Bridging indistinct relationships and online loyalty: evidence from online interest-based communities

Chun-Der Chen
Ming Chuan University, Taipei, Taiwan, and
Edward C.S. Ku
National Kaohsiung University of Hospitality and Tourism, Kaohsiung, Taiwan

Abstract
Purpose – Bridging indistinct relationships and online loyalty has become an important strategy for online interest-based communities’ operators and firms. The objective of this study is to draw on the elaboration likelihood model (ELM) to advance our understanding of the influences on the development of relationship quality and the consequent impact on members’ loyalty to online communities.

Design/methodology/approach – To test the hypotheses the authors identified and selected four interest-based online communities in Taiwan. The online survey yielded 331 completed questionnaires from members of interest-based online communities and the authors analysed the results using the structural equation modelling approach.

Findings – The findings show that argument quality and source credibility positively affect members’ perceived relationship quality, which has a positive and significant effect on behavioural loyalty, and personal relevance and user expertise positively moderate the relationship between argument quality and relationship quality and negatively moderate the relationship between source credibility and relationship quality.

Research limitations/implications – While this study has produced meaningful insights for investigating the informational processing influences on relationship quality and subsequent behavioural loyalty through the ELM perspective, the samples may not allow researchers to draw more general conclusions across different types of community contexts. The data were collected only from interest-based communities. Examining this model across different types of online communities, such as transaction-, relationship-, or fantasy-based ones, would help establish the generalisability of these results beyond the current context.

Practical implications – The present study can help managers of online communities recognise the differential effects of these information processes across a user population and customise optimal strategies that best fit the unique characteristics of their community members. For making argument quality more convincing, Toulmin’s (1958) model of argumentation could serve as an appropriate mechanism. Moreover it is crucial to provide various indicators of source credibility for information content.

Originality/value – The paper addresses a gap in the research by using ELM to better understand the influences on the development of relationship quality and the impact on members’ loyalty. Understanding these dynamics is critical since it: enriches the relationship marketing and information management literature by addressing the role of information content in the management and success of online communities; helps online community managers customise optimal strategies for their members, thereby fostering members’ loyalty and their platform’s competitive advantage; and illuminates two influential processes that can achieve the desired attitude change in the context of online communities.

Keywords Online community, Customer loyalty, Consumer behaviour, Elaboration likelihood model, Relationship quality, Source credibility

Paper type Research paper
Introduction

Online interest-based communities provide content on specific topics and discussion forums for people to share opinions and interact, thereby offering new ways for companies to promote deep relationships, improve the creation and synthesis of knowledge for products and services, and even generate more commercial transactions and ad revenue (Chu and Chan, 2009). Such communities are based on shared enthusiasm for an issue or an activity; they possess and exchange knowledge concerning specific product domains and often are virtual meeting places for innovative users to discuss opportunities for new products and ideas for product improvement. Although online interest-based communities can attract a large number of people who become committed to them, it has been found that online firms and vendors fail to instil significant commitment among their customers through online communities (Chou, 2011; Chiu et al., 2011; Shin, 2010; Lin et al., 2008). Thus, bridging indistinct relationships and online loyalty has become an important strategy for online interest-based communities’ operators and firms.

Previous studies have argued that interest-based communities and communities of practice can be identified for discussion communities (Tang and Yang, 2005); they have increasingly acknowledged that the social interaction supported by technology is crucial to the success of online interest-based communities, that members often prototype novel sports-related products, and that they receive assistance in developing their innovations from fellow community members (Franke and Shah, 2003). They have thus suggested that investment in community-building infrastructure has a positive effect on the future loyalty intention of highly relational patrons.

Commitment to an online community is characterised by the members’ helping behaviour and active participation (Sanchez-Franco and Martin-Velicia, 2011; Royo-Vela and Casamassima, 2011); it has an impact on potential users’ relationship quality (Chang and Wang, 2011; Liu et al., 2011; Chiu et al., 2011; Ho and Oh, 2009). Likewise long-term relationships with customers are important for organisational success (Casalo et al., 2007). To gain a competitive advantage firms must pool marketing resources and develop reliable long-term relationships with their customers.

Online communities recognise their characteristics of relationship formation, emotional commitment, and shared interests/goals while adding such specific functions as facilitating economic exchanges and exploring new identities in fantasy communities (Kannan et al., 2000). In online computer-mediated communication media, the most valuable resources are the member-generated content and recommendations within those platforms (Jin et al., 2010); the information co-created by users significantly influences relationship quality and loyalty development. Thus the objective of this study is to draw on the elaboration likelihood model (ELM) to advance our understanding of the influences on the development of relationship quality and the consequent impact on members’ loyalty to online communities.

In this study we investigate the role of two information-processing routes – the central route (argument quality) and the peripheral route (source credibility) – in motivating members’ relationship quality. Understanding the dynamics of information-processing routes related to the development of relationship quality is critical for theoretical and practical reasons since such information could enrich the relationship marketing and information management literature by addressing the
important role of information content in the management and success of online communities. We primarily focus on interest-based communities where groups of people can access information or share mutual interests in several topics. Moreover, we argue that the extent to which argument quality and source credibility will influence the formation of relationship quality is moderated by two factors: members’ perceived personal relevance and user expertise.

This paper proceeds as follows. The second section reviews background theoretical foundations from previous literature and advances the research model and hypotheses. The third section details the research method used to test the proposed model, and the fourth section presents the analysis and results of the study. The fifth section discusses our research findings; finally the sixth section concludes with the limitations and implications of the study and potential topics for future research.

Theoretical background and hypotheses

Online communities

Since an online community is a social network that uses computer support, rather than face-to-face interaction, for its communications (Shin, 2010), some communities exist purely in cyberspace. The ability of an online community to attract and retain members has also received the attention of online firms and vendors (Chiu et al., 2011), who find the virtual community useful for developing deeper and broader relationships with their customers.

Armstrong and Hagel (1996) identified four distinct categories of online communities that are relevant to practitioners and researchers. The first is interest-based communities, which form around a common theme or interest in a specific topic and allow users to access information or communicate with one another (Chu and Chan, 2009). Research has shown that innovation-related information and assistance, as well as the innovations themselves, are freely shared within these communities (Franke and Shah, 2003). The second category is transaction-based communities, which focus primarily on consumption-related transaction activities, bringing sellers and buyers together (Wu et al., 2010). Previous research has stated that social identity and group norms have significant effects on user participation (Joia, 2002; Zhou, 2011). The third is relationship-based communities, in which people can contact other people and develop meaningful real-life or business relationships (Hersberger et al., 2007); relationship-based communities are aligned with the basic building blocks of community (McMillan, 1996). The fourth category is fantasy-based communities, which usually refers to online games or virtual worlds in which people come together for fantasy or entertainment experiences (Armstrong and Hagel, 1996). According to Muniz and O’Guinn (2001) any type of community is characterised by the following three core elements: a consciousness of kind, the presence of shared traditions, and a sense of moral obligation to the collective. In the real world many popular online communities continue to evolve, often combining multiple purposes to satisfy users’ different needs. While the members of online communities do provide knowledge (Ku, 2011), participation in an online community also presupposes the formation of relationships, long-term social interactions, and shared values and norms.

Previous research has distinguished the behaviour of internet browsers as either goal-directed or experiential (Janiszewski, 1998; Novak et al., 2003). In goal-directed
searches the consumer has a planned purchase in mind and employs search routines that aid in gathering specific product information (Sánchez and Roldán, 2005); exploratory search behaviour is characterised by stimulus-driven and undirected searching. Varied motivation to browse would affect the degree of concentration of the user, affecting the flow experience and in turn influencing transaction intentions. From the perspective of online shopping, in goal-directed search, consumers may decide to make the purchase once the accumulated product information satisfies their need (Bigné-Alcañiz et al., 2008), while in exploratory search, the information gathered could assist in a future purchase decision or in augmenting product knowledge.

**Elaboration likelihood model**

To gain a better understanding of how consumer attitudes form and change, Petty and Cacioppo (1981) developed the ELM to represent a general framework for understanding how an individual deals with various appeals and the effectiveness of persuasive communications. The ELM embraces a process-oriented, rather than a variable-oriented, approach to persuasion (Royo-Vela and Casamassima, 2011). It allows the same variable to induce different behaviours at different stages of the persuasion process, making it possible to explain the mixed results of previous studies using a single theoretical framework (Tam and Ho, 2005; Te’eni-Harari et al., 2007).

According to the ELM individuals exposed to persuasive messages are thought to use either a central route or a peripheral route, which differ in the amount of thoughtful information processing or “elaboration” demanded of individual subjects, to form attitudes (Bhattacherjee and Sanford, 2006; Martin et al., 2011). The individual’s motivation or prior knowledge of information processing determines the degree of elaboration likelihood. When people’s motivation or prior knowledge of how to engage in message-relevant thinking is high, they elaborate issue-relevant arguments or cues (e.g. price, functional specifications) through a central route. A central processing route requires more cognitive effort than a peripheral processing route since the message recipient scrutinises all available information relevant to the message. Any attitude change is driven by the careful consideration of relevant arguments supporting the advocated position (Angst and Agarwal, 2009; Tam and Ho, 2005; Yang et al., 2006). Moreover, attitudes changed by a central route have been found to be more persistent, predictive of behaviour, and resistant to change since they are based on a rational thinking process (Tam and Ho, 2005; Martin et al., 2011). Due to a lack of motivation or ability, only part of the information is processed, and inferences based on simple heuristic cues, such as source credibility or source attractiveness, are used to make the decision without diligent consideration (Bhattacherjee and Sanford, 2006; Jones et al., 2003; Kim and Benbasat, 2003). Research has shown that attitude changes resulting from peripheral cues are less enduring and less resistant than those resulting from the central route to persuasion (Li and Zhan, 2011; Um, 2008). Thus individuals use a peripheral route when their involvement is low, when they are unmotivated to think about the message, or when they are unable to process message-relevant arguments.

Following the perspective of the ELM, we will examine two major classes of persuasion determinants that are directly related to attitude and belief change:
argument quality and source credibility. Figure 1 identifies the key constructs and main relationships examined in the study. As shown, we assert several hypotheses:

- argument quality and source credibility affect members’ relationship quality;
- relationship quality affects community members’ behavioural loyalty; and
- both personal relevance and user expertise moderate the associations between both argument quality and relationship quality, and source credibility and relationship quality.

This section elaborates on these relationships and explains the theoretical underpinning of these hypotheses.

*Argument quality and source credibility*

Argument quality refers to the persuasive strength of arguments embedded in an informational message (Cheung *et al.*, 2008). Presence of evidence, ease of comprehension, opposing viewpoints, and comprehensiveness are possible dimensions of the construct of argument quality (Chiu *et al.*, 2011; Shen *et al.*, 2011; Li and Zhan, 2011). Previous research has contended that argument quality is the central influence and source credibility is the peripheral influence (Sussman and Siegal, 2003; Cheung *et al.*, 2008) and that comprehensiveness and relevance are the most effective components of argument quality, making members key influencers of information adoption.

Source credibility is defined as the extent to which a information source is perceived by information recipients to be believable, competent, and trustworthy (Bhattacherjee and Sanford, 2006). Previous research has indicated that source credibility is an important contributor to an individual’s attitude toward an ad as well as to advertising effectiveness (Clow *et al.*, 2006; Faraj *et al.*, 2011). In these studies source credibility referred to the credibility of the endorser, spokesperson, or individual shown in an

![Figure 1. Research model](image-url)
advertisement. Credible information sources can generally enhance the persuasive effect of a message so that the argument quality has a direct effect and induces more immediate attitude changes. In an online community, members have unlimited freedom to publish and express their feelings toward products or services without disclosing their real identities (Cheung et al., 2008). It is therefore left to the users to determine the expertise and trustworthiness of the contributors in deciding to either adopt or reject the information presented.

**Relationship quality**

Relationship quality has long been regarded as an important marketing concept because of its critical role in the customer decision-making/post-purchase process (Henning-Thurau and Klee, 1997). It can be described as the degree to which a relationship is appropriate for fulfilling the needs of the customer associated with the relationship (Chang and Wang, 2011; Liu et al., 2011; Chiu et al., 2011).

Although there is no consensus regarding the structural nature of relationship quality, several prior studies have conceptualised it as a higher-order construct consisting of several distinct, yet related, dimensions. Most studies agree that relationship quality mainly includes two critical indicators – satisfaction and trust (Sanchez-Franco and Martin-Velicia, 2011; Lee et al., 2011) – since these two dimensions have long been proposed as essential elements in successful relationship marketing. However, researchers have argued that relationship commitment should be added as another important dimension of relationship quality (Royo-Vela and Casamassima, 2011; Chang and Wang, 2011; Casaló et al., 2007). Consequently, there is a growing consensus that better quality relationships are accompanied by more satisfaction, trust, and commitment.

An individual’s satisfaction with a relationship is treated as an affective state resulting from an overall appraisal of his or her relationship with a provider. In marketing-related literature, it has been found to be a primary indicator and source of confirmation of needs and, therefore, a critical driver of positive experience-behaviour (Royo-Vela and Casamassima, 2011; Chang and Wang, 2011). Trust has been conceptualised as the relationship collaborators’ self-assurance that they have developed reliability and integrity between them and as a belief that the other collaborator will only perform actions that result in positive outcomes (Zhou, 2011). Trust forms the basis of any enduring relationship between customers and providers and enables their relationship to move beyond the consideration of day-to-day transactions, thereby helping service firms reduce their marketing costs (Awad and Ragowsky, 2008). Lastly commitment is defined as an attitude that reflects the desire to maintain a valued relationship (Lin et al., 2008). Commitment is one of the cornerstones for the establishment of successful relationships and has been accepted as the focal construct preceding customers’ positive relational behaviours.

In summary, when individuals perceive excellent levels of satisfaction, trust, and relationship commitment, they are likely to have a higher overall perception of the quality of their relationship with a service provider because they feel that the service provider can reduce their perceived uncertainty (i.e. potential for service failure or negative outcomes) and thus meet their expectations, goals, or desires. As a result there
is much empirical support for the importance of relationship quality and its impact on company profitability and customer retention.

Impacts of the dual processing modes on the formation of quality relationships in online communities

From the perspective of the ELM, when members of online communities assess the validity of the content in a message related to a particular issue or problem, they are sufficiently motivated to engage the central route, scrutinising issue-relevant arguments and judging the merits of the received information. Argument quality is consistent with Wang and Strong’s (1996) perspective on data quality, in which quality dimensions include believability, accessibility, relevance, and level of value added (Porter and Donthu, 2008). In interest-based discussion communities, members compose and reply to messages to provide other members with helpful information. When members read a message and respond favourably to quality content provided by an online community forum, these perceptions lead them to have a positive attitude toward the forum (Chidambaram and Tung, 2005).

As a result we argue that perceiving greater argument quality can induce members to be highly satisfied with, trusting of, and committed to an online community since their shared values and interests have been reinforced, thereby strengthening their relationship quality with the community. Based on these arguments we propose the following hypothesis:

H1. The argument quality of informational messages has a positive effect on members’ perceived relationship quality with online communities.

In addition to the central route, individuals who lack motivation or ability are more likely to process related information via peripheral routes such as source credibility, which are mental shortcuts, by focusing on non-content cues (Park et al., 2007). In the context of online communities, perceptions of source credibility also play an important role in people’s judgements of cognitive authority (Sussman and Siegal, 2003). Well-designed online community technologies can present a rich set of features that serve as heuristic cues, such as source credibility.

Previous research has argued that source credibility has a definite impact on attitude towards the advertisements of and purchase intentions towards a service and that the type of visual element used is important in the ad evaluation process (Clow et al., 2006) and related to quality relationships (Eisend, 2006; Hung and Tse, 2011; Jones et al., 2003). For example an author’s name, the number of messages an author has posted, the number of replies that other members have made to an author’s messages, and the seniority ranking of authors are usually displayed together with a message, making it possible to use source credibility as a heuristic cue, particularly when multiple messages by the same source have been read (Zhang and Watts, 2008). For this reason we argue that source credibility is likely to influence members’ perceived relationship quality with an online community because such cues appeal to human emotions rather than their rational judgement (Bhattacherjee and Sanford, 2006). Hence, we hypothesise the following:

H2. The source credibility of informational messages has a positive effect on members’ perceived relationship quality with online communities.
Member’s behavioural loyalty

Customer loyalty is a consumer’s overall attachment or deep commitment to a product, service, brand, or organisation. Customer loyalty manifests itself in a variety of behaviours, the most common of which are repeatedly patronising a service provider and recommending the provider to other customers (Sanchez-Franco and Martin-Velicia, 2011). Since a number of studies have treated these two behaviours as loyalty indicators, in this study, members’ behavioural loyalty is operationally defined as a composite measure based on the members’ visiting frequency, average staying time, and recommendation frequency.

There is abundant empirical support for the association between relationship quality and loyalty. For example, De Wulf et al. (2001) found that relationship quality is a key determinant of repeat purchase behaviour. Lin et al. (2008) found that gamers who fostered higher perceptions of relationship quality toward the games responded with a more positive emotional mood, which led to increased loyalty. Following the same line of logic, in the context of online communities, we argue that satisfied and trusting members will identify with and commit to positive and repeated behavioural loyalty to the community in terms of their visiting frequency, average staying time, and recommendation frequency. Based on the above arguments the following hypothesis is proposed:

H3. A higher perception of relationship quality leads to a higher level of behavioural loyalty from members to online communities.

Moderating roles of personal relevance and user expertise

Previous studies have indicated that people’s motivation and ability play key roles in their evaluation of persuasive messages because they alter people’s levels of elaboration likelihood (Bhattacherjee and Sanford, 2006; Tam and Ho, 2005; Zhang and Watts, 2008). As a result we argue that the effects of argument quality and source credibility are moderated by community members’ motivation and ability to elaborate on the formation of relationship quality with online communities.

Drawing on prior ELM-related studies, this study operationalises the motivation dimension of elaboration as personal relevance, defined as the online community member’s perception of the relevance of the message content posted within communities (Sussman and Siegal, 2003), and the ability dimension of elaboration as user expertise, defined as the community member’s ability to comprehend the message topic in general (Bhattacherjee and Sanford, 2006).

Higher levels of personal relevance will significantly enhance the influence of argument quality on the formation of members’ relationship quality with online communities since highly involved people are more motivated to scrutinise all available information, which requires more effort, thereby forming more informed and stable perceptions of satisfaction, trust, and commitment toward the community. In contrast lower levels of personal relevance cause members to be less motivated to engage in extensive elaboration and to be more influenced by the attractiveness of the characteristics of message-content issuers. In other words peripheral cues, such as the source credibility of the message content, shape the member’s perception of the online community. Therefore, we argue that the effect of argument quality on relationship
quality is moderated by the member’s motivation to elaborate, as reflected in their level of personal relevance. Thus, we hypothesise the following:

**H4.** Personal relevance has a positive moderating effect on the association between argument quality and members' perceived relationship quality with online communities.

**H5.** Personal relevance has a negative moderating effect on the association between source credibility and members' perceived relationship quality with online communities.

Following the same logic, the prior expertise of the message recipient also alters the elaboration likelihood by affecting the individual’s ability to process the message (Sussman and Siegal, 2003). In online communities experts attend more strongly to the quality of arguments and, thus, rely less strongly on peripheral cues, such as source credibility. Conversely, members who are novice users are more likely to rely on peripheral cues, which are mental shortcuts that focus on non-content cues, to process message content. Hence, we propose the following:

**H6.** User expertise has a positive moderating effect on the association between argument quality and members’ perceived relationship quality with online communities.

**H7.** User expertise has a negative moderating effect on the association between source credibility and members’ perceived relationship quality with online communities.

**Methodology and research design**

**Sample and data collection**

To test our hypotheses we identified and selected four interest-based online communities in Taiwan, including Fashion Guide, Map Diary, DCView, and several software development discussion communities, such as Microsoft MSDN (Chu and Chan, 2009). Data were collected using an online survey questionnaire sent to members of several well-known interest-based online communities. Mobile01 and DCView, for example, are two famous electronic products consumption-related discussion communities in Taiwan, and their audience consists of product lovers, novice users, experts, technicians, and other people from related industries and beyond. These communities offer members a place to post, share, and reply to messages about common interests, thereby developing their social network and relationships. Fashion Guide is the biggest and most well-known fashion and cosmetics discussion community in Taiwan and China. Since its inception in 1997, Fashion Guide has grown its member base to 1.98 million registered users, primarily through word of mouth and viral networking. Map Diary is a social networking community through which diary memories can be shared between mainland China and Taiwan; members can share their memories and invite other members to be their private neighbours in the community.

We developed an online version of our survey and posted its URL on the above online communities for about two months. To increase the response rate, all participating users were offered a monetary incentive and a chance to win a prize in a
lottery. The online survey yielded 331 completed questionnaires. Since 11 questionnaires were invalid, we obtained 320 valid responses.

About 52 per cent of the respondents were male and 48 per cent were female. The majority (70.94 per cent) of the subjects were between the ages of 18 and 30 years and had at least a bachelor’s degree. They were also frequent users and experienced members of the communities. Around 87.5 per cent of the participants visited online communities 10 or fewer times every week, and 61.56 per cent reported that the average time they spent on online communities was 5-30 minutes per visit. Another 28.44 per cent of the participants said their visits lasted 30-60 minutes. Moreover 86.94 per cent of the respondents said they had recommended the online community to their friends two or fewer times, showing the significant effect of word of mouth on online communities.

We compared the responding and non-responding communities’ members in terms of gender, age, education, and the frequency with which participants visited online communities. No significant differences among these four groups were found based on independent sample t-tests (p > 0.05).

Measurement development/operationalisation of constructs
All constructs were measured by multiple-item perceptual scales that used pre-validated instruments from prior studies whenever possible and were reworded to relate specifically to the context of online communities. The items used to measure argument quality and source credibility were from Bhattacherjee and Sanford (2006), and those used to measure personal relevance and user expertise were adapted from Sussman and Siegal’s (2003) research. Relationship quality was measured using nine items adapted from De Wulf et al. (2001), and members’ behavioural loyalty with items adapted from Algesheimer et al. (2005). The preliminary instrument was pilot tested and reviewed by faculty and doctoral students for clarity; the questionnaire items were modified following a pretest of the survey instrument with a certain number of real-case respondent samples.

Data analysis and results
Convergent and discriminant validity
We followed the two-step procedure suggested by Anderson and Gerbing (1988) to analyse the collected data. Specifically, before incorporating the structural restrictions, we estimated and re-specified the measurement model. The LISREL 8.50 program was used to perform confirmatory factor analysis (CFA) to test the convergent and discriminant validity of the remaining items and scales. The CFA result indicated that the measurement model fit the data well [χ²(142) = 400.14, NFI = 0.92, NNFI = 0.93, CFI = 0.94, GFI = 0.88, AGFI = 0.84, RMSEA = 0.075]. The criterion used to test convergent validity was whether an indicator’s estimated pattern coefficient was significant with respect to the underlying construct factor. Measurement scales using the following three criteria suggested by Fornell and Larcker (1981) were evaluated. First, all the indicator factor loadings (λ) should be significant and exceed 0.5. Factor loading refers to the correlation between each test question and a particular factor. The correlations could range from 0.00 to 0.99; those below 0.50 are likely to be too low to assume that a meaningful relationship exists between the question and a factor.
Second, the construct reliabilities should exceed 0.8. Finally, the average variance extracted (AVE) for each construct should exceed the variance due to the measurement error for that construct (e.g. AVE should exceed 0.5).

As shown in the Appendix, all the \( \lambda \) values in the CFA model exceeded 0.5, except in the case of one indicator of relationship quality (standardised loading = 0.48), but were all significant at \( p = 0.001 \). Moreover, the composite reliabilities of the constructs ranged from 0.81 to 0.97 (Table I). The AVE, which ranged from 0.58 to 0.94, was greater than the variance due to measurement error. Therefore, all three conditions for convergent validity were met.

Meanwhile, discriminant validity is the degree to which the measures of two constructs are empirically distinct (Bagozzi et al., 1991). Discriminant validity is shown when the square root of each construct’s AVE is larger than its correlations with other constructs (Chin, 1998). From the data presented in Table I, we can see that the highest correlation between any pair of constructs in the CFA model is 0.76, between relationship quality (RQ) and source credibility (SRC). This figure is lower than the lowest square root of AVE among all of the constructs, which is 0.97 for personal relevance (PER). Hence, the discriminant validity criterion was also met for our data sample.

**Hypothesis testing: main effects**

We tested our research model using the structural equation modelling approach. Overall the goodness of fit of the structural model was comparable to that of the CFA model, which constituted evidence of adequate fit. With regard to the specific hypotheses, we found the following:

\( H1 \) and \( H2 \): Our results supported the hypotheses that both argument quality (\( \beta = 0.26, p < 0.001 \)) and source credibility (\( \beta = 0.61, p < 0.001 \)) have significant and positive effects on users’ perceived relationship with online communities. These two factors jointly explained 64 per cent of the variance in relationship quality, with source credibility contributing a larger proportion.

\( H3 \): As expected relationship quality had a strong and significant effect (\( \beta = 0.44, p < 0.001 \)) on members’ behavioural loyalty, accounting for 19 per cent of the variance in members’ behavioural loyalty (see Figure 2).

**Hypothesis testing: moderating effects**

Following Sussman and Siegal’s (2003) suggestions, the hypothesised moderating effects were analysed separately since these effects are in opposing directions and would therefore obscure one another. As shown in Table II, we found that personal relevance strongly moderates the effect of argument quality on relationship quality and that the positive path coefficient (\( \beta = 0.183, p < 0.01 \)) is in the same direction as predicted by our theory, supporting the argument of \( H4 \). The path coefficient of the interaction term of personal relevance and source credibility is negative and significant (\( \beta = -0.08, p < 0.05 \)); thus \( H5 \) is also supported. Furthermore, user expertise strongly moderates the effects of argument quality (\( \beta = 0.196, p < 0.05 \)) and source credibility (\( \beta = -0.107, p < 0.05 \)) on relationship quality, and both the positive and negative path coefficients are in the same direction as predicted by our theory, thereby supporting the arguments of \( H7 \) and \( H8 \). We discuss these findings in detail in the next section.
<table>
<thead>
<tr>
<th>Construct</th>
<th>Mean</th>
<th>SD</th>
<th>Cronbach’s alpha</th>
<th>Composite reliability</th>
<th>AVE</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ARG</td>
<td>5.05</td>
<td>1.19</td>
<td>0.92</td>
<td>0.92</td>
<td>0.74</td>
<td>0.86</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. SRC</td>
<td>4.60</td>
<td>1.15</td>
<td>0.90</td>
<td>0.89</td>
<td>0.67</td>
<td>0.68</td>
<td>0.82</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. RQ</td>
<td>4.48</td>
<td>1.16</td>
<td>0.91</td>
<td>0.91</td>
<td>0.58</td>
<td>0.64</td>
<td>0.76</td>
<td>0.76</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. LOYAL</td>
<td>2.20</td>
<td>1.03</td>
<td>0.71</td>
<td>0.81</td>
<td>0.58</td>
<td>0.36</td>
<td>0.40</td>
<td>0.38</td>
<td>0.76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. PER</td>
<td>3.86</td>
<td>1.62</td>
<td>0.93</td>
<td>0.97</td>
<td>0.94</td>
<td>0.27</td>
<td>0.18</td>
<td>0.26</td>
<td>0.24</td>
<td>0.97</td>
<td></td>
</tr>
<tr>
<td>6. EXPERT</td>
<td>4.70</td>
<td>1.22</td>
<td>0.90</td>
<td>0.94</td>
<td>0.84</td>
<td>0.25</td>
<td>0.32</td>
<td>0.27</td>
<td>0.27</td>
<td>0.11</td>
<td>0.92</td>
</tr>
</tbody>
</table>

**Notes:** The main diagonal shows the square root of the AVE (averaged variance extracted). Significance at $p < 0.01$ level is shown in italics. ARG= Argument quality, SRC= Source credibility, RQ= Relationship quality, LOYAL= Behavioural loyalty, PER= Personal relevance, EXPERT= User expertise.
Discussion
This study aims to fill the research gap in our understanding of the processes that influence the development of members’ relationship quality and the consequent impact on behavioural loyalty to online communities by using the ELM perspective. Our findings have significant implications for the administration of online communities as they need to be focused and leveraged to create sustained online community performance gains.

First, we found that both argument quality and source credibility directly affect members’ relationship quality. The influences of the central and peripheral routes are not mutually exclusive in the context of our study: they are both important ways of influencing the formation of members’ relationship quality. We also found that source credibility was more influential on the generation of members’ relationship quality. This result implies that to facilitate members’ closer relationship quality with online communities, using diverse credible resources for discussion content will have a stronger effect than providing better argument quality for discussion content. When facing huge amounts of qualified informational content, credible resources, such as an author’s name or seniority ranking, serve as very useful heuristic cues to help users efficiently evaluate products and make decisions (Bhattachjee and Sanford, 2006). As a result the related hypotheses are supported.

![Diagram](image)

**Notes:** Standardised coefficients are reported; * * p < 0.05; ** * p < 0.01; *** * p < 0.001

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Main effect</th>
<th>Moderator</th>
<th>Interaction term</th>
</tr>
</thead>
<tbody>
<tr>
<td>H4: Argument quality × personal relevance</td>
<td>Beta = 0.525</td>
<td>Beta = 0.131</td>
<td>Beta = 0.183</td>
</tr>
<tr>
<td></td>
<td>* t = 14.596</td>
<td>* t = 2.963</td>
<td>* t = 3.053</td>
</tr>
<tr>
<td></td>
<td>Sig. T = 0.001 ***</td>
<td>Sig. T = 0.01 **</td>
<td>Sig. T = 0.05 **</td>
</tr>
<tr>
<td>H5: Source credibility × personal relevance</td>
<td>Beta = 0.697</td>
<td>Beta = 0.109</td>
<td>Beta = 0.080</td>
</tr>
<tr>
<td></td>
<td>* t = 21.691</td>
<td>* t = 2.625</td>
<td>* t = 2.24</td>
</tr>
<tr>
<td></td>
<td>Sig. T = 0.001 ***</td>
<td>Sig. T = 0.01 **</td>
<td>Sig. T = 0.05 *</td>
</tr>
<tr>
<td>H6: Argument quality × user expertise</td>
<td>Beta = 0.485</td>
<td>Beta = 0.158</td>
<td>Beta = 0.196</td>
</tr>
<tr>
<td></td>
<td>* t = 12.256</td>
<td>* t = 3.126</td>
<td>* t = 2.79</td>
</tr>
<tr>
<td></td>
<td>Sig. T = 0.001 ***</td>
<td>Sig. T = 0.01 **</td>
<td>Sig. T = 0.01 **</td>
</tr>
<tr>
<td>H7: Source credibility × user expertise</td>
<td>Beta = 0.702</td>
<td>Beta = 0.045</td>
<td>Beta = 0.107</td>
</tr>
<tr>
<td></td>
<td>* t = 21.538</td>
<td>* t = 1.227</td>
<td>* t = 2.174</td>
</tr>
<tr>
<td></td>
<td>Sig. T = 0.001 ***</td>
<td>Sig. T = 0.19</td>
<td>Sig. T = 0.05 *</td>
</tr>
</tbody>
</table>

Table II. Results of regression testing for moderation effects, H4 to H7
Second, we found that relationship quality was positively related to members' behavioural loyalty to online communities, which is consistent with prior findings in several online environments (e.g. Henning-Thurau and Klee, 1997; Chiu et al., 2011; Roberts et al., 2003). Relationship quality is conceptualised as a construct consisting of three important components: satisfaction, trust, and commitment. When a satisfied member trusts and makes a commitment to an online community, it also means the member wants to have a long-lasting relationship with the community, thereby gradually increasing staying time, frequency of visits, and recommendation frequency, which reflect behavioural loyalty to the community. Therefore, and as expected, a higher relationship quality will induce stronger behavioural loyalty from members to online communities.

In conducting this study, we also found that all moderating hypotheses were supported and that the positive and negative path coefficients are in the same direction as predicted by our theory. First, personal relevance was operationalised as the degree of an online community member’s elaboration motivation, and user expertise was represented as the degree of ability. As expected, both personal relevance and user expertise positively moderate the relationship between argument quality and relationship quality; they also negatively moderate the relationship between source credibility and relationship quality. Consistent with several prior findings (e.g. Bhattacherjee and Sanford, 2006; Sussman and Siegal, 2003), as personal relevance and user expertise increase, people are more motivated to process issue-relevant arguments. People with more issue-relevant motivation and prior knowledge tend to enjoy cognitive tasks that require more effort and evaluate messages by scrutinising and elaborating on issue-relevant arguments (Huang et al., 2006). As a result higher personal relevance and user expertise positively and significantly moderate the relationship between argument quality and relationship quality and negatively moderate the relationship between source credibility and relationship quality. Therefore, the moderation hypotheses are supported.

Implications and conclusions

Implications
For researchers, although prior ELM-based studies have applied the theory within other contexts, such as IT acceptance, decision making, or knowledge acceptance (e.g. Bhattacherjee and Sanford, 2006; Sussman and Siegal, 2003), this study not only reinforces the findings from these studies but especially illuminates two types of influential processes, the central and peripheral routes, that can effectively achieve the desired attitude change in the context of online communities. Moreover as Wang et al. (2009) stated, when consumers access the internet for specific goals (e.g. looking for product specifications, trial information, or users’ opinions), the focus is placed on certain objects or types of information. Goal-directed members engage more cognitive effort and higher degrees of elaboration likelihood to scrutinise all available information relevant to the content they want, thereby taking the central route for their evaluation.

In contrast the message contents are not the main focus for low-involvement or non-goal-directed members; however the salience of non-focal information, such as presentation schemes or source credibility, will significantly draw their attention.
(Janiszewski, 1998). As a result argument quality and credible sources are two viable ways to influence and thus form members’ attitudes toward online communities in terms of satisfaction, trust, and commitment. By focusing on these two influential information processes, we were able to apply a well-developed body of ELM perspectives to the problem of understanding the antecedents of members’ relationship quality formation and subsequent behavioural loyalty in the online community context.

For practitioners the present study can help managers of online communities recognise the differential effects of these information processes across a user population and customise optimal strategies that best fit the unique characteristics of their community members. The argument quality of members’ co-created information content is definitely a precondition of running interest-based communities because it plays the central role for higher elaboration likelihood members to first scrutinise all relevant information and make their judgements afterward. To make the content of arguments more convincing, Toulmin’s model of argumentation could serve as an appropriate mechanism (Kim and Benbasat, 2009). According to Toulmin’s (1958) model of argumentation, three elements of arguments – claim, data, and backing – commonly strengthen the persuasive degree of arguments. Claim is the conclusion of an argument, data refer to the evidence used to support a claim, and backing is the proof that one should accept the data. According to the findings of Kim and Benbasat’s (2009) study, arguments that included all three elements could effectively increase consumers’ trust beliefs. As such, when better and appropriate argument quality intervention strategies are implemented, it is possible to increase members’ relationship quality.

Our study also showed that, in addition to higher-quality information content, source credibility is another important and more influential way to foster members’ relationship quality. Consequently, it is crucial to provide various indicators of source credibility for information content. For example, when posting messages, the profiles, credibility rankings, or seniority of members could be shown next to the messages. The “like” button developed by Facebook is also a good approach toward generating better message source credibility. The participation of well-known field experts in interest-related issue discussions may be another feasible way to enhance the credibility of community content. Finally, periodic events for members to select the most updated and useful information content are also very effective ways to strengthen the development of source credibility.

Limitations of the study and suggestions for future research
We acknowledge that a number of research limitations exist in our research, which should be overcome in the future. First, we conducted the research using the member base of various popular interest-based online communities in Taiwan. Although this was the strength of the study, these samples may not allow researchers to draw more general conclusions across different types of community contexts, thus limiting the extent to which the findings can be generalised. Examining our research model across different types of online communities — not only interest-based ones but also other types, such as transaction-, relationship-, or fantasy-based ones — would help establish the generalisability of these results beyond the current context.
Second we operationalised and investigated one peripheral cue in this study, namely, source credibility. As Bhattacharjee and Sanford (2006) stated, source credibility might be viewed differently by users depending on the extent of their elaboration, resulting in idiosyncratic effects on the dual process model. As a result we recommend that future researchers investigate the effects of various types of credible sources (e.g. author’s name, number of member replies to information content, author’s seniority) on the formation of members’ relationship quality with online communities.

In sum these questions open up fertile ground for future research opportunities. Exploring these potential dynamics would be a helpful contribution to our understanding of service management and the retention of members in the long-term, for online communities.

References


## Appendix. Measurements

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Standardised loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Argument quality</strong> <em>(Bhattacherjee and Sanford, 2006)</em></td>
<td></td>
</tr>
<tr>
<td>The information provided on the community was informative</td>
<td>0.92</td>
</tr>
<tr>
<td>The information provided on the community was helpful</td>
<td>0.93</td>
</tr>
<tr>
<td>The information provided on the community was valuable</td>
<td>0.81</td>
</tr>
<tr>
<td>The information provided on the community was persuasive</td>
<td>0.76</td>
</tr>
<tr>
<td><strong>Source credibility</strong> <em>(Bhattacherjee and Sanford, 2006)</em></td>
<td></td>
</tr>
<tr>
<td>The authors of posted issues were knowledgeable on related topics</td>
<td>0.80</td>
</tr>
<tr>
<td>The authors of posted issues were trustworthy</td>
<td>0.85</td>
</tr>
<tr>
<td>The authors of posted issues were credible</td>
<td>0.82</td>
</tr>
<tr>
<td>The authors of posted issues appeared to be experts on related topics</td>
<td>0.81</td>
</tr>
<tr>
<td><strong>Personal relevance</strong> <em>(Sussman and Siegal, 2003)</em></td>
<td></td>
</tr>
<tr>
<td>How involved are you in the related discussion issues?</td>
<td>0.96</td>
</tr>
<tr>
<td>How much have the issues discussed been on your mind lately?</td>
<td>0.97</td>
</tr>
<tr>
<td><em>(1: not at all to 7: a great deal)</em></td>
<td></td>
</tr>
<tr>
<td><strong>User expertise</strong> <em>(Sussman and Siegal, 2003)</em></td>
<td></td>
</tr>
<tr>
<td>How informed are you on the subject matter of the issue?</td>
<td>0.94</td>
</tr>
<tr>
<td><em>(1: novice to 7: expert)</em></td>
<td>0.93</td>
</tr>
<tr>
<td>To what extent are you an expert on the topic of the issue?</td>
<td></td>
</tr>
<tr>
<td><em>(1: not at all to 7: a great deal)</em></td>
<td></td>
</tr>
<tr>
<td><strong>Relationship quality</strong> <em>(De Wulf et al, 2001)</em></td>
<td></td>
</tr>
<tr>
<td>Satisfaction</td>
<td></td>
</tr>
<tr>
<td>As a regular member, I have a high-quality relationship with this community</td>
<td>0.63</td>
</tr>
<tr>
<td>I am happy with the efforts this community is making toward regular members like me</td>
<td>0.65</td>
</tr>
<tr>
<td>I am satisfied with the relationship I have with this community</td>
<td>0.71</td>
</tr>
<tr>
<td><strong>Trust</strong></td>
<td></td>
</tr>
<tr>
<td>This community gives me a feeling of trust</td>
<td>0.92</td>
</tr>
<tr>
<td>I have trust in this community</td>
<td>0.89</td>
</tr>
<tr>
<td>This community gives me a trustworthy impression</td>
<td>0.86</td>
</tr>
<tr>
<td><strong>Relationship commitment</strong></td>
<td></td>
</tr>
<tr>
<td>I am willing “to go the extra mile” to remain a member of this community</td>
<td></td>
</tr>
<tr>
<td>I feel loyalty toward this community</td>
<td></td>
</tr>
<tr>
<td>Even if this community were more difficult to reach, I would still keep visiting it</td>
<td></td>
</tr>
<tr>
<td>Dropped</td>
<td></td>
</tr>
<tr>
<td>Behavioural loyalty <em>(Algesheimer et al, 2005)</em></td>
<td></td>
</tr>
<tr>
<td><strong>Visiting frequency</strong> <em>(Weekly)</em></td>
<td>(1) 0-2 times, (2) 3-5 times, (3) 6-10 times, (4) 11-20 times, (5) &gt; = 21 times</td>
</tr>
<tr>
<td><strong>Average staying time</strong></td>
<td>(1) &lt; 5 minutes, (2) 5-15 minutes, (3) 15-30 minutes, (4) 30-60 minutes, (5) &gt; = 60 minutes</td>
</tr>
<tr>
<td><strong>Recommendation frequency</strong> <em>(Weekly)</em></td>
<td>(1) 0 times, (2) 1-2 times, (3) 3-5 times, (4) 6-10 times, (5) &gt; = 11 times</td>
</tr>
</tbody>
</table>

Table AI.
About the authors
Chun-Der Chen is an Assistant Professor in the Department of Business Administration at Ming Chuan University, Taiwan. He gained his PhD in Information Management from National Central University in 2007. His teaching and research interests focus on online marketing, customer relationship management, supply chain management and organisational behaviour. His major publications have been in the areas of e-business and management of IS, and his papers have appeared in Online Information Review, Journal of Information Management, Management Review, and other journals. He has served on several academic journals and conferences as a chair or reviewer and is also a consultant to government agencies and enterprises.

Edward C.S. Ku is an Associate Professor in the Department of Travel Management at National Kaohsiung University of Hospitality and Tourism. He gained his PhD from the Graduate School of Business Administration, National Central University. His research interests include e-commerce, supply chain management, knowledge management and information systems applied in travel management. His papers have been published in Internet Research, The Service Industries Journal, International Journal of Hospitality Management, and others. Dr Ku is the corresponding author and can be contacted at: edwardku@mail.nkuht.edu.tw

To purchase reprints of this article please e-mail: reprints@emeraldinsight.com
Or visit our website for further details: www.emeraldinsight.com/reprints