

## Exploring usage continuance of e-negotiation systems: expectation and disconfirmation approach

Her-Sen Doong · Hsiangchu Lai

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**Abstract** Online negotiation is becoming increasingly popular and important due to the rapid growth of global e-business, with the factors determining the continuance of e-negotiation systems (ENSs) usage—rather than the mere acceptance of their use—receiving more attention. This study used the expectation-disconfirmation theory to investigate the factors influencing the intention of ENS usage continuance. Using two Web-based ENSs, data were collected from 170 negotiators who participated in an e-negotiation experiment lasting 17 days. A structural-equation modeling technique was adopted to examine the research model and hypotheses. The obtained research results provide novel insights into ENS usage continuance for ENS researchers, developers, and managers. They indicate that positive disconfirmation (i.e., where the actual experience or perceived performance is better than the expectation) plays a crucial role in shaping the intentions of users to continue using an ENS. Therefore, researchers should consider postusage factors when attempting to elucidate the decision-making processes that underlie the continued use of an ENS. Similarly, the development of a successful ENS requires its developers to consider the expectations of users when designing the system specification. To ensure ENS usage continuance, IS managers should continuously monitor the users' expectation-disconfirmation status to ensure their satisfaction with the ENS.

**Keywords** Expectation-disconfirmation theory · E-negotiation systems · Continuance intention · Continuance usage · User satisfaction · Negotiation support systems

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H.-S. Doong  
National Chiayi University, Chiayi, Taiwan  
e-mail: hsdoong@mail.ncyu.edu.tw

H. Lai (✉)  
National Sun Yat-sen University, Kaohsiung, Taiwan  
e-mail: hclai@mail.nsysu.edu.tw

## 1 Introduction

The rapid growth of global e-business is associated with a growing demand for online negotiations. People are increasingly using the Internet to conduct business processes such as B2B purchasing, contracting, team projects, and outsourcing more efficiently, with this becoming crucial to the work of many managers. The open-system characteristic of Internet technology makes it relatively easy to create and utilize negotiation support systems due to the user-friendly development tools and user interface of Web-based systems. This has attracted both research into and practical applications of Web-based e-negotiation systems (ENSs).

The great potential of e-negotiations has increased the importance of developing ENSs in both business and research fields. Smartsettle, Cybersettle, and TradeAccess' EcommBuilder are examples in the business field, while Inspire, Negoisst, SimpleNS, and WebNS (Yuan et al. 2003) are systems in the research field. For example, Cybersettle was first incorporated in 1996 and went online in 1998. Currently there are over 100,000 attorneys registered in the Cybersettle system, which has now been used in more than 150,000 transactions involving settlements amounting to over US\$ 1 billion. The largest online settlement facilitated by Cybersettle was for US\$ 12,500,000 (Cybersettle 2006). Similarly, Inspire has been used for both teaching and research since becoming operational in 1996 (Kersten and Noronha 1999), and has now been used by more than 6,000 people in 62 countries (Kersten 2006).

As for other types of information system (IS), the acceptance and continuance of ENSs have become important issues. Issues associated with the acceptance of negotiation support (e.g., communication support and decision support) have been explored by several researchers. For instance, Lim et al. (2002) surveyed the intentions of Singaporean companies in the adoption of negotiation support systems based on two theoretical models, the theory of planned behavior (TPB) (Ajzen 1991) and the technology acceptance model (TAM) (Davis et al. 1989), and found the intention to adopt an ENS was predicted better by the former than by the latter. Vetschera et al. (2006) investigated user assessments of Internet-based negotiation support systems based on an extended TAM, and found that evaluations of analytical components and communication components differed significantly between users. Kohne et al. (2005) examined the acceptance of the communication support feature of the Negoisst system, and confirmed that efficient communication support has a large effect on users' perceptions of negotiation support systems.

The above studies found that, in general, users have a positive attitude toward accepting ENSs. However, although the initial acceptance of ISs is an important first step toward realizing the success of ISs, their long-term viability and success depends both on their initial acceptance and continuation of their use (Bhattacharjee 2001). The initial acceptance of an IS does not guarantee the continuance thereafter, because users may reevaluate their earlier acceptance decision or experience psychological motivation changes after their initial acceptance (Rogers 1995; Bhattacharjee 2001; Bhattacharjee and Premkumar 2004). The increasing number of people negotiating via the Internet increases the importance of exploring continuation of the use of ENSs, which unfortunately has not been addressed by previous research—the purpose of this paper was to fill this vacancy.

To explore ENS continuance intention, Bhattacharjee's (2001) postacceptance model of IS continuance was used in this study. This IS continuance model is mainly derived from the expectation-disconfirmation theory (EDT) (Oliver 1980), which has been widely used in marketing researches to study consumer satisfaction and postpurchase behavior (e.g., Anderson and Sullivan 1993; Oliver 1993). Bhattacharjee (2001) argued that IS users' continuance decisions and consumers' repurchase decisions exhibit three similar characteristics: (1) they follow an initial acceptance or purchase decision, (2) they are influenced by the initial use experience, and (3) they may lead to postusage failure of the initial decision. Thus, it is justifiable to apply the EDT to an investigation of ENS continuance. Within the expectation-disconfirmation paradigm, this paper examined the following research questions: what are the salient motives underlying the intention for usage continuance of an ENS, how do these motives influence the continuance intention, how are these motives associated with each other, and how does the expectation-disconfirmation process influence the continuance intention?

The remainder of this paper is organized as follows. Section 2 discusses the EDT and its application in the IS field. Section 3 presents a conceptual research framework and five hypotheses. Section 4 describes the research methodology used to empirically test the research model, and the results of data analysis are presented in Section 5. Section 6 discusses managerial interpretations and implications. Finally, we conclude in Section 7 with our findings and limitations, and propose several future research areas.

## 2 Literature review

### 2.1 Expectation disconfirmation theory

The EDT proposed by Oliver (1980) is an extension of the cognitive dissonance theory (Festinger 1957) that is widely quoted in the social psychology literature. That EDT explored the repurchasing decisions of consumers in five stages: (1) prior to purchasing a specific product or service, consumers form an initial expectation of it, (2) they then develop perceptions of its performance from their usage of it, (3) the perceived performance and their initial expectations are compared so as to assess whether the expectation is met, (4) their satisfaction level is built according to disconfirmation, and (5) satisfied consumers may exhibit a repurchase intention while dissatisfied ones may decide not use the product or service subsequently.

In summary, the EDT depicts a process model of individual behavior whereby users form an initial preusage expectation about a product, experience its usage over time, and then form postusage perceptions of the product. The dissonance between the original expectations of users and the perceived or observed performance is captured in the disconfirmation construct. Actually, according to the argument of McKinney et al. (2002), which was based on the work of Olson and Dover (1979), disconfirmation occurs when consumer evaluations of product performance differ from their pretrial expectation about the product. McKinney et al. claimed that this is similar to the concept of expectation congruency suggested by Spreng et al. (1996). In other words, the major concept of disconfirmation is whether there is congruency

between expectation and experience without indicating whether the expectation is better or worse than the experience.

Disconfirmation thus can be positive or negative depending on whether the observed performance or perceived experience is above or below initial expectations, respectively. More specifically, the “positive disconfirmation” means that actual experience or perceived performance is better than expectation while the other way is “negative disconfirmation” (Oliver 1980; Spreng et al. 1996). The EDT is based on a greater level of positive disconfirmation being achieved if consumers experience a higher-than-expected product performance after use, which will enhance their satisfaction and continuance intention; and vice versa.

The use of the EDT has been widely reported in the consumer behavior literature in the marketing field in areas such as consumer satisfaction, postpurchase behavior, and service marketing in general (e.g., Tse and Wilton 1988; Anderson and Sullivan 1993; Spreng et al. 1996; Patterson et al. 1997; Dabholkar et al. 2000). Many studies have demonstrated the predictive ability of the EDT in a variety of product repurchase and service continuance contexts, such as automobile repurchasing (Oliver 1993), camcorder repurchasing (Spreng et al. 1996), and the use of professional business services (Patterson et al. 1997).

## 2.2 Expectation disconfirmation theory in the information system field

While the TAM has been very successful in examinations of IS acceptance (Venkatesh and Davis 2000), it is unable to explain why some users discontinue using technology after initially accepting it. This apparent discrepancy is attributable to previous studies viewing continuance as an extension of acceptance behaviors, and implicitly assuming that continuance covaries with acceptance (Davis et al. 1989; Karahanna et al. 1999). In order to examine why the initial acceptance of an IS does not guarantee continuance of use, Bhattacharjee (2001) pioneered the application of the EDT to the IS field and proposed a postacceptance model of IS continuance that integrated the EDT and the TAM. In that paper Bhattacharjee used the term “confirmation” in the same way as “positive disconfirmation” had originally been used in previous marketing researches (e.g., Oliver 1980); however, Bhattacharjee and Premkumar (2004) reverted to the use of “positive disconfirmation”. Bhattacharjee (2001) claimed that the continuance intention is determined by the satisfaction of users with their use of an IS and the perceived usefulness of continuing this usage. User satisfaction, in turn, is influenced by confirmation (i.e., positive disconfirmation) resulting from the comparison between the expectation from prior IS use and perceived usefulness. Furthermore, the postacceptance perceived usefulness is influenced by the users’ confirmation level.

The postacceptance model of IS continuance differs from the TAM in three respects: (1) the postacceptance model of IS continuance accounts for continuance behaviors, while the TAM focuses on initial acceptance only, (2) the postacceptance model of IS continuance is a theoretically richer model due to it including unique postacceptance variables (e.g., levels of positive disconfirmation and satisfaction) that are likely to predict continuance better than the preacceptance variables of the TAM (e.g., perceived usefulness and ease of use), because these postacceptance variables are temporally closer to the continuance behavior, and (3) the TAM is unable to provide a reasonable explanation for the acceptance-discontinuance

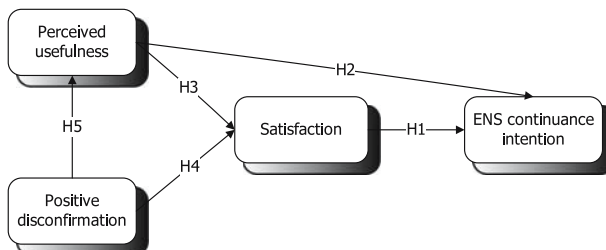
phenomenon, while the postacceptance model of IS continuance explains it by arguing that the positive disconfirmation and satisfaction with IS use may lead to a continuance intention. On the other hand, negative disconfirmation and dissatisfaction with IS use may lead to a discontinuance intention even when the perceived preacceptance variables are positive. Bhattacharjee and Premkumar (2004) also confirm the role of disconfirmation and satisfaction in controlling usefulness and belief change during the course of IS usage that, in turn, may change the subsequent IS usage behavior. They found that these emergent constructs such as disconfirmation and satisfaction may explain the temporal reversal in IS usage behavior from acceptance to discontinuance, and recommended that these constructs should be included in future process models of IS usage.

Subsequent studies have investigated issues related to the core concept of expectation disconfirmation (e.g., Au et al. 2002; Khaifa and Liu 2002; McKinney et al. 2002; Staples et al. 2002; Erevelles et al. 2003; Susarla et al. 2003). For example, in a thorough review of research on the satisfaction of end-users with ISs, Au et al. (2002) found that the research literature is dominated by the expectation-disconfirmation approach. Staples et al. (2002) used disconfirmation theory as the theoretical basis to examine the effect on users of implementing a new system; specifically, the relationship between preimplementation expectations and their perceived benefits based on the postimplementation experience. McKinney et al. (2002) used the EDT to explain the satisfaction of customers with online retailers, separately focusing on their disconfirmation with an online retailing site and the quality of information presented on that site. In an empirical study of the EDT, Susarla et al. (2003) found that negative disconfirmation has a significant negative impact on satisfaction with application service providers. Overall, these studies have shown the strong predictive ability of the EDT in different IS contexts.

### 3 Research model and hypotheses

Since the previous studies have both established the validity of the EDT in different IS usage contexts and provided preliminary evidence that continuance intention is impacted by positive disconfirmation, perceived usefulness, and satisfaction, this study employed the EDT to address its research questions. The research model with its five hypotheses is shown in Fig. 1.

The EDT states that satisfaction with a product is the primary motivation for its continuance—satisfied users will continue using an IS, while dissatisfied users will



**Fig. 1** Research model with associated hypotheses

discontinue using it. Moreover, previous studies on IS satisfaction have indicated that IS satisfaction directly effects both the intention to use and the actual use (Davis 1989; Davis et al. 1989; Karahanna et al. 1999). In addition, the postacceptance model of IS continuance proposed by Bhattacharjee (2001) also indicates that IS continuance intention is positively correlated with satisfaction. As a consequence, users' satisfaction with an ENS affects their continuance intentions. Therefore, we proposed the following hypothesis for the relationship between satisfaction and ENS continuance intention:

*H1:* The level of satisfaction of users with their initial use of an ENS is positively associated with their intention for usage continuance.

Perceived usefulness refers to individuals' perceptions that an IS will help them perform their jobs better (Davis et al. 1989). In the context of ENS, this definition can be interpreted as whether or not an ENS could assist negotiators in achieving better outcomes. According to the postacceptance model of IS continuance proposed by Bhattacharjee (2001), the following association between the intention to continue using ENSs and user's perceived usefulness is proposed:

*H2:* The intention of users for usage continuance of an ENS is positively associated with its perceived usefulness.

The postacceptance model of IS continuance proposed by Bhattacharjee (2001) posits that users' satisfaction with ISs is determined by two variables: (1) positive disconfirmation of the postusage expectation of the IS and (2) its perceived usefulness. Expectation is the user's inherent reference level in which disconfirmation is evaluated by the user to determine the level of satisfaction. Thus, disconfirmation was the perceived congruence between the expectations of using ENSs and the actual performance. In the context of an ENS, positive disconfirmation is positively associated with satisfaction if the expected benefits of using the ENS are realized. On the other hand, if the realized benefit of usage is below the expected level (i.e., negative disconfirmation), the user will be unsatisfied with the ENS. In addition, several studies have suggested that perceived usefulness is a key factor that influences IS usage and satisfaction (e.g., Davis et al. 1989). This led to the following two hypotheses:

*H3:* The usefulness of an ENS as perceived by users is positively associated with their satisfaction with the ENS.

*H4:* The level of positive disconfirmation of users is positively associated with their satisfaction with an ENS.

As in the postacceptance model of IS continuance, expectation disconfirmation affects not only the satisfaction but also the perceived usefulness. In the context of an ENS, for example, users may have low initial perceptions of the usefulness of ENSs because they are unsure as to what to expect from the usage thereof. Such perceptions may increase due to a positive disconfirmation experience. Based on cognitive dissonance theory (Festinger 1957), users may experience cognitive dissonance if their preacceptance usefulness expectations are disconfirmed during actual usage. Rational users may try to remedy this dissonance by modifying their

usefulness perceptions in order to make them more consistent with reality. In other words, positive disconfirmation will tend to elevate the level of usefulness perceived by users, and vice versa for negative disconfirmation. Therefore, we proposed the following hypothesis:

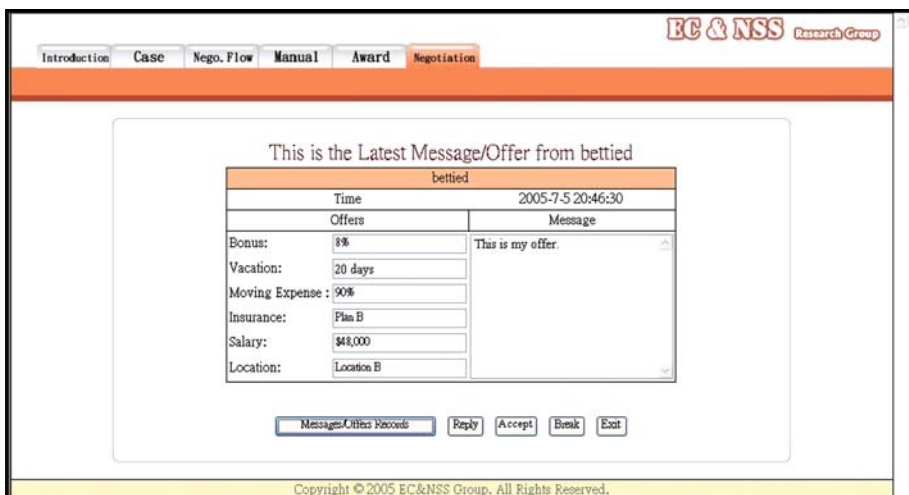
*H5:* The level of positive disconfirmation of users is positively associated with the perceived usefulness of an ENS.

## 4 Research methodology

### 4.1 Data collection

Both synchronous and asynchronous Web communication tools have increased in popularity. Messengers provided by AOL, Yahoo, MSN and Skype are popular synchronous communication tools, while email and bulletin boards are asynchronous communication tools. Since communication is one of the major functions of ENSs, both asynchronous ENSs (see Fig. 2) and synchronous ENSs (see Fig. 3) could be useful in the Internet age. For the present study, two Web-based ENSs (one synchronous, one asynchronous) were developed by National Sun Yat-sen University, both of which allow users to attach text messages to offers or exchange messages without offers.

Empirical data were collected from an online experiment in which the subjects negotiated with their opponents using the two Web-based ENSs. The negotiation case was a job negotiation between job hunter and job recruiter that involved six negotiation issues: salary, bonus, vacation time, moving-expenses coverage, insurance coverage, and location. Each issue had five options, each of which provided a different utility to the subject. The subjects were also informed that there was an alternative if they could not reach a good deal: for a job hunter, the alternative was another available job; while for a job recruiter, there was another candidate.



**Fig. 2** Web-based asynchronous ENS

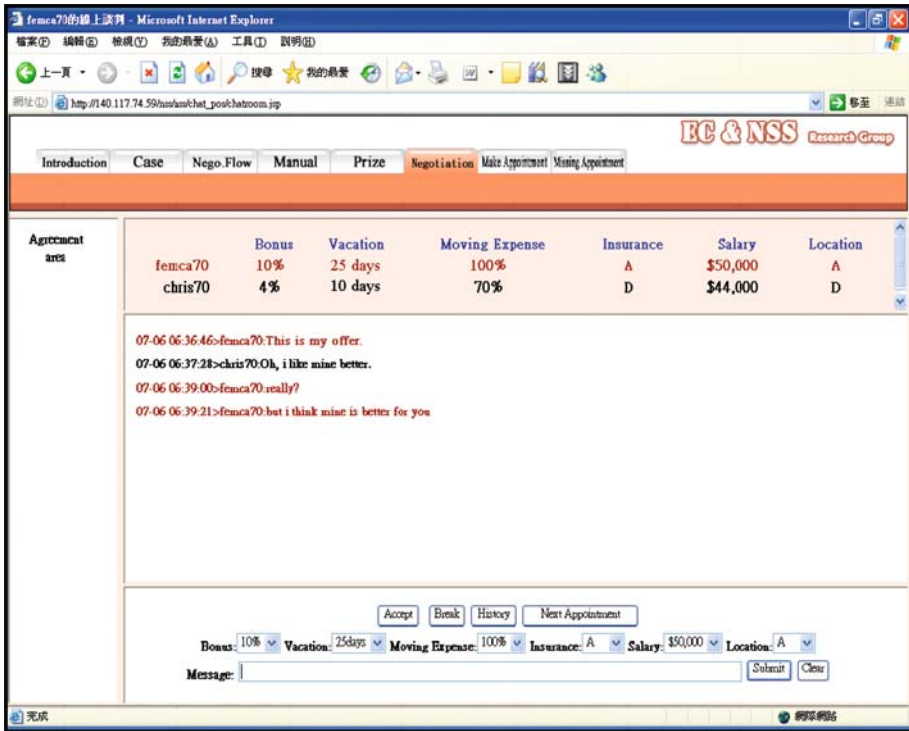


Fig. 3 Web-based synchronous ENS

A job interview was chosen as the negotiation case because the prevalence of job hunting and recruiting via a third party (e.g., monster.com) over the Internet is increasing. It is usual for job hunters and job recruiters to interact with each other through such a third-party system, email, Skype, or even video conference over the Internet, and therefore the job-interview case is eminently suitable for investigating ENS continuance intention from the standpoint of either job hunters or job recruiters. Moreover, given that the negotiation performance may vary with the case-related domain knowledge of the negotiators, we recruited MBA students and employed persons (rather than undergraduate students) as the subjects in order to minimize interference from the subjects' level of case-related domain knowledge.

All subjects were assigned randomly to the two ENSs so as to control the variables of age, gender, working experience, and negotiation experience. Negotiations were conducted over a maximum of 17 days, with the subjects able to terminate the negotiation at any time. During this period the subjects had free access to the ENS to continue negotiations. For the group using the synchronous system, they had to make an appointment for the next negotiation whenever they finished a negotiation session. During the 17-day period, the subjects accessed and used the systems repeatedly, and were able to answer the questionnaire about ENS continuance intention.

To motivate subjects to negotiate seriously, all subjects who finished the entire experimental process were offered the chance to join a lottery draw that included two substantial prizes (a SONY PSP and an iPod Shuffle) and 100 small prizes



(convenience store coupons with a value of US\$ 3). Only the top 50 subjects with the best performance (in terms of utility) were qualified to join the lottery draw of the two substantial prizes. Once the two winning subjects were selected, all the other 48 subjects were given the small prizes, with the remaining 52 small prizes given to the other subjects based on the results of a lottery draw. Performance-based prizes were designed to encourage serious decision-making, while fortune-based prizes were designed to encourage participation. The subjects had to fill out different questionnaires at three stages of the experiment. In the first questionnaire, each subject had to provide demographic data and information about their negotiation experience. The subjects then read the negotiation case and subsequently filled out the second questionnaire about their expected negotiation outcome. Finally, whenever a negotiation was completed, the subjects completed the last questionnaire on their perception of the ENS.

The above process yielded 170 valid data sets (i.e., 85 dyads) for analysis. An overall profile of the subjects is given in Table 1. The subjects comprised 63 MBA students and 107 employed persons (115 males, 55 females; mean age 31.7 years), of which 152 had prior negotiation experience and 146 had experience of performing e-negotiations via an electronic communication channel (e.g., email, messengers, or Inspire). The mean number of offers was 3.3 for those using the asynchronous ENS, 6.3 for those using the synchronous ENS, and 4.9 for all subjects. Among the 85 dyads, 52 (104 subjects) reached agreement, with 23 and 29 dyads using the asynchronous and synchronous ENSs, respectively. The mean utility of the total agreed negotiations was 2826.9: 2517.4 and 3072.4 for the asynchronous and synchronous ENSs, respectively.

#### 4.2 Instrument construction

Four constructs were developed in this study: positive disconfirmation, perceived usefulness, satisfaction, and ENS continuance intention. These constructs were measured on seven-point Likert scales ranging from “strongly disagree” to “strongly agree.” Scale items were drawn from previously validated IS or EDT literature and modified to relate them to the specific context of using ENSs. For each construct,

**Table 1** Profiles of all the study subjects

System		Asynchronous	Synchronous	Total
Attribute				
Gender	Male	47 (59%)	68 (76%)	115 (68%)
	Female	33 (41%)	22 (24%)	55 (32%)
Occupation	MBA student	27 (34%)	36 (40%)	63 (37%)
	Employed	53 (66%)	54 (60%)	107 (63%)
Age (years)		32.9	30.6	31.7
Offers (number)		3.3	6.3	4.9
Previous negotiation experience	Yes	71 (89%)	81 (90%)	152 (89%)
	No	9 (11%)	9 (10%)	18 (11%)
E-negotiation experience	Yes	66 (83%)	80 (89%)	146 (86%)
	No	14 (17%)	10 (11%)	24 (14%)
Agreement reached	Yes	46 (58%)	58 (64%)	104 (61%)
	No	34 (42%)	32 (36%)	66 (39%)
Utility (for agreed negotiations only)		2517.4	3072.4	2826.9

**Table 2** Summary of scale items

Construct	Measurement items	Source
Perceived usefulness	Using the ENS improves the performance of my negotiation	Adapted from Davis et al. (1989)
	Using the ENS improves the process of my negotiation	
	Using the ENS increases my negotiation efficiency	
Positive disconfirmation	Overall, the ENS is useful for negotiation	Adapted from Bhattacherjee (2001)
	The performance level provided by the ENS was better than I had expected	
	My experience with using the ENS was better than I had expected	
Satisfaction	Overall, most of my expectations about using the ENS were confirmed	Adapted from Spreng and Olshavsky (1993)
	Using the ENS makes me feel very pleased	
	Using the ENS makes me feel very satisfied	
ENS continuance intention	Using the ENS makes me feel very delighted	Adapted from Bhattacherjee (2001)
	I intend to continue using the ENS rather than discontinuing its use	
	I intend to continue using the ENS rather than any alternative means	
	I would like to continue using the ENS when I have to negotiate	

at least three items were included for adequate reliability, as recommended by Nunnally (1978).

The perceived usefulness refers to the expected benefits that users perceive that they will obtain from ENSs. Scale items were adapted from the three-item measure of ISs proposed by Davis et al. (1989), to which a fourth item was added (the perception of overall usefulness). Positive disconfirmation is a cognitive belief derived from the use of ENSs that refers to the extent to which ENS's performance outperforms users' expectations. It was quantified using a measurement scale comprising three items taken from Bhattacherjee (2001) and was appropriately reworded to fit the context specific to ENSs. The satisfaction scale measured users' feelings about using ENSs, and was adapted from the three-item measurement of Spreng and Olshavsky (1993). Finally, continuance intention indicates the intention of users to continue using ENSs, and the original scale developed by Bhattacherjee (2001) was modified to fit the context specific to ENSs.

The initial version of the instrument used in this study was pretested for content validity by two professors as expert judges. The wording of each individual item was examined, and unclear items were reworded where necessary. Table 2 lists the scale items for these constructs.

## 5 Data analysis and results

The data obtained in this study were analyzed using LISREL 8.52. LISREL is a structural equation modeling tool, where the covariance structure derived from observed data is used to simultaneously fit measurement equations and structural equations specified in the model. In this study, the maximum likelihood approach was used for model estimation. To assess the measurement items and research model

and hypotheses, the measurement model was first examined, and then the structural equation model was analyzed so as to test the fit between the model and the proposed hypotheses.

### 5.1 Measurement model

The scale validation was examined by analyzing the goodness-of-fit using overall confirmatory factor analysis (CFA). Bentler (1989) suggested that the value of chi-square normalized by the degrees of freedom ( $\chi^2/\text{df}$ ) should be less than 5, and that NNFI, NFI, GFI, and CFI should all exceed 0.9. In this study,  $\chi^2/\text{df}$  was 1.73 ( $\chi^2 = 98.86$ ,  $\text{df} = 57$ ), NNFI was 0.99, NFI was 0.98, CFI was 0.99, and GFI was 0.91 (see Table 3), indicating an adequate fit between the measurement model and the observed data.

The construct validity of each scale was assessed by evaluating the standardized CFA factoring loadings of hypothesized items. Fornell and Larcker (1981) suggested three criteria: (1) all indicator factor loadings ( $\lambda$ ) should exceed 0.7 and be significant at the  $P = 0.01$  level, (2) construct reliabilities should be at least 0.8, and (3) the average variance extracted (AVE) should exceed the variance due to the measurement error for that construct (i.e., AVE should exceed 0.5). In this study, all  $\lambda$  values in the CFA model exceeded 0.7 and were significant at  $P = 0.001$  (see the  $t$ -values given in Table 3). The composite reliabilities ranged from 0.74 to 0.94. AVE ranged between 0.64 and 0.79 (see Table 4), which is greater than the variance due to measurement error. Hence, all three conditions for convergent validity were confirmed. Finally, Fornell and Larcker (1981) suggested a stronger test of discriminate validity, where the AVE for each construct should exceed the squared correlation between this construct and any other construct. The factor correlation matrix in Table 4 indicates that the largest squared correlation between any pair of constructs was 0.62 (positive disconfirmation and satisfaction; continuance intention

**Table 3** Measurement model

Item	Item mean	Standard deviation	Standardized item loading	Error loading	$t$ statistic (for $\lambda$ ) <sup>a</sup>
PU1	4.39	1.34	0.88	0.22	14.22
PU2	4.56	1.27	0.81	0.34	12.36
PU3	4.54	1.31	0.85	0.28	13.28
PU4	4.79	1.29	0.91	0.17	15.09
DC1	4.29	1.38	0.88	0.22	14.41
DC2	4.46	1.40	0.94	0.12	15.93
DC3	4.48	1.39	0.84	0.29	13.33
SA1	4.47	1.27	0.80	0.36	12.31
SA2	4.29	1.36	0.87	0.24	14.17
SA3	4.42	1.34	0.94	0.12	15.99
CI1	4.36	1.39	0.74	0.45	11.03
CI2	4.59	1.66	0.75	0.46	11.07
CI3	4.51	1.66	0.90	0.18	14.77

*Note:* PU = Perceived usefulness, CI = ENS continuance intention, SA = Satisfaction, DC = Positive disconfirmation

*Model fit:*  $\chi^2 = 98.86$  ( $\text{df} = 57$ ,  $P < 0.001$ ), NFI = 0.98, NNFI = 0.99, CFI = 0.99, GFI = 0.91

<sup>a</sup> All item loadings (for  $\lambda$ ) are significant at the  $P = 0.001$  level

**Table 4** Scale properties and correlations

Construct	Number of items	Composite reliability <sup>a</sup>	AVE <sup>b</sup>	Factor correlations <sup>c</sup>			
				DC	PU	SA	CI
DC	3	0.92	0.79	0.92			
PU	4	0.92	0.75	0.63	0.93		
SA	3	0.90	0.76	0.79	0.67	0.90	
CI	3	0.84	0.64	0.69	0.68	0.79	0.84

<sup>a</sup> Reliability was computed as  $(\sum\lambda)^2/[(\sum\lambda)^2 + \text{Var}(\varepsilon)]$ , where the  $\lambda$  and  $\varepsilon$  estimates are provided in Table 3

<sup>b</sup> AVE was computed as  $(\sum\lambda^2)/[(\sum\lambda^2) + \text{Var}(\varepsilon)]$

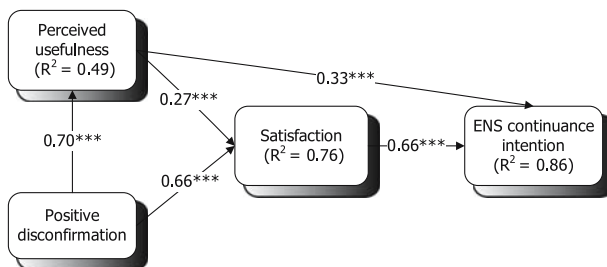
<sup>c</sup> Alpha internal reliability coefficients (Cronbach's alpha) for the multiple-item scales are on the main diagonal

and satisfaction), while the smallest AVE was 0.64. Therefore, the discriminate validity was also confirmed.

### 5.2 Model fit and hypotheses testing

Before testing the five hypotheses proposed in this study, the fit of the hypothesized research model (Fig. 1) was examined. Our adoption of the structural equation model is appropriate for areas with a strong a priori theory, where theory testing is the research goal (Bentler and Bonett 1980), as was the case in the present study. The first step in model testing was to estimate its goodness-of-fit.  $\chi^2/df$  and the goodness-of-fit measures of NFI, NNFI, and CFI were assessed. As recommended by Bollen (1989), a  $\chi^2/df$  value of less than 3 was considered indicative of an acceptable goodness-of-fit between the hypothesized research model and the observed data. In the hypothesized model of this research,  $\chi^2/df$  ratio was estimated as 1.72 ( $\chi^2 = 99.77$ ,  $df = 58$ ), and NFI, NNFI, and CFI were 0.98, 0.99, and 0.99, respectively, indicating an adequate fit between the hypothesized model and the observed data.

After the good fit of the hypothesized model had been verified, the path significance of each association in the research model and the variance explained by it was examined. Figure 4 shows the standardized path coefficients and path significances, indicating that all of the hypothesized associations were strongly significant at  $P < 0.001$ . As postulated in this study, satisfaction was the strongest predictor of an intention for usage continuance of an ENS ( $\beta = 0.66$ ,  $P < 0.001$ ), followed by perceived



**Fig. 4** LISREL analysis results for the research model. Model fit:  $\chi^2 = 99.77$  ( $df = 58$ ,  $P < 0.01$ ), NFI = 0.98, NNFI = 0.99, CFI = 0.99, GFI = 0.91. \*\*\*Path significant at the  $P = 0.001$  level

usefulness ( $\beta = 0.33$ ,  $P < 0.001$ ), which together explained 86% of the variance in the intention for usage continuance of ENSs. Hence, hypotheses H1 and H2 were supported. In turn, positive disconfirmation and perceived usefulness have significant impacts on satisfaction, with path coefficients of 0.66 ( $P < 0.001$ ) and 0.27 ( $P < 0.001$ ), respectively, which together accounted for 76% of the satisfaction variance. Therefore, hypotheses H3 and H4 were also supported. Furthermore, positive disconfirmation also has a significant effect on perceived usefulness ( $\beta = 0.70$ ,  $P < 0.001$ ) and could explain 49% of the perceived usefulness variance, thereby supporting hypothesis H5.

## 6 Interpretation and managerial implications

### 6.1 Antecedents of continuance intention

The analyses in Section 5 revealed the antecedents of the intention for usage continuance of ENSs and the path relationships between these antecedents, with satisfaction being the strongest predictor of users' intention to continue using ENSs. This combined with the second significant (but weaker) predictor, perceived usefulness, explained 86% of the variance in the continuance intention. That is, satisfaction was more dominant in the intention for usage continuance of ENSs. However, the perceived usefulness not only indirectly influences the continuance intention via its effect on the satisfaction but also has a direct impact on continuance intention.

Positive disconfirmation also influences the intentions for usage continuance of ENSs in two indirect ways: (1) by influencing users' satisfaction with the ENSs and (2) by impacting the usefulness of ENSs as perceived by users. The above overall relationships between continuance intention and its antecedents indicates that increasing the users' positive disconfirmation and perceived usefulness are critical factors in increasing users' willingness to continue using ENSs.

### 6.2 Associations between antecedents of continuance intention

The testing of the five hypotheses revealed that there are significant positive associations between satisfaction and continuance intention, between perceived usefulness and continuance, between perceived usefulness and satisfaction, between positive disconfirmation and satisfaction, and between positive disconfirmation and perceived usefulness. Moreover, several subtle associations exist among these constructs. First, positive disconfirmation influences users' satisfaction with the ENSs both directly and indirectly, where the indirect path is via its impact on the perceived usefulness (path coefficient of 0.70,  $P < 0.001$ ). Second, 76% of the satisfaction variance was explained by perceived usefulness ( $\beta = 0.27$ ,  $P < 0.001$ ) and positive disconfirmation ( $\beta = 0.66$ ,  $P < 0.001$ ), and the satisfaction and the perceived usefulness together impacted the continuance intention. Therefore, compared with perceived usefulness, positive disconfirmation is a stronger predictor of satisfaction.

### 6.3 Implications

The above analysis results support our expectation that satisfaction and perceived usefulness are strong predictors of users' intention to continue ENS usage.

Compared with TAM-based studies, satisfaction was a stronger predictor of continuance intention in this study than perceived usefulness, which was a stronger predictor of acceptance intention than attitude. These observations have important implications for the implementation of ENSs, in that postusage satisfaction cannot be ignored. Instead, satisfaction should be continuously monitored after implementing an ENS. It is also important to identify dissatisfied users and attempt to address their dissatisfaction concerns before they actually discontinue.

Perceived usefulness was identified as a secondary determinant of the intention for usage continuance of ENSs. A positive use-performance relationship would result in continuance of using ENSs. Users want to continue using ENSs only if they find that the systems actually are useful. However, users may not recognize all of the benefits due to their limited experience of using the systems and/or a lack of negotiation knowledge. Therefore, to ensure usage continuance, it is important to educate users about both the potential benefits of ENSs and the negotiation process.

The overall relationships between continuance intention and its antecedents indicates that increasing the users' positive disconfirmation level and perceived usefulness are critical factors in increasing users' willingness to continue using ENSs. Positive disconfirmation might be more fundamental than perceived usefulness, since it also impacts perceived usefulness directly. Because disconfirmation is derived from the comparison between the postusage expectation and users' experiences, providing users with good experiences of using ENSs and educating them about appropriate expectations are both very important. Disconfirmation remains a new concept in the ENSs field, and hence how to satisfy the users' expectations of ENSs remains a challenging task, since a high expectation may lead to negative disconfirmation while a low expectation may reduce users' motivations to continue using ENSs.

Since ENSs are used for diverse purposes, system developers should differentiate user types and provide differential features (e.g., communication support, decision support, and analytical support) and services. For example, ENS developers could define target users and satisfy them with specifically desired functions. It is also important to educate users about appropriate expectations and how to operate ENSs effectively so as to maximize their positive disconfirmation. In summary, understanding users' service needs and capabilities and then designing different features for each aspect are critical to the success of ENSs.

## 7 Conclusions and future direction

Negotiation via the Internet is becoming crucial to the work of managers due the rapid growth of global e-business, and ensuring the intention for usage continuance of ENSs rather than acceptance only is becoming increasingly important. This study was designed to elucidate the motives influencing the intention for usage continuance of ENSs by applying the postacceptance model of IS continuance proposed by Bhattacharjee (2001) and the underlying EDT. An understanding of these factors will help us to determine the factors that must be designed into an ENS so as to ensure that users continue using it and to improve users' negotiation abilities.

The research results provide novel insight into usage continuance of ENSs. First, the expectation-disconfirmation model explained significant proportions of the variances in continuance (86%), satisfaction (76%), and perceived usefulness (49%)

of using an ENS. Hence, our findings generally support the results of previous studies based on the EDT (Bhattacharjee 2001; McKinney et al. 2002; Bhattacharjee and Premkumar 2004; Hsu et al. 2004; Lin et al. 2005). This demonstrates that the expectation-disconfirmation paradigm is useful in explaining the intention for usage continuance of ENSs. Furthermore, it indicates that the expectation-disconfirmation factor plays a very important role in shaping the intentions for usage continuance of ENSs. Therefore, ENS researchers should consider postusage factors when exploring users' decision-making processes underlying continued use of ENSs, and ENS developers should attempt to satisfy the expectations of users. Any negotiations involving an ENS should involve the continuous monitoring users' disconfirmation status and satisfaction.

Our findings have meaningful implications for ENS continuance, but are subject to a few limitations. First, the effects of determinants such as positive disconfirmation, satisfaction, and even the perceived usefulness in the research model may change over time as the experience of users increase, whereas the collected cross-section data may not reflect such long-term phenomena. Future studies should therefore collect longitudinal data to validate this aspect of the research model in the ENS context. Second, our study demonstrated the importance of positive disconfirmation to the continued use of ENSs. However, conceptualizing disconfirmation is not easy in the ENS context. Thus, it is important to identify the components that are critical to the formation of users' perceived disconfirmation (McKinney et al. 2002), especially in the ENS field. Future studies should apply the related theories to decomposing this critical construct in order to obtain a better understanding of how disconfirmation affects the usage continuance of ENSs. Third, given the impact of demographic background on negotiation (Walters et al. 1998), future studies would benefit from gender, age, prior negotiation experience, and e-negotiation experience being tested statistically. Moreover, the EDT is a theoretically rich model since it investigates the postacceptance behavior, which is widely studied in the consumer-behavior literature. Future studies could extend the EDT by integrating it with other theories such as the media richness theory. These refinements of the EDT for the context specific to ENSs would provide new and useful insight into ENS continuance.

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