Enhancing personal interaction through the web interface in online shopping

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Abstract

At present, most e-commerce websites are low in social presence. Thus in contrast with traditional face-to-face business settings, they are difficult to satisfy online consumers' social needs for interacting with other humans. Following this perspective, a significant number of literature calls for a need to improve e-commerce web sites' social presence in addition to the well-recognized aspects of perceived usefulness and perceived ease of use. In this study, the author finds that within the context of an e-commerce web site selling electronic products (mobile phone), the adoption of interface design features of socially rich text and picture (enabling imaginary interaction with other humans) and virtual community (providing means for actual interaction with other humans) is an efficient way of increasing social presence. Results, however, also suggests that social presence per se is not significant in predicting online purchase intention. Even so, e-vendors may also benefit from offering high level of personal interaction on their e-commerce web sites as socially rich text and picture and virtual community have influential impacts on trust and perceived value, the two important predicators of purchase intention found in this study. Further analysis of the reasons behind are conducted and implications of these findings for theory and practice are discussed.

Keywords: Personal interaction; socially rich text and picture; virtual community; e-commerce; social presence; trust; perceived value; satisfaction; technology acceptance model (TAM)

1. Introduction

Thanks to the fast development of information technology, Internet has become the core component of our contemporary society and has brought about multi-faceted impacts. However, while the advantages of electronic commerce (e-commerce) are well recognized, an interesting yet confusing phenomenon is that the value of online business sales, especially business-to-consumer (B2C) e-commerce, is still relatively small (Hassanein and Head, 2007). Nowadays online vendors face two main challenging questions:

1) Why consumers do not purchase in an online shopping environment?
2) How to achieve competitive advantages over other counterparts? Because Internet makes it relatively easy to switch from one web site to another with similar products or services (Li et al., 2006).

A traditional view is that a user-friendly interface is a vital key to the success of commercial web sites. Nielsen (1999) calls for a need to improve web site usability in a belief that low usability will lead to unsatisfied users and the site will not grow into long-term success. Davis's (1989) technology acceptance model (TAM) is also well regarded in predicting information system usage. Constructs of perceived usefulness (PU) and perceived ease of use (PEOU) in this model have been widely adopted in extensive e-commerce empirical studies (Bhattacherjee, 2001; Devaraj et al., 2002; Gefen and Straub, 2000; Gefen et al., 2003; Koufaris, 2002). On the other hand, most of the design guidelines for generating web interfaces have long been centering predominantly on facilitating efficient communications between the user and the web site (Kumar and Benbasat, 2002).

The traditional view treats a web site simply as an information technology. However, as shown by recent studies, the advice of usability experts (for example, Nielsen), tends to only address functional and performance aspects of web sites (Hassanein and Head, 2007), which cannot satisfy online shoppers' social needs. Individuals' social motives have long been thought of as a significant contributor to traditional shopping behavior (Tauber, 1972). Therefore, as a supplement to the traditional view, social presence theory has been introduced to investigate e-commerce issues (Cyr et al., 2007; Gefen and Straub, 2003; Hassanein and Head, 2006, 2007). The social presence view focuses on one of the major differences between offline and online consumer markets. In fact, the lower level of social presence is characterized by less information richness, reduced interactivity, and decreased presence of human warmth and sociability in an online environment (Gefen and Straub, 2003; Hassanein and Head, 2006, 2007). The social presence view gives attention to fulfillment of consumers' social needs in Internet settings. Nowadays, many online stores are low in social presence, displaying products with little emotional or social appeal (Hassanein and Head, 2007) and are relatively lacking social forms of interaction (Childers et al., 2001).

The reduced level of social interaction also adversely affects consumer trust with e-vendors (Gefen and Straub, 2003). The importance of trust in e-commerce settings has been recognized in extensive past research (Bhattacherjee, 2002; Gefen, 2002; Gefen and Straub, 2003; Gefen et al., 2003; Pavlou, 2003; Pennington et al., 2003-4; Suh and Han, 2003). Researchers have argued that creation of trust is closely related to the context of a social environment (Blau, 1964; Fukuyama, 1995; Gefen and Straub, 2003; Luhmann, 1979). Accordingly, online shopping environment lacking social cues (Cyr et al., 2007) is thought to negatively influence the development of consumer trust because social proximity and face-to-face interaction with sales people and other shoppers are replaced by a complex social-technical system (Riegelsberger et al., 2003). Without trust, online shoppers' purchase intention is stifled.

One of the major objectives of this research is to further the understanding of social presence in the field of e-commerce: whether it indeed is associated with consumers' purchase intention specifically within the context of a B2C web site selling electronics product. If so, assessing the relative importance of social presence in comparison with TAM constructs, trust, satisfaction and perceived value[1] is also necessary in order to evaluate the relative importance of these factors in predicting online purchase intention. The other objective of this study to investigate how certain web site features (that help consumers evoke a sense of interacting with other human beings) can be manipulated to impact the predicators of online purchase intention found in this study.

2. Literature Review

Online consumer bears the dual nature of both a traditional consumer and an information technology user (Teo et al., 2003). Hence, in order to study online B2C relationships, many variables have been proposed from different perspectives. Among them are social presence, trust, perceived value, satisfaction and TAM constructs of PU and PEOU. Our conceptual model in Fig.1 indicates the hypothesized relationships between these six independent variables and purchase intention.

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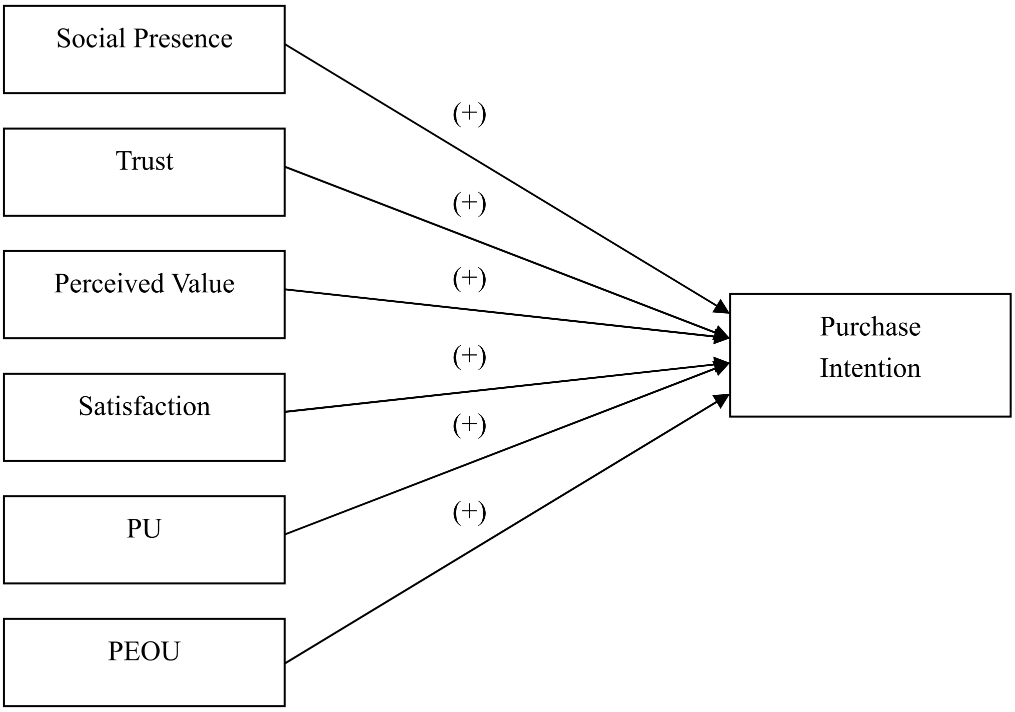
[1] Satisfaction and perceived value are also important in predicting IT adoption and have received much investigation in IS and marketing studies.

Fig.1. The Conceptual Model



2.1 Purchase Intention

Limited by the difficulty to measure actual buying behavior in a laboratory environment, previous researchers use purchase intention and attitude as two appropriate alternatives. According to Davis's (1989) TAM model, a user's intention to use an information system impacts actual usage of the system. In the context of an online shopping environment, use intention refers to intention to use a B2C web site to purchase a product or service. Consumer attitude is also important not only because it contributes to user's intention to use a system (Ajzen, 1989; van der Heijden et al., 2003) but also because it directly impacts the actual use of the system as use intention does (DeSanctis, 2003). In this study, we choose purchase intention as the endogenous construct (rather than attitude) due to two reasons.

First, there has long been a dispute on the role of attitude as a predictor of purchase behavior. Such debate can trace back to the era of traditional business settings. Early studies have suggested that attitude is unrelated or slightly related to overt behavior (Wicker, 1969); this is even more the case when attitude is displayed toward an object. Accordingly, others have proposed that certain types of measures of attitudes, and particularly purchase intention, may effectively be used as behavioral determinants (Douglas and Wind, 1971). Moreover, in an online shopping environment, the link between consumer attitudes and purchase intention are heavily influenced by other factors such as trust and attitude may not be important in predicting actual purchase behavior. As such, purchase intention is a more immediate, reliable, and persuasive variable predicting online buying behavior.

Second, Douglas and Wind (1971) argues that the correlation between a general measure of intention and general behavior will be higher than between a specific measure of intention and specific behavior. Since the present study asks participants to indicate their likelihood to purchase a product (mobile), rather than to purchase a specific style of a product, the context is general.

2.2 Social presence

While the traditional usability and TAM view focus on the operational aspect of the web site, viewing it simply as an information technology, social presence theory borrowed from communication literature, has been recently introduced to explore online shopping environments, indicating that e-commerce settings lack human warmth and sociability (Gefen and Straub, 2003; Hassanein and Head, 2006, 2007).

2.2.1 Social presence and its theoretical foundation

Social presence refers to the degree to which a medium allows a user to establish personal connection with other users (Short et al., 1976). Some researchers tend to stress on its close relationship with the richness of the media or the interactivity afforded by the media (Daft and Lengel, 1984; Rice et al., 1989; Straub, 1994). The theoretical foundation of social presence consists of media richness theory and social presence theory (Kumar and Benbasat, 2002).

Media richness theory is first brought up by Daft and Lengel (1984) and it makes two assumptions: (1) organizations process information to reduce uncertainty and equivocality, and (2) commonly used media in organizations works better for certain tasks than others. Later, using four criteria, Daft, Lengel, and Trevino (1987) presented a media richness hierarchy which incorporates four media classifications: face-to-face, telephone, addressed documents, and unaddressed documents. These criteria are: (1) the availability of instant feedback, (2) the capacity of the medium to transmit multiple cues such as body language, voice tone, and inflection, (3) the use of natural language, and (4) the personal focus of the medium. Enjoying the ability to transmit instant feedback, body language, facial expressions and tone of voice, face-to-face communication is regarded as the richest communication media, followed by telephone, e- mail, and memos and letters. Electronic media like e-mail and fax are generally viewed as information-lean because they can only convey facts. Web site is even leaner as its contents are generated by hosting server, representing a machine response rather than that of a social being (Reichheld and Schefter, 2000). Whereas high presence medium is rated toward the sociable, warm and personal end of the continuum (Kumar and Benbasat, 2002), lean medium (representing decreased level of social presence) is rated as more unsociable, insensitive, cold, and impersonal (Rice and associates, 1984; Sherblom, 1988). Therefore, it is not surprising that at present most e-commerce web sites are viewed as lacking human warmth and sociability.

Short et al.'s (1976) social presence theory is surprisingly similar to media richness theory (Carlson and Davis, 1998), where high social presence characterizes face-to-face communication as opposed to low social presence characterizes electronic media and paper-based mail (Straub and Karahanna, 1998).

2.2.2 Social presence and media selection

Researchers have long wondered which medium one would adopt to accomplish a particular task. Both media richness theory and social presence theory argue that use of a medium is effective when characteristics[2] of the chosen medium match the requirements of the aimed task. For example, a girl may prefer to use email to refuse the dinner invitation from the boy she has no crush on. Actually, these two theories have been grouped together as the "task-medium fit" hypothesis to explain media selection (Straub and Karahanna, 1998).

However, regardless of the plethora of research efforts giving empirical evidence to support the "task-medium fit" hypothesis, some fail (Lee, 1994; McLeod and Jones, 1987; Rice and Shook, 1988; Rice and Shook, 1990). One of the major reasons is that this hypothesis is insufficient to predict medium usage (Carlson and Davis, 1998; Straub and

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[2] The world "Characteristics" refer to the degree of information richness in media richness theory and social presence in social presence theory.

Karahanna, 1998). Hence, researchers have also focused their attention on other determinants including: (1) task, (2) medium, and (3) social environment (Straub and Karahanna, 1998). For example, as one of the components of social environment, presence of a critical mass of users is important because a medium cannot be used without sufficient communication partners (Markus, 1987). The impacts of user attributes have also been found. Papacharissi and Rubin (2000) argue that people who avoid face-to-face interaction tend to use Internet (traditionally thought of as a lean medium) more for interpersonal communication. In discussing consumers' selection of e-commerce web sites to perform purchase tasks, this paper does not take such intervening factors into consideration in order to simplify the research process. This is also in line with previous e-commerce literature (Gefen and Straub, 2003; Hassanein and Head, 2006, 2007). And we believe that it will be beneficial if we step back and examine shopping motives within the context of traditional consumer market.

Table 1. Tauber's social motives for shopping

- *Social Experience Outside the Home*
  Shopping offer a time and place for social interaction; provide the opportunity for a social experience outside the home; result in direct encounters with friends and other social contact.
- *Communication With Others Having a Similar Interest*
  By providing hobby-related goods, store enable people who share similar interest to interact with each other and to talk with sales personnel who provide special relevant information
- *Peer Group Attraction*
  Shopping is not necessarily related to common interests, but reflects a desire to be with one's peer group or a reference group to which one aspires to belong
- *Status and Authority*
  Shopping enable people to command attention and respect; attain a feeling of status and power
- *Pleasure of bargaining*
  People enjoy the process of bargaining during shopping

Tauber (1972) proposes that apart from those related to the product itself, traditional shopping behavior is also motivated by a variety of social needs (listed in Table 1), among which four motives (except pleasure of bargaining) can be adopted in Internet settings where online shoppers' needs for social interaction can also be found (Parsons, 2002). According to media richness theory, web sites, in their simplest and barest form are information-lean (Gefen and Straub, 2003). Thus it is difficult to satisfy online shoppers' social needs. While Ma and Leung (2005) suggest that hardware and software designers may consider including more human and warm elements in communication software tools, we believe that it can be applied in e-commerce web interface either. Therefore, we hypothesize that:

***H1a** – The higher level of social presence consumers perceive when shopping online, the higher purchase intention they will have.*

***H1b** – Consumers' perception of social presence is a significant predicator of online purchase intention.*

2.2.3 How to enhance social presence

Dennis and Valacich (1999) indicate that: (1) no one medium could be viewed as richest in Daft & Lengel's media richness hierarchy; (2) one medium may possess levels of communication capability depending upon how it is configured and used; (3) ranking media in absolute terms of richness or social presence is not practical. Kumar and Benbasat (2002) argue that "the versatility of web allows different configurations to be used to support the avowed goals of a web site (from selling products and information to enhancing corporate image)". Consumers' perception of social presence can be enhanced through interface elements that provide personal interaction with other humans. Table 2 is a non-exhaustive list of web site features that have the potential impacts on perceived social presence. According to Hassanein and Head (2007), these features can be categorized into:

- Features stimulating imaginary interaction with other humans, including socially rich text and picture content, personalized greetings, human audio and video, etc.
- Features providing means for actual interaction with other humans, including online communities, message boards, online chat, e-mail after-sales support, human web assistants.

Table 2. List of web site features capable of infusing a sense of social presence

Study	**Web site features suggested to instill social presence**	**Dependent variable**	**Study context**
Aberg and Shahmehri (2000)	Human web assistants	Attitude, Learnability, Efficiency, Relevance	Reel.com
Cyr et al. (2007)	Message boards, Socially-rich picture content	Customer Loyalty	Fictitious e-Service web site
Gefen and Straub (2003)	E-mail after-sales support, Socially-rich picture content, Socially-rich text content, Personalized greetings	Intention to purchase (airplane ticket)	Travelocity.com
Hassanein and Head (2007)	Socially-rich picture content, Socially-rich text content	Attitude (toward the site selling apparel)	Fictitious B2C web site
Hassanein and Head (2005-6)	Socially-rich picture content, Socially-rich text content	Attitude (toward the site selling headphone)	Fictitious B2C web site
Hostler et al. (2005)	Human web assistants	Task performance and task outcomes	Fictitious B2C web site
Teo et al. (2003)	Virtual community, Online chat	Intention to purchase (a new computer system)	Fictitious B2C web site
Kumar and Benbasat (2002)	Virtual communities, Chats, Message boards, Personalized greetings, Human audio, Human video	N/A (Authors propose the possible dependent variables including attitude and users' evaluation of web site or other users)	N/A

This paper adopts socially rich text and picture content and virtual community.

By helping online shoppers evoke the imagination of interacting with other humans, socially rich text and picture have been empirically shown to be an effective way of increasing online shoppers' perceived social presence (Hassanein and Head, 2007). Furthermore, compared with its counterparts like human audio and video, socially rich text and picture (if given proper size and resolution) are easy to access on Internet because they do not require much bandwidth. As such, most online vendors tend to incorporate these web site elements even though they know little about them.

Table 3. List of classification of interactivity

Classification proposed by Hoffman and Novak (1999)	Classification proposed by Szuprowicz (1996)	Low ↓ High
Machine interactivity that occurs between human and machine; which is further divided into user-document interactivity and user-system interactivity by Szuprowicz (1996)	**User-document interactivity** the level users are not able to influence or manipulate file contents (for example, socially rich picture)	
	User-system interactivity the level users can manipulate the content by changing its characteristics	
Person interactivity that occurs between humans through a medium (for example, online-forum)	**User-user interactivity** the level users operate real-time to create response between two or more users	

In this study, virtual community is selected as a form of actual social interaction. With the increasing development of open source movement, free virtual community software is easy to retrieve on Internet. It is so convenient to use that even e-vendors without adequate IT literacy may add this web site feature to their online stores. Enjoying the ability to aggregate people who share same interests or other commonalities together, virtual community can be the conduits where interpersonal relationships3 can be forged (Kumar and Benbasat, 2002). In contrast with socially rich text and graphic information, the effects of virtual community may be even more pronounced. According to the extant classification of interactivity (showed in Table 3), virtual community representing person interactivity, is more superior to socially rich text and picture representing user-document interactivity in terms of interactivity level. Moreover, virtual community indeed enables shoppers to interact with other social beings. Such interaction is realistic, not fictitious. While Hassanein and Head (2006) found that the use of emotive text and picture didn't have significant effects on consumer attitude, Teo et al.'s (2003) work indicated that virtual community was a major contributor to the formation of positive attitude towards an e-commerce web site selling electronics product[4].

2.3 Trust

Trust is a complex and multidimensional concept (Papadopoulou et al., 2001) which has been conceptualized by the plethora of research efforts in various ways. According to the summarization by Gefen et al. (2003), trust refers to "(1) a set of specific beliefs dealing primarily with the integrity, benevolence, and ability of another party; (2) a general belief that another party can be trusted, or the willingness of a party to be vulnerable to the actions of another; (3) affect reflected in feelings of confidence and security in the caring response of

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[3] In their paper, Kumar and Benbasat (2002) suggest that sometimes, these relationships can be transaction-oriented, like users who share their buying experiences may provide guidance to others.

[4] Both Teo et al.'s and Hassanein and Head's experiments use fictitious B2C web site as study context. Specifically, Tel et al.'s web site sells computer system whereas Hassanein and Head select headphone. These two electronics products are different in nature but according to Burke's (2002) product characterization scheme, both can be attributed to infrequently purchased durable where consumers want retailers to provide detailed product information and excellent service, and rate low on the fun dimension.

the other party, or (4) a combination of these elements”. This study adopts the second perspective where trust is also viewed as the willingness of a party to behave based on expectation about the behaviors of others when considering the risk involved (Luhmann, 1988), a perspective that is also consistent with other recent e-commerce studies (Gefen and Straub, 2003; Hassanein and Head, 2006, 2007).

2.3.1 Trust in online environment

The value of trust has been recognized in various academic fields (Papadopoulou et al., 2001) such as sociology (e.g., Lewis and Weigert, 1985), psychology (Erikson, 1963), computer-mediated communication (e.g., Ma and Leung, 2005), economics (e.g., Williamson, 1991) and marketing (e.g., Morgan and Hunt, 1994). Researchers (Gefen et al., 2003; Reichheld and Schefter, 2000) claim that trust is especially important within the context of an online environment because it involves typically high social complexity and risk[5]. Such high social complexity and risk stems from different aspects between electronic and traditional environment. Past studies (Cyr et al., 2007, Hassanein and Head, 2007) conclude that:

- E-commerce allows vendors of all sizes to extend their market base to foreign countries; consequently, consumers may be exposed to risks incurred by the differentiation of laws and regulations across these countries.
- During the transaction process, online shoppers have less control of the data

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[5] Gefen et al. (2003) argues that trust is an effective way of reducing social complexity that refers to the fact that on the one hand, people inherently have the need to understand the behaviors of other human beings, on the other hand, it seems to be difficult to do so because these behaviors are unforeseeable that cannot easily be predicted or controlled; people adopt trust in a belief that others will no engage in undesirable yet possible opportunistic behaviors, subjectively ruling out the risks they may suffer. In fact, trust is viewed as a prerequisite of many business transactions (Gefen and Straub, 2003).

transferred. Though advanced encryption technology such as SSL has been introduced to protect sensitive information (e.g., credit card number), most online consumers know nothing about it.

- Due to low barriers to entry and exit in selling goods and services, online shoppers may suffer from unexpected yet possible losses by those who considered “fly-by-night”.
- The absence of physical elements in online environment hampers consumers to make correct assessment of products and vendors.

Furthermore, in an online environment, social proximity and face-to-face interaction with salespeople and other shoppers are replaced by a complex social-technical system (Riegelsberger et al., 2003) where the behaviors of e-vendors cannot be monitored (Reichheld and Schefter, 2000). E-vendors may easily take advantages of consumers, engaging in a number of undesirable yet possible opportunistic behaviors such as unfair pricing, conveying inaccurate information, violation of privacy, unauthorized tracking of transactions, and unauthorized use of credit card information (Gefen et al., 2003). A typical example is that after providing e-mail address during registration process, consumers may be forced to receive bombardment of spam emails.

Therefore, building trust is an essential aspect of online business. It has been shown to positively impact intended use (Gefen et al., 2003), transaction willingness (Bhattacherjee, 2002) and customer loyalty (Cyr et al, 2007) in e-commerce settings. Gefen and Straub (2003) further confirm that trust has a strong effect on purchase intention in an e-service web site.

Hence, regardless of domain difference[6], we are still confident to hypothesize that:

***H2** – Trust is positively related to online purchase intention.*

2.4 Perceived value

The concept of perceived value has been defined in a large body of previous literature. It has been proposed as a trade-off between “give” and “get” components of a product where “give” refers to the price paid and “get” refers to the product quality (Chang and Wildt, 1994). Modeling the perceived value of a product based solely on price and product quality is insufficient and simplistic. Therefore, other researchers associate perceived value with consumer’s assessment of the ratio of perceived benefits and perceived costs from purchasing the product in question (Liljander and Strandvik, 1992). Despite of these research efforts, in this study, the notion of perceived value needs expansion because an e-commerce web site per se is not a product that one purchases but a channel to purchase products (Keeney, 1999). Earlier work by Toe et al. (2003) may provide guidance to help us conceptualize the concept of perceived value of a commercial web site. In order to examine the effects of web site interactivity on the formation of user attitude, Teo et al. (2003) proposed a research model where perceived value emerged as a key mediating factor was measured by the estimation of the usefulness, importance, helpfulness and worthiness of the web site. Here we adopt this perspective on perceived value that an e-commerce web site is considered valuable when users feel that it provides them with desirable means and ends of action.

Keeney (1999) has suggested that consumers’ perception of commercial web site value can be maximized by providing opportunities for personal interaction. However, even for the same e-commerce web site, consumers' perceived value may vary. For example, one may find the product information like images showing the product being used by a nice girl attractive and useful, yielding invincible purchase intention whereas another may find it fake, exaggerated and even dubious, thus rating low on the site and switching to its counterparts.

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[6] Different from B2C e-services, the present study focuses on electronics product web site.

In the context of mobile internet (M-Internet) adoption, Kim et al.'s (2003) Value-based Adoption Model (VAM) demonstrates that consumers' perception of the value of M-Internet is a principal determinant of adoption intention as it represents an overall assessment of the adoption object. Chong et al. (2003) contend that perceived value is important because it mediates the relationship between trust and purchase intention in online auction. Therefore, we hypothesize that:

***H3** – Perceived value is positively related to online purchase intention.*

2.5 Satisfaction

While perceived value is related to cognition, satisfaction is primarily viewed as an affective-based construct (Patterson and Spreng, 1997). It was initially defined as an evaluation of an emotion that reflects the degree to which a consumer believes that the possession and (or) use of a service evokes positive feelings (Cronin et al., 2000). When it comes to the IS field, according to ISO 9241-11 (1998), satisfaction can be described as the user's comfort with and positive attitude towards the use of the system. In the present study, the use of the system refers to purchasing (mobile phone) on the experimental e-commerce web site.

The role of satisfaction as being central to predict continuous purchasing and repeated patronage has long been a source of debate. Some reviews of the literature have found that user satisfaction is an important factor associated with continuous purchasing and repeated patronage (Bhattacherjee, 2001; Koivumaki, 2001). Others, however, have contended that satisfaction is a necessary but not sufficient factor for continuous purchasing (Morgan and Hunt, 1994; Oliver, 1999). This is even more the case when a consumer has many available choices (Jones and Sasser, 1995).

Regardless of such debate, the present study focuses on initial purchase behavior, which is the period when a consumer visits an e-commerce web site and makes purchase decision for the first time. It has been suggested that e-vendors may benefit from creating an enjoyable online shopping environment because consumers purchase products both for their utilitarian and hedonic purposes (Childers et al., 2001). Other studies have also shown the positive impacts of satisfaction on the outcome of the shopping experience within various contexts (Bolton and Lemon, 1999; Hallowell, 1996; Teo et al., 2003). Thus, we hypothesize that:

H4 *– Satisfaction is positively related to online purchase intention.*

2.6 TAM constructs

Proposed by Davis (1989), TAM model has long been well regarded in predicting information system usage, a model suggesting that the intention to use a technology is directly affected by PU (perceived usefulness) and PEOU (perceived ease of use). PU reflects a person’s cognitive assessment of the rewards of using a particular system. PEOU is a person’s cognitive belief of the resources expended to achieve certain goals when using a particular system. TAM model has been extensively applied in numerous e-commerce empirical studies (Bhattacherjee, 2001; Devaraj et al., 2002; Gefen and Straub, 2000; Gefen et al., 2003; Koufaris, 2002) with the underlying logic that e-vendor interacts with consumers through a web site that is, in essence, a type of information technology. Gefen et al. (2003) attest that "the more useful and easy to use is the web site in enabling the users to accomplish their task, the more it will be used". Following this perspective, we hypothesize that:

H5 *– PU is positively related to online purchase intention.*

H6 *– PEOU is positively related to online purchase intention.*

More important, as previous mentioned, the present study will evaluate the relative importance of social presence, trust, perceived value, satisfaction, TAM constructs in predicting online purchase intention. Thus, the following research question is raised:

RQ1 – *What is the relative importance of social presence, trust, TAM constructs, satisfaction and perceived value in predicting online purchase intention?*

Effort is also put in exploring:

RQ2 – *By helping consumers evoke a sense of interacting with other human, how certain web site features can be manipulated to impact the predicators of online purchase intention found in this study?*

We believe the answers to these research questions will provide the most immediate and attainable recommendations for practitioners.

3. Research Methodology

3.1 Task and procedure

To answer the proposed research questions and test our proposed hypotheses, an empirical study was conducted where personal interaction levels were manipulated within three groups. Each group had 20 members, consisting of 10 male and 10 female. The equal number of male and female in each group allowed us to eliminate confounding effects incurred by gender difference.

We created three versions of web sites representing a fictitious electronics product company (called iBuy.com) for these three groups. The web site for each group had the same products and followed the same design but differed in terms of personal interaction level that was operationalized with different types of web design features as shown in Table 4. In contrast with PI-1 where product information was shown in a simple yet functional form, higher level of personal interaction was infused into PI-2 and PI-3 through imaginary interaction elements of emotive text and picture and through actual interaction element of virtual community respectively. The three groups conducted the experiment entirely online and they might access to the web site from any computer with an Internet connection. Snapshots of our self-created web pages are shown in Appendix A which displays the same mobile phone with low, medium and high level of personal interaction respectively.

Subjects were told to assume the role of class presidents who need accomplish the task of purchasing a mobile phone as a gift for a new classmate[7]. Subsequently, they were

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[7] Mobile phone was chosen as it is a product that all university students would be familiar with. When Leung (2002) indicated that ICQ is popular with youngsters, he (2001) further attested that the frequency of students using ICQ is positively related to ownership of mobile phones. Hence, it is reasonably expected that university students are significant potential consumers of mobile phone.

Table 4. Experimental manipulation of personal interaction

Web site name	Interpersonal interaction level	Available features
PI-1	Low	• product information
PI-2	Medium	• all features of PI-1 • socially-rich text and picture
PI-3	High	• all features of PI-2 • virtual community

asked to browse through the study web site for that purpose. In this experiment, it was not necessarily for subjects to make a real order. Instead, they were told to focus their attention on viewing the specific product information and evaluate the web site. Upon the completion of the experimental task, subjects were given a questionnaire to fill in personal information voluntarily. Open-ended questions were also raised to allow for deeper explanations and discussions.

3.2 Subjects

A total of 60 subjects completed this study. Subjects were undergraduate or graduate students at three major Hong Kong universities and each participated in only one group. They were randomly assigned to three personal interaction groups so as to minimize confounding effects incurred by potential variations in individual characteristics. The three groups were separated by different sessions. The web site for each experimental group was only available during its corresponding session and it would be removed from the hosting server after the session was due. Exquisite gifts were prepared for subjects to ensure that they would take this study seriously. Based on personal information provided by questionnaires, ANOAV tests confirmed that there were no significant differences across treatment groups in terms of individual characteristics like age, Internet and online shopping experience. Our randomization of assignment was successful as expected.

3.3 Measurements

All the research constructs were measured on seven-point Likert scales adapted from previous studies, with 1 representing strongly disagree, 4 representing neutral, and 7 representing strongly agree. Minor modifications were made to fit the specific context of a B2C web site selling mobile phone in this study. Specifically, social presence and purchase intention were measured using questions adapted from Gefen and Straub (2003). Trust was measured using two questions adapted from Gefen and Straub (2003), one question from Gefen et al. (2003) and one question from Pennington et al. (2003). TAM constructs (perceived ease of use and perceived usefulness) were measured using questions adapted from Hassanein and Head (2007). Perceived value was measured using questions adapted from Teo et al. (2003). Satisfaction was measured using questions adapted from Li et al. (2006). All the items used in this study are presented in Appendix B.

As shown in Table 5, the reliability for social presence, purchase intention, trust, perceived value, perceive ease of use, perceive usefulness and satisfaction were high, with Cronbach's alphas equal to 0.92, 0.91, 0.88, 0.90, 0.80, 0.90 and 0.93 respectively.

Table 5. Measurement Model

Construct	Mean	SD	Cronbach's Alpha
Social Presence	21.0	7.1	0.92
Purchase Intention	12.7	3.9	0.91
Trust	16.9	4.9	0.88
Perceived Value	18.0	4.0	0.90
Perceived Ease of Use	19.2	4.1	0.80
Perceived Usefulness	18.3	4.4	0.90
Satisfaction	17.5	5.1	0.93

3.4 Data analysis

First, Pearson's correlational coefficients were computed to test the proposed six hypotheses. Next, hierarchical regressions were run to determine the relative importance of social presence, trust, perceived value, perceived usefulness and satisfaction in predicting online purchase intention. Finally, a serious of one-way ANOVAs was conducted to check potential differences across the three experimental groups in terms of perceived social presence and other factors, if they had been shown to be important predicators of purchase intention.

4. Results

4.1 Hypotheses testing

In order to test the six hypotheses, correlational analyses were performed. Results presented in Table 6 show that social presence ($r = .64$, $p < .01$) had significant effects on purchase intention. This indicates that the higher social presence consumers perceived when they shopping online, the higher purchase intention they would have on this visited web site. Thus, H1a was supported. Furthermore, perceived value ($r= .72$, $p < .01$) also had significant effects on purchase intention. It suggests that perceived value is highly predictive of online purchase intention. This finding extends the earlier work by Teo et al. (2003), who attest that high perceived value of a commercial web site contributes to the formation of more favorable attitude towards the site. Thus, H3 was supported.

Table 6. Hierarchical regression analysis of online purchase intention using social presence, trust, perceived value, satisfaction, perceived value, perceived ease of use as predicators

Predictors	Purchase Intention	
	r	β
Social Presence	.64**	.10
Trust	.83**	.52***
Perceived Value	.72**	.25*
Satisfaction	.77**	.21
PU	.58**	-.01
PEOU	.53**	-.09
R^2		.78
Final adjusted R^2		.76

* $p < .05$; ** $p < .01$; *** $p < .001$

Purchase intention was also found to be positively related to trust ($r = .83$, $p < .01$), satisfaction ($r = .77$, $p < .01$), PU ($r = .58$, $p < .01$) and PEOU ($r = .53$, $p < .01$). Thus, H2, H4, H5, H6 were also supported. These findings echo various previous studies (Bhattacherjee, 2002; Bolton and Lemon, 1999; Gefen and Straub, 2003; Hallowell, 1996).

4.2 Predicting purchase intention

In order to answer the first research question, a hierarchical regression was conducted to examine the relative importance of social presence, trust, perceived value, satisfaction, PU and PEOU in predicting online purchase intention. Results presented in Table 6 reveal that trust (β = .52, p < .001) and perceived value (β = . 25, p < .05) were two important predicators of purchase intention. They combined to explain 76 percent of the variance. While both were important, trust appeared to be a stronger predicator than perceived value. Results also indicate that social presence is not significant in predicting purchase intention in this study. Thus, H1b was not supported.

4.3 Analysis of effects of web site features

In response to the second research question, a serious of one-way ANOVAs was conducted to examine the effects of imaginary interaction elements of emotive text and picture and actual interaction elements of virtual community. ANOVA tests were run comparing PI-1, PI-2 and PI-3 on the aspects of perceived social presence, trust and perceived value, with the underlying logic that the three experimental groups in this study were only differed in terms of personal interaction level, thus any difference across PI-1, PI-2 and PI3 could be directly attributed to the incremental level of personal interaction (as shown in Table 4). Table 7 summarizes the results.

It is showed that the three experimental groups were significantly different in terms of subjects' perception of social presence ($F(2, 57) = 44.91$, $p < .000$). Specifically, subjects in PI-3 (M = 27.15) perceived significantly higher social presence than in PI-2 (M = 22.05) and social presence in PI-2 is significantly higher than in PI-1 (M = 13.75).

Further, as previously suggested, trust and perceived value were strong predicators of online purchase intention. So next, we explored examining the effects of web site features on these two factors. The three groups were significantly different in terms of trust ($F(2, 57)$ =

8.03, $p < .005$) and perceived value ($F(2, 57) = 10.54$, $p < .000$). Specifically, as shown in Table 7, there were no significant differences for trust and perceived value between PI-1 and PI-2. Hence, while the use of imaginary interaction elements of textual and graphic information did have the impact on the perception of social presence, it did not influence the two predicators of purchase intention found in this study. However, there were significant differences between PI-2 and PI-3 and between PI-1 and PI-3 in terms of trust and perceived value. This finding indicates that compared with emotive text and picture, the use of virtual community on web site design was a more effective way of increasing users' trust with e-vendor and their perceived value of the web site.

Table 7. ANOVA comparing the social presence, trust, perceived value between PI-1, PI-2 and PI-3

	PI-1 Low Mean	PI-2 Medium Mean	PI-3 High Mean	Contrast			Overall F, p≤
				PI-1 PI-2 p≤	PI-2 PI-3 p≤	PI-1 PI-3 p≤	
Perceived social presence	13.75	22.05	27.15	.000	.001	.000	.000
Trust	14.25	16.50	19.85	.115	.021	.000	.001
Perceived value	15.70	17.55	20.70	.098	.006	.000	.000
N =	20	20	20				

5. Discussion

In traditional business settings, Tauber (1972) has proposed that consumers' shopping behaviors are significantly motivated by a variety of social needs. Afterwards, with the explosion of e-commerce selling products and services online, Parsons (2002) indicated that such social needs for social interaction can also be found within an online shopping environment. However, web sites, in their simplest and barest form are low in social presence (Gefen and Straub, 2003), thus they are difficult to satisfy online shoppers' social needs for social interaction. Hassanein and Head (2007) suggested that social presence can be infused into web interface through imaginary interaction elements of socially rich text and picture. Following this line of inquiry, the present study intended to investigate web site features that help online shoppers evoke a sense of interaction with other human beings and to examine their effects on the predicators of online purchase intention. To accomplish it, in addition to socially rich textual and graphic information suggested by Hassanein and Head (2007), interface feature of virtual community was also selected as it provides means for actual interaction with other humans. We hypothesized that consumers' perception of social presence was a significant predicator of online purchase intention. Results in Table 6 and Table 7, however, indicate that while the selected web site features do have influential impacts on it, social presence is not significant in predicting consumers' intention to purchase from an e-commerce web site. Rather, trust and perceived value are two important predicators and they are heavily influenced by the selected interface features in this study. Further analysis of the open-ended questions disclosed some interesting insights into our research findings:

- For the low personal interaction web site, some subjects commented that it was "ease to use" and presented the product in a "simple and clear" layout that was "convenient to view and understand the main features of the product". However, most subjects agreed that “The product information was quite normal that could be found from other electronics product web site”. This version of web site was generally “boring”, “of little importance”, and at the very least, “lacking trust”.

- For the medium personal interaction web site, it is interesting to note that the existence of socially rich text was ignored by most subjects. Even for those who had noticed the textual information, comments were made toward the negative end of the continuum due to “a strong advertisement feeling” in description that is “useless in assessing the product”. By contrast, the addition of socially rich pictures to web interface were considered as “colorful”, “creative”, “exciting”, “interesting”, “entertaining” and “attractive”. It offered “a nice shopping experience” that subjects have an imagination of interacting with the people pictures” and “a sense of connection with the web site”. They also consented that it provided more or less additional information useful in assessing the product. Reasons were given like “I am happy to see people showing products in various poses and scenes”, “I got some ideas related to the use of the mobile phone” and “It provides me with a new perspective understanding the product”. However, socially rich pictures might also be misleading because “they tend to focus on the appearance or style issue of the mobile phone rather than its digital properties”. On the other hand, some subjects commented that they “have no trust with the web site” as “the sexy girls and the pictures have strong commercial feelings”. “I need objective information like other people’s comments” another subject said.
- For the high personal interaction web site, subjects tended to value high on the

> addition of virtual community to web interface, the benefits of which can be summarized into three aspects. First, it emerges as "a platform in which consumers can communicate with each other, providing a form of social interaction". The process of viewing other consumers' feedbacks is "interesting" and "quite pleasing". Second, it gives consumers more information. "Potential buyers may seek advice from others who have already bought the product". One subject remarked that "it gives me some confidence (in purchase decision)". This web site feature becomes particularly "helpful" for laymen because they "need some basic and extra knowledge regarding the product". Third, it helps building trust with the e-vendor. By "displaying other consumers' response", virtual community "reduced the subjective tendency of the website. While some commented that "I am not sure whether these feedbacks are believable" or that "too much information, it makes me upset", the majority agreed that this version of web site was "valuable" and "persuasive".

Accordingly, the impacts of socially rich text and picture and virtual community on trust may be attributed to two points. First, as previously mentioned, trust can only occur within the context of a social environment (Blau, 1964; Fukuyama, 1995; Gefen and Straub, 2003; Luhmann, 1979). Hassanein and Head (2007) indicates that in traditional business settings, consumer trust can be established by their assessment of seller's physical investments in geographic location, decoration and personnel, and the physical evaluation of products can be performed (based on sense of touch or smell). Though absent in an online environment, these factors can be made up with virtual community where potential buyer may seek advice from those who have already bought the product. Second, the addition of these interface features may lead to consumers' belief that the e-vendor is endeavoring to maintain vendor-client relationship and thus increase consumer trust. In other words, the incorporated web site features can be viewed as similar to sellers' physical investments in offline environments. Socially rich text and picture and virtual community may impact value perception in a way that provide additional substantial product information that is useful, helpful, and valuable in making purchase decision.

6. Conclusion

Online consumer bears the dual nature of both a traditional shopper and a web site user (Teo et al., 2003). In traditional business settings, consumers' social needs has long been recognized as a significant motivator of shopping behaviors. The social aspect of shopping has been shown to be a vital contributor to positive emotions (Jones, 1999; McGrath and Otnes, 1995), which in turn contributes to a series of benefits, for example, increased time spent in the store, increased spending and increased unplanned purchasing (Babin et al., 1994; Jones, 1999). Social motives for shopping can also be found within Internet settings (Parsons, 2002). However, currently, most e-commerce websites are low in social presence, thus keeping online shoppers from interacting with other humans. Following this perspective, past researchers calls for a need to improve social presence of e-commerce web sites (Cyr et al., 2007; Gefen and Straub, 2003; Hassanein and Head, 2006, 2007). The present study tentatively indicates that social presence may be less important; at least in this case, it is not significant in predicating online purchase intention. However, it is still worthwhile to enhance personal interaction on e-commerce websites because the addition of social interaction elements positively impacts consumer trust and perceived value (of the web site) that found to be two significant predicators of purchase intention is this study. While both are important, trust is a stronger direct predicator than perceived value.

This study confirms earlier wok stressing on the importance of trust in e-commerce settings (Bhattacherjee, 2002; Gefen, 2002; Gefen and Straub, 2003; Gefen et al., 2003; Pavlou, 2003; Pennington et al., 2003-4; Suh and Han, 2003). In response to Teo et al.'s (2003) findings that perceived value acts as a strong antecedent to attitude towards web sites, our results further reveal that it is also highly predictive of online purchase intention. This extends Kim et al.'s (2003) VAM model suggesting that consumers' perception of the value of M-Internet is a principal determinant of adoption intention to the e-commerce domain. Our findings also show that trust is a stronger direct predicator than perceived value. It provides additional empirical support for Reichheld and Schefter's (2000) proposition that trust rules the web.

Most notably, in order to enhance personal interaction in an online environment, we selected socially rich text and pictures (as suggested by Hassanein and Head (2007)) that stimulate imaginary interaction with other humans and virtual community that provides means for actual interaction with other humans. Findings from this study have revealed that the selected interface features positively impact consumer trust and perceived value of the web site, which may provide immediate and attainable recommendations for practitioners.

In this study, the positive effects of socially rich pictures on the e-commerce web site selling electronic products is inconsistent with earlier research by Hassanein and Head (2006).

This disagreement could be attributed to the factor that in our experimental web site, a product was presented using more than four emotive pictures which were displayed in the form of Flash. However, practitioners should be cautious about adopting flash because the file size of it has to be optimized for the constraints of consumers' internet bandwidth. The management of virtual community where consumers share shopping and product-use-related experience must be taken into consideration as well. For example, online vendors should develop a series of measures to avoid "spam posting" and fake information.

There are a few limitations to the present research. First, only 60 subjects participated in our study. The statistical results may be biased due to the small sample size. Second, all of the subjects are university students. Though the student groups are utilized by the majority of e-commerce studies, they are indeed constrained by a number of issues like economic conditions. Hence, generalizability of the findings to other settings is restricted. Third, though the experimental web sites were designed by professionals who have accumulated several years of experiences on e-commerce web interface design, the inherent nature of the experiment was inevitably evident to the participants. Accordingly, asking subjects to indicate their trust, perceived value and purchase intention within an artificial and experimental environment tends to be less meaningful and appropriate. As B2C e-commerce adoption is a worldwide phenomenon, future studies could be conducted across difference countries. On the other hand, research effort could be put in investigating other social web site elements such as "testimony" and other forms of user recommendation system.

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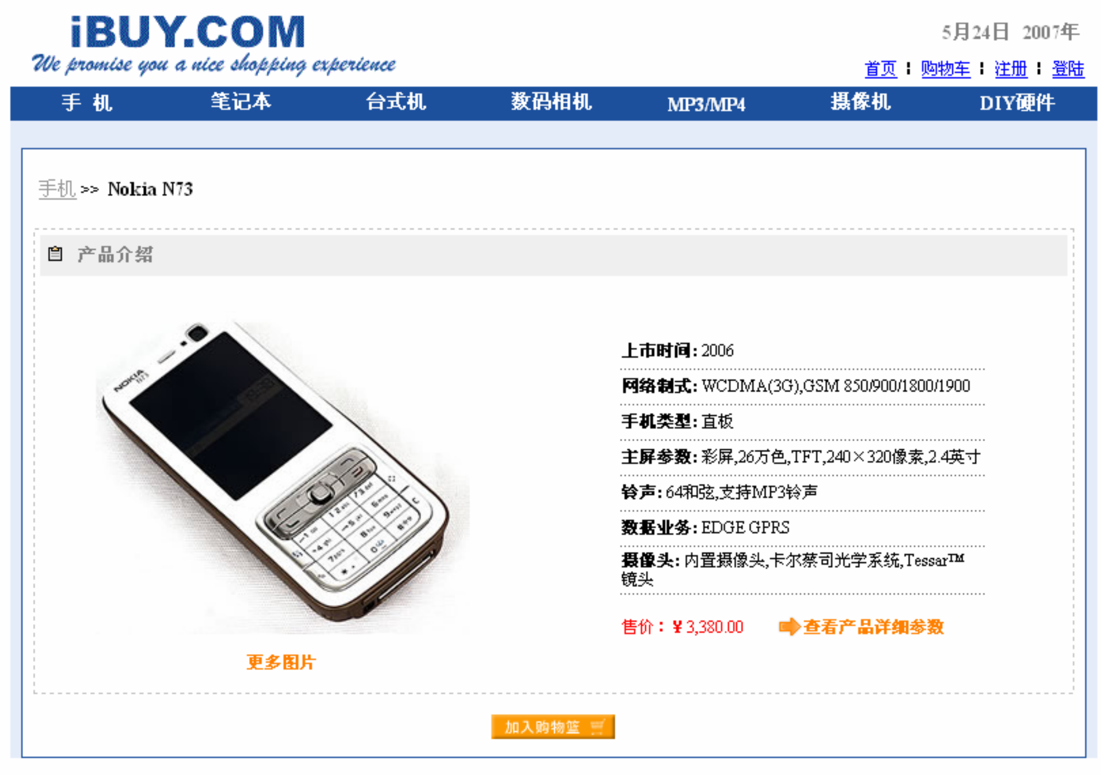
Appendix A. Snapshots of the experimental web pages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We promise you a nice shopping experience
5月24日 2007年
首页 ¦ 购物车 ¦ 注册 ¦ 登陆
手 机
笔记本
台式机
数码相机
MP3/MP4
摄像机
DIY硬件
手机 >> Nokia N73
产品介绍
更多图片
查看产品详细参数
加入购物篮

上市时间: 2006

网络制式: WCDMA(3G),GSM 850/900/1800/1900

手机类型: 直板

主屏参数: 彩屏,26万色,TFT,240×320像素,2.4英寸

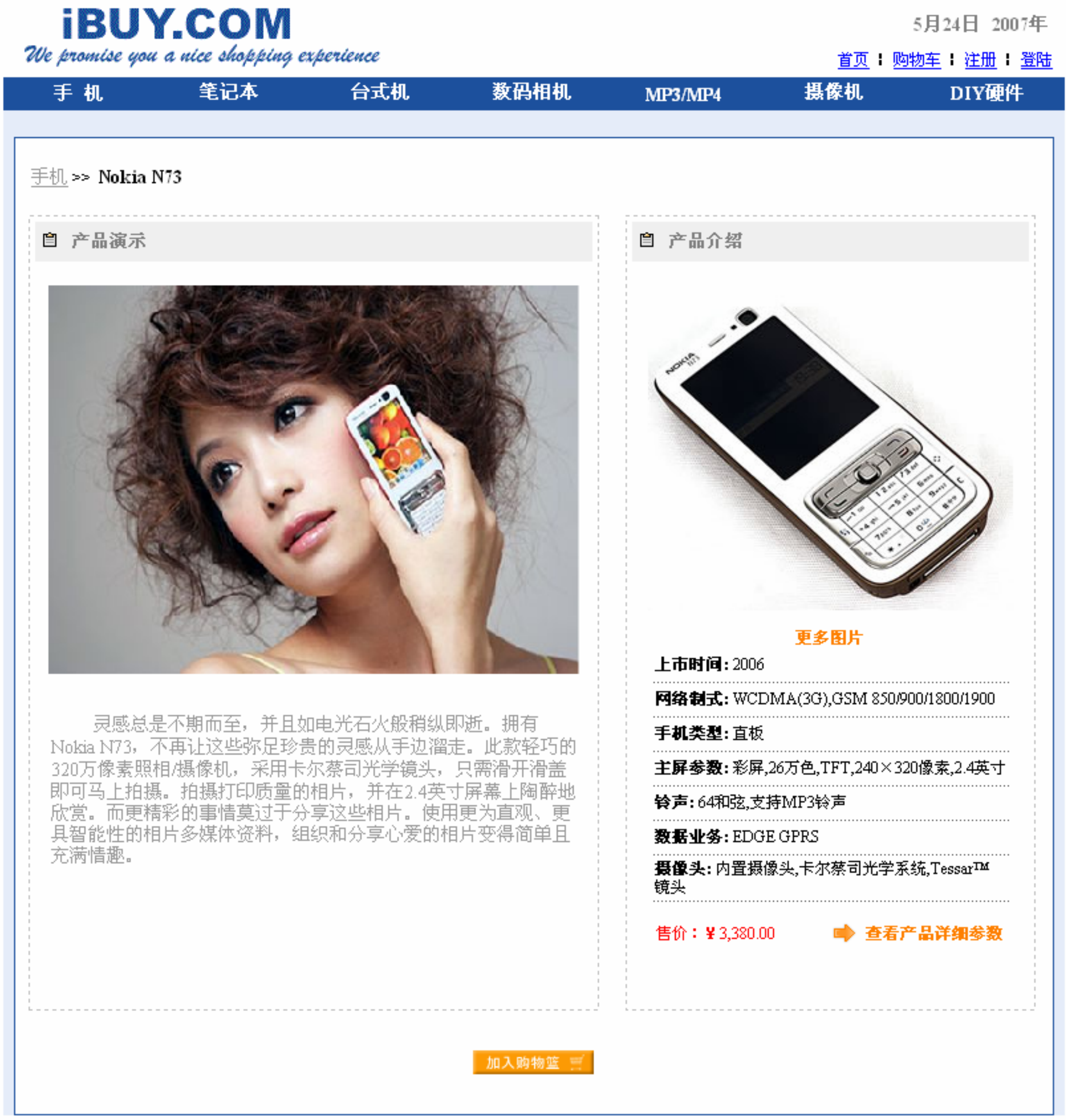
铃声: 64和弦,支持MP3铃声

数据业务: EDGE GPRS

摄像头: 内置摄像头,卡尔蔡司光学系统,Tessar™镜头

售价：￥3,380.00

PI-1 low personal interaction web site


iBUY.COM
We promise you a nice shopping experience
5月24日 2007年
首页 ¦ 购物车 ¦ 注册 ¦ 登陆
手 机
笔记本
台式机
数码相机
MP3/MP4
摄像机
DIY硬件
手机 >> Nokia N73
产品演示
产品介绍
更多图片
查看产品详细参数
加入购物篮

灵感总是不期而至，并且如电光石火般稍纵即逝。拥有Nokia N73，不再让这些弥足珍贵的灵感从手边溜走。此款轻巧的320万像素照相/摄像机，采用卡尔蔡司光学镜头，只需滑开滑盖即可马上拍摄。拍摄打印质量的相片，并在2.4英寸屏幕上陶醉地欣赏。而更精彩的事情莫过于分享这些相片。使用更为直观、更具智能性的相片多媒体资料，组织和分享心爱的相片变得简单且充满情趣。

上市时间: 2006

网络制式: WCDMA(3G),GSM 850/900/1800/1900

手机类型: 直板

主屏参数: 彩屏,26万色,TFT,240×320像素,2.4英寸

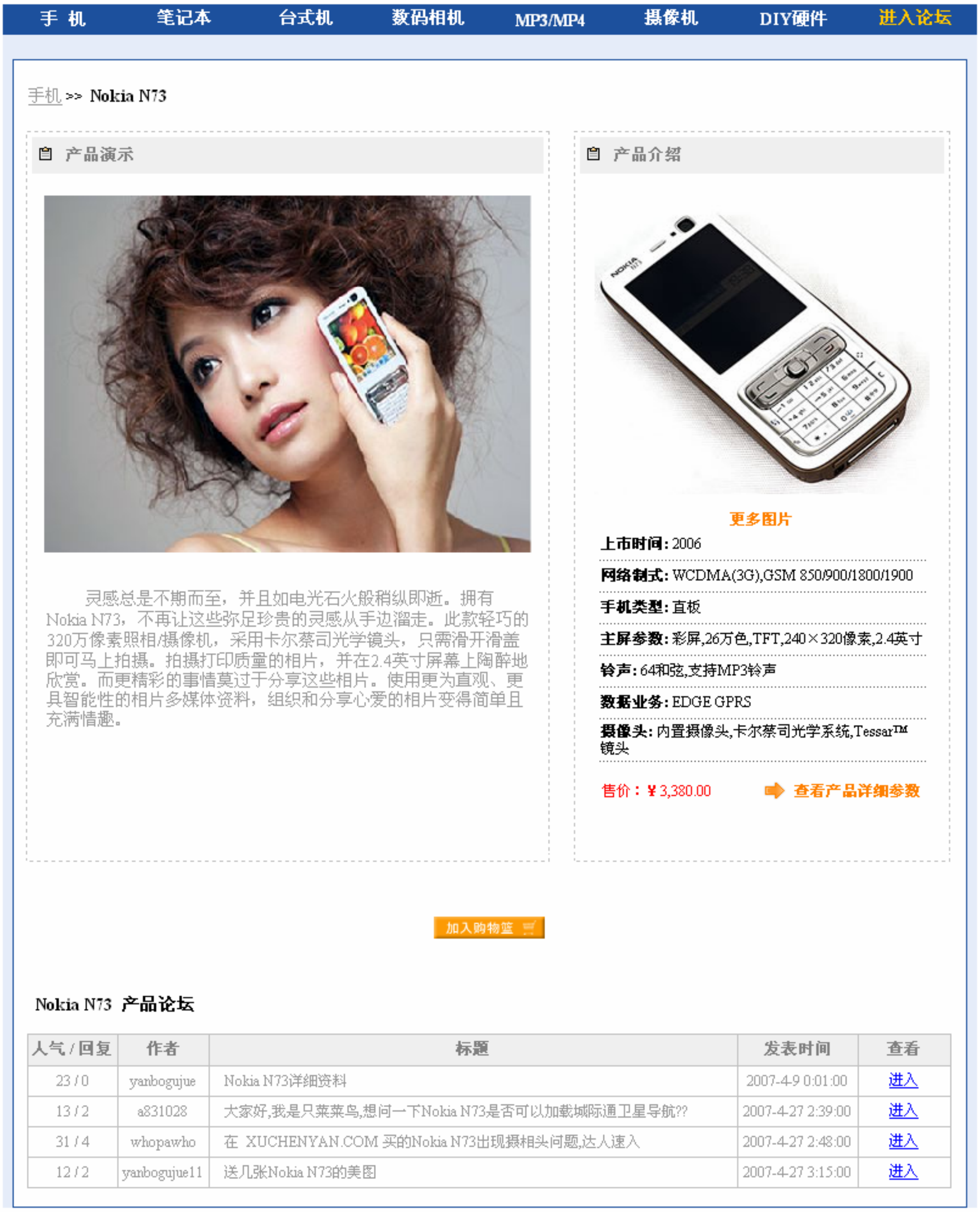
铃声: 64和弦,支持MP3铃声

数据业务: EDGE GPRS

摄像头: 内置摄像头,卡尔蔡司光学系统,Tessar™镜头

售价：￥3,380.00

PI-2 medium personal interaction web site



灵感总是不期而至，并且如电光石火般稍纵即逝。拥有Nokia N73，不再让这些弥足珍贵的灵感从手边溜走。此款轻巧的320万像素照相/摄像机，采用卡尔蔡司光学镜头，只需滑开滑盖即可马上拍摄。拍摄打印质量的相片，并在2.4英寸屏幕上陶醉地欣赏。而更精彩的事情莫过于分享这些相片。使用更为直观、更具智能性的相片多媒体资料，组织和分享心爱的相片变得简单且充满情趣。

上市时间： 2006

网络制式： WCDMA(3G),GSM 850/900/1800/1900

手机类型： 直板

主屏参数： 彩屏,26万色,TFT,240×320像素,2.4英寸

铃声： 64和弦,支持MP3铃声

数据业务： EDGE GPRS

摄像头： 内置摄像头,卡尔蔡司光学系统,Tessar™镜头

售价：￥3,380.00 查看产品详细参数

Nokia N73 产品论坛

人气 / 回复	作者	标题	发表时间	查看
23 / 0	yanbogujue	Nokia N73详细资料	2007-4-9 0:01:00	进入
13 / 2	a831028	大家好,我是只菜菜鸟,想问一下Nokia N73是否可以加载城际通卫星导航??	2007-4-27 2:39:00	进入
31 / 4	whopawho	在 XUCHENYAN.COM 买的Nokia N73出现摄相头问题,达人速入	2007-4-27 2:48:00	进入
12 / 2	yanbogujue11	送几张Nokia N73的美图	2007-4-27 3:15:00	进入

PI-3 high personal interaction web site

Appendix B. Measurement items

Social Presence		
SP1	There is a sense of human contact in the web site	**1 2 3 4 5 6 7**
SP2	There is a sense of personalness in the web site	**1 2 3 4 5 6 7**
SP3	There is a sense of sociability I the web site	**1 2 3 4 5 6 7**
SP4	There is a sense of human warmth in the web site	**1 2 3 4 5 6 7**
SP5	There is a sense of human sensitivity in the web site	**1 2 3 4 5 6 7**

Trust		
T1	Even if not monitored, I'd trust this web site to do the job right.	**1 2 3 4 5 6 7**
T2	I can trust this web site.	**1 2 3 4 5 6 7**
T3	I trust the information presented on this web site.	**1 2 3 4 5 6 7**
T4	I feel this online vendor would provide me with good service.	**1 2 3 4 5 6 7**

Purchase Intention		
PI1	I am likely to buy mobile from XUCHEYAN.COM	**1 2 3 4 5 6 7**
PI2	I am willing to buy mobile from XUCHEYAN.COM	**1 2 3 4 5 6 7**
PI3	It's possible for me to consider buying mobile from XUCHENYAN.COM	**1 2 3 4 5 6 7**

Perceived Ease of Use		
PEOU1	XUCHENYAN.COM is easy to use for mobile assessment	**1 2 3 4 5 6 7**
PEOU2	I can quickly find the information I need on this web site	**1 2 3 4 5 6 7**
PEOU3	This is a user-friendly web site	**1 2 3 4 5 6 7**
PEOU4	My interaction with this web site is clear and understandable	**1 2 3 4 5 6 7**

Perceived Usefulness		
PU1	This web site provides good quality information	**1 2 3 4 5 6 7**
PU2	This web site improves my performance in assessing mobile online	**1 2 3 4 5 6 7**
PU3	This web site increases my effectiveness for mobile assessment online	**1 2 3 4 5 6 7**
PU4	This web site is useful for assessing mobile online	**1 2 3 4 5 6 7**

Perceived Value		
PV1	This web site is useful	**1 2 3 4 5 6 7**
PV2	This web site is important	**1 2 3 4 5 6 7**
PV3	This is a user-friendly web site	**1 2 3 4 5 6 7**
PV4	This web site is valuable	**1 2 3 4 5 6 7**

Satisfaction		
S1	I feel satisfied with this web site	**1 2 3 4 5 6 7**
S2	My experience with this web site is very pleasing	**1 2 3 4 5 6 7**
S3	This web site makes me happy	**1 2 3 4 5 6 7**
S4	This web site does a satisfactory job of fulfilling my needs	**1 2 3 4 5 6 7**