the mediated environment responds to human actions. A system, which responds to users' actions more "realistically," will be considered higher on significance than a system that responds contrary to the users' expectations (Zahoric and Jenison, 1998). For example, a video game, which mimics "realistic" moves, is considered to be higher on significance than a system whose responses appear to be abnormal or contrary to the real-world actions (Trevino and Ryan, 1993).

2.2. Immersion

Immersion refers to the feeling of being deeply engaged in a virtual world as if it were the real one (Ragusa and Bochenek, 2001). Bystrom et al. (1999) emphasize the significance of human senses in defining immersion, as they argue that immersion encompasses vision, hearing, taste, smell, and touch. Steuer (1992) categorizes immersion along two measures: the breadth of immersion (i.e. the number of sensory organs that are affected by the virtual reality), and the depth of immersion (i.e. the degree of resolution).

Breadth of immersion: Breadth of immersion encompasses vividness. It refers to "the representational richness of a mediated environment as defined by its formal features; that is, the way in which an environment presents information to the senses" (Steuer, 1992). For example, a medium that can present information across human senses, such as visual, auditory, touch, and taste dimensions will be considered higher on the breadth of immersion than a system that excites fewer numbers of human senses. For example, a TV broadcast will be considered higher on breadth of immersion than a radio program, because a radio program excites only auditory sense, while a TV broadcast excites visual sense, along with auditory one. Similarly, a video game is considered higher on breadth of immersion than a cinema, because playing a video game excites visual, auditory, and tactile senses, while a cinema-show excites only visual and auditory senses

Depth of immersion: Depth of immersion refers to the quality of information available to the human senses. For example, an image with 3-D spatial features is considered higher on depth of immersion than a picture with 2-D features. Similarly, watching a film in a theatre will be considered higher on depth than watching it on the TV, because the resolution of the TV screen is lower than that of the theatre screen.

2.3. Connectivity

Connectivity refers to the awareness of the participants in a mediated environment for the presence of other human beings with whom they feel socially affiliated (Rheingold, 1993). Connectivity enables people to build virtual relationships with others and internalize their experiences and conversations (Hagel III and Armstrong, 1997). Connectivity between participants can be considered as a conduit of communication that tries to deal with individual concerns and interests (Bauwens, 1994). Connectivity is measured with the scope of connectivity.

Scope of connectivity: Scope of connectivity refers to the extent to which a participant in a mediated environment is connected to diverse groups of communities for emotional and social supports (Machrone, 1995). In this sense, a mediated environment that allows many-to-many communication facilities across virtual communities would be considered higher in scope of connectivity. For example, a group decision support system that allows people from different divisions of an organization to discuss on diverse organizational issues would be considered higher in scope than a simple one-to-one telephone system through which only two

participants can communicate at one time. Similarly a bulletin board or a virtual public forum will be considered higher in scope than a simple e-mail system between two participants.

3. Framework

We extend above arguments outlined by Steuer (1992) and Rheingold (1993). We believe that their arguments can successfully be used in case of the sticky Web sites. Because when customers experience a reality through a Web site, they are likely to be attracted to that Web site and eventually may make a sale. Below we present the concepts of interactivity, immersion, and connectivity in context of a sticky Web site.

3.1. Interactivity

An Internet browser enables customers to manipulate and customize information. However, not all of the sites allow the same level of interactivity to customers. A site that allows quick manipulation capabilities is likely to attract customers. We are already witnessing firms in array of industries that are offering customers opportunities to personalize their choices in products and services through the Web sites. Below we discuss three measures of interactivity.

Speed of interaction: Speed of interaction is important for maintaining customer interests on a site. If a Web page takes too long to load, or if it is difficult to manipulate and customize information from a Web site, customers are likely feel frustrated and may never access that Web site again (Dellaert and Khan, 1999; Lohse et al., 2000). Although speed of interaction may depend on network bandwidth and information technology sophistication, cluttering a Web page with too much information can also create traffic congestion. Moreover, in various parts of the world, a majority of people still use traditional telephone lines and modems to log on the Internet, so it becomes imperative for dot-coms that they carefully evaluate the mix of information contents into their sites.

Range of interaction: Range of interaction is especially crucial, when customers want to view unique features of a product or service. If a dot-com provides diverse means of viewing, manipulating, and customizing several features of a product through its Web site, customers are likely to feel more satisfied with their experiences (Laudon and Traver, 2002). In contrast, a Web site that is inflexible and makes it difficult for customers to manipulate company's offered products along key dimensions is likely to reduce customer satisfaction (see Hoffman and Novak, 2000).

Significance: Through significant interactions, customers do not need to learn the use of tools and techniques that are counter to their "real-life" experiences. Therefore, if a Web site offers "natural" way of customizing information, customers are likely to feel more satisfied (Raskin, 1994) (Table 1).

Table 1
Re-conceptualizing Interactivity for a sticky Web site

Factor	Results
Interactivity	Manipulation and customization of information
Speed	Quick response
Range	Ease of customization, comparisons across different sets of products and services
Significance	Use of simpler navigating tools as used in the "real world." Use of shopping cart, one-click shipping, and other intelligent tools

Table 2
Re-conceptualizing Immersion for a sticky Web site

Factor	Results
Immersion	Engagement of senses in the virtual space
Breadth of immersion	Use of multimedia environment for the Web sites, present information in a mix of text, graphics, audio, and video clips
Depth of immersion	Use of innovative software tools such as 3-D modeling software, intelligent agents, and other tools for representing information in such as way as to match customer preferences

3.2. Immersion

By creatively packaging information contents, enhanced through audio and video clips, a dot-com can enhance customers' perception of reality. For example, an e-catalog can be equipped with the images of product designs, customer reviews, and virtual tours. However, dot-coms need to carefully evaluate the mix of graphics, audio and video clips in a Web page, because graphics, audio and video clips reduce the speed of interactivity. Below we discuss two measures of interactivity:

Breadth of immersion: A Web site that impacts maximum number of senses is likely to be far more attractive to customers than a site that impacts fewer senses. However, there is a trade-off between the vividness and the speed of interactivity. Therefore, the breadth of immersion on a site should be based on the type of the industry. For example, a dot-com, competing in the fashion industry, must organize its contents such in way as to allow customers easy navigational capability to view and compare the colors, looks, and designs of various fashion apparels from different angles. On the other hand, a dot-com competing in the book industry should be less concerned about comparison of various books along color, design, or looks.

Depth of immersion: A Web site that provides a clear picture of its product and service offering is likely to enhance customer satisfaction than a site that does not show the picture of its offering. For example, a firm doing business in modeling or pornography is likely to paste the pictures of its models on its Web sites (Table 2).

Table 3
Re-conceptualizing connectivity for a sticky Web site

Factor	Results
Connectivity	Involvement with other members of the virtual communities
Scope of the connectivity	Use of bulletin boards, newsgroups, and list-serve to allow customers to post their experiences
Richness of the response	Use of e-mail, chat room, and other communication avenues to respond to customer inquiries in private

3.3. Connectivity

Connectivity between customers is an important characteristic to promote word-of-mouth advertising (Schuler, 1996). While most of information presented in a Web site is controlled and monitored by dot-coms, connectivity, however, is created by the customers. Below, we describe the measure of the connectivity.

Scope of connectivity: Scope of connectivity is characterized by a customer's ability to engage into different kinds of virtual forum. Therefore, a Web site should encourage dialogue and interactions among diverse groups of customers, by allowing them to access archives, bulletin boards, discussion lists, and news groups (Moore, 2001).

By linking a community through its Web site, a dot-com can gain advantages of efficiency and "good will," which is increasingly being seen as a sign of customer loyalty and satisfaction (Hagel III and Armstrong, 1997; Hoffman, 2000). For example, fine-art.com has successfully used a collaborative network for art works. Over 200,000 viewers use the site every month to find various kind of information on artwork (Table 3).

4. Methodology

To get a better understanding of the interactivity, immersion, and connectivity, we conducted an experimental study with 40 MBA students. In the first phase, in consultation with two doctoral students and two professors, we selected a list of 10 premier commercial Web sites, including amazon.com, boo.com, ebay.com, federalexpress.com, immigration.com, londontown.com, msn.com, newtown.school.nz, swhwab.com, and victoriasecret.com. These sites were chosen because we believed that these sites provide sufficient levels of comparison between interactivity, immersion, and connectivity. To get a better overview of three dimensions, we finally agreed to work with amazon.com, ebay.com, schwab.com, and victoriasecret.com sites, as these sites depict varieties in the levels of interactivity, immersion, and connectivity.

Next, each of the two doctoral students and each of the two professors developed a set of items measuring interactivity, immersion, and connectivity. We as a group worked together for several hours and brainstormed to come-up with different sets of items on interactivity, immersion, and connectivity. We excluded the measure on

Table 4
Means and standard deviations of sample sites

Dimensions	Features of Web sites (means and standard deviations)			
	amazon.com	ebay.com	schwab.com	victoriasecret.com
Interactivity	4.16	4.05	4.70	1.22
	0.69*	0.56*	0.46*	0.34*
Immersion	1.98	4.06	1.90	4.49
	0.65*	0.63*	0.60*	0.71*
Connectivity	2.91	3.92	2.43	1.06
	0.53*	0.58*	0.62*	0.25*

Note: The number on the top in each cell refers to the means of the site and number with a * refers to the standard deviation on corresponding dimensions of interactivity, immersion, and connectivity.

"depth of immersion" from the study, because we felt that "resolution" of an environment is more related to the quality of monitor than the Web site. We agreed to keep 6 items as shown in Appendix A, after discussing more thoroughly about each of the measures. The first two items are considered to measure interactivity, the next two items are considered to measure immersion, and the last two items are considered to measure connectivity.

In the second phase, we conducted an exploratory study with 40 MBA students. Each participant was offered free coffee and donuts, along with four points towards the participant's grade. We divided students in 4 random groups. We then handed the list of four sites: amazon.com, ebay.com, schwab.com, and victoriasecret.com, in random orders, to the groups. We asked participants to visit at each of the four sites and look for those attributes that they believed are positive and negative in affecting the attractiveness of these sites. We promised participants that they would receive two extra points toward their grades if they provide well-structured comments. Two doctoral students supervised the groups of students in the classroom and collected student comments. We asked participants for their comments, because our intention was that they take the given experiment seriously. The time limit to complete the experiment was 3 h. When participants finished the experiment, they were asked to respond to the attached questionnaire as shown in Appendix A.

4.1. Data analysis

Since our study is exploratory in nature, we compared means and standard deviation of amazon.com, ebay.com, schwab.com and victoriasecret.com on interactivity, immersion, and connectivity, as shown in Table 4.

5. Results and discussion

It is evident that for amzon.com and ebay.com, the mean values on interactivity are almost same (4.16 vs. 4.05). For schwab.com, this value is increased to (4.70),

while for victoriasecret.com, this value is (1.22). On immersion, victoriasecret.com and ebay.com have almost similar values (4.49 vs. >4.06). For amzon.com and schwab.com, these values are far lower (1.98 vs. 190). On connectivity, victoriasecret.com has the lowest value (1.06), and amazon.com and schwab.com has almost similar values (2.91 vs. 2.43), but for ebay.com the mean value is far higher (3.92).

These values on interactivity, immersion, and connectivity show that depending on their objectives, dot-coms make choices to balance between interactivity, immersion, and connectivity. In an ideal case, the values on each of the three dimensions, i.e. interactivity, immersion, and connectivity should be high, but because of technological limitations, behavioral constraints of the customers, and sociological factors, dot-coms are required to carefully evaluate the trade-off between these dimensions. Below we describe these sites in details:

5.1. *amazon.com*

In analysing this site, we found that amazon.com tries to capitalize on a simple mix of interactivity, immersion, and connectivity for selling its different products.

For example, in the music section, the customers can hear samples of popular music and read editorial and customer reviews; in the book section, customers can read reviews of most of books; and in the toy section the customers can view the picture of the toys. These features offer amazon.com the advantages of interactivity and immersion (Garfinkel, 2001). However, amazon.com has been careful not to inundate its sites with heavy use of audio, video, and graphics images, because the advantages of immersion often come at the expense of the interactivity.

amazon.com's main aim is to provide customers a high level of interactivity so that they can scan and search its products quickly (Kampinsky et al., 2001). Although customers can hear 30-s samples of the popular songs, the core idea is to enhance the interactivity rather than the immersion. amazon.com does not provide a high level of connectivity between its customers, except that the customers can read posted editorial and reviews on different products sold by the amazon.com.

5.2. *ebay.com*

Now let us take the example of ebay.com, an auction, Web site. This site has artfully mixed the immersion, interaction, and connectivity (Geller, 2000).

While interactivity is critical, however, for many customers immersion is equally important as they prefer to preview the pictures of the antiques, rare books, and artworks from different angles before making their purchase. Through ebay Web site, customers can view and zoom pictures of rare items along different angels to make a judgment on the authenticity of the items. ebay.com also offers several avenues for connectivity through virtual community, virtual forums, and chat rooms. These virtual forums are used to provide unbiased advice to customers on different topics related to the auctions, antiques, and other related matter.

5.3. schwab.com

schwab.com Web site offers a high level of interactivity. Through schwab.com Web site, customers can view real-time quotes and make transfer of money from one account to another. Novice customers can learn how to conduct complex account transactions by learning through the tutorials presented at schwab.com's Web site (Prochnow, 1999).

Immersion is not paramount to Schwab, as it does not offer a mix of audio, video, and graphic clips. Connectivity is not also important, as it does not provide any means to customers to interact with each other.

5.4. victoriasecret.com

The paramount concern for victoriasecret.com Web site is to create a sense of immersion. Interactivity and connectivity are not that critical. victoriasecret.com Web site provides pictures of petite fashion-models, wrapped with different kinds of bras, lingerie, panties, bikinis, blouses, and other fashionable clothing. There are indications that Victoria is trying to make its site more seductive in which visitors will be guided through different Web pages of swimsuits by supermodel Heidi KIum (Zimmerman, 2001).

The site presents a few opportunities for interactive purposes, but this simple kind of the interactivity is essential for any kind of commercial site. victoriasecret.com does not provide any means for connectivity.

6. Implications

In today's economy dot-coms are increasingly becoming important vehicles for business transactions. As dot-coms begin to get a better understanding of the embedded intelligent tools for enhancing customers' shopping experience, we are likely to find increasing numbers of people using the Internet for conducting business transactions. However, to capitalize on future opportunities, dot-coms must create sticky Web sites that enhance customers' perceptions of realities in the virtual space. This requires balance between interactivity, immersion, and connectivity, and depends on the type of the business. For instance, a dot-com in the fashion industry will need to develop a Web site that offers high degree of immersion to customers, while a dot-com offering personalized services will need a Web site that offers high level of interactivity and some level of connectivity to customers. Therefore to attract customers to a Web site, dot-coms need to carefully blend interactivity, immersion, and connectivity as shown in Table 5.

In some Web sites, customers value high level of interactivity, while the level of immersion is considered secondary. High level of interactivity is critical for those sites where customization and selection of products and services by customers is becoming a competitive necessity (Watson et al., 1998). In some other Web sites, customers value high level of immersion, while the level of interactivity is considered

Table 5
Comparing the features of different kinds of Web sites

Type of the electronic store	Features of Web sites		
	Interactivity	Immersion	Connectivity
Fashion apparel	Medium	High	Low
Financial products and services	High	Low	Medium
Electronic games and puzzles	High	High	Medium
Entertainment services	Medium	High	Low
Auction sites	Medium	High	High
Toys	High	High	Low
Art, antiques and craft works	Low	Low	High

secondary. The firms in the entertainment business may need to develop this kind of Web sites. For example, a dot-com, which wants to advertise a new movie, may like to create an environment of immersion by playing different video and audio clips through its Web site. On the other hand, when a site requires a high level of interactivity as well as a high level of immersion, one of the prime objectives for the dot-com becomes to optimize the trade-off between interactivity and immersion. The dot-coms competing in the electronic games or electronic puzzles usually need to develop these kinds of Web sites. In some other instances, customers value high level of connectivity as well as high level of interactivity. This is especially true for those Web sites where the main aim is to obtain quick customer feedback.

7. Conclusions

In the present study, we showed that in order to attract customers, a Web site is required to create a balance between interactivity, immersion, and connectivity. For example, a dot-com competing in the fashion industry may need to develop quite a different kind of Web site than a dot-com competing in the financial industry. In the fashion industry, immersion is more critical, while in the financial industry, interactivity is far more important. The other factors, which guide a dot-com to balance between interactivity, immersion, and connectivity, are related to customer demands in contents, convenience, customization, and community.

8. Limitations of the study

The scope of the present study is narrow, as it does not directly deal with customers' behaviors in electronic commerce. The study does not specifically address what kinds of customers make their transactions through the Web sites and to what extent the "looks" of a Web site induces customers to make their transactions through the site. However, this study makes an important contribution in bringing

together a number of factors that are likely to enhance customers' experience of feeling reality through a Web site. Attracting customers to a Web site is the first step in conducting a business-transaction through the Internet.

Second, our study has not emphasized the role of human–computer interaction at the group or organizational level (Elliot and Kling, 1997; Gaines et al., 1997; Shackel, 1997). However, our study is oriented at individual level, which affects individual perception on the likeability of a particular Web site.

Third, the study does not empirically check the validity and reliability of the items measuring interactivity, immersion, and connectivity. However, the study offers preliminary steps in measuring the interactivity, immersion, and connectivity.

Fourth, the study looks at only four sites for the validation of the framework. These sites are chosen from a population of 10 sites. Future studies can validate our framework by analysing a larger set of sites chosen randomly.

Fifth, our study has not explored the extent to which customer, who like a particular Web site make their shopping decisions through the Web site. However, as we argued earlier, we believe that the first step in leading to a commercial exchange through a Web site is to attract customers. Therefore, the focus of our study is limited to provide a better understanding of a "sticky Web site."

Finally, the study does not examine the importance of technical, navigational, and functional issues in designing of a Web site. In reality, technical, functional, and navigational issues seriously affect the outcome of the systems development process. However, the main aim of this study has been to focus on customers' perceptions of experiencing realities through the Web sites, as several studies have dealt with these issues (e.g. Shackel, 1991; Trevino and Webster, 1992; Gaines et al., 1997; Zhang and von Dran, 2000).

Appendix A

Please respond the following questions on a 5-point scale, where
1 = Not at all.
2 = To some extent.
3 = To a moderate extent.
4 = To a large extent.
5 = To a very large extent.

Questions

1. It is easy to manipulate dot-coms offerings.
2. It is quicker to manipulate doct-coms offerings.
3. The site is beautiful (eye-catching).
4. The site is sexy.
5. I can easily chat to others who are logged on this site.
6. I can find others comments on the company's offering through this site.

	amzon.com	e-bay.com	schwab.com	victoriasecret.com
Question 1				
Question 2				
Question 3				
Question 4				
Question 5				
Question 6				

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