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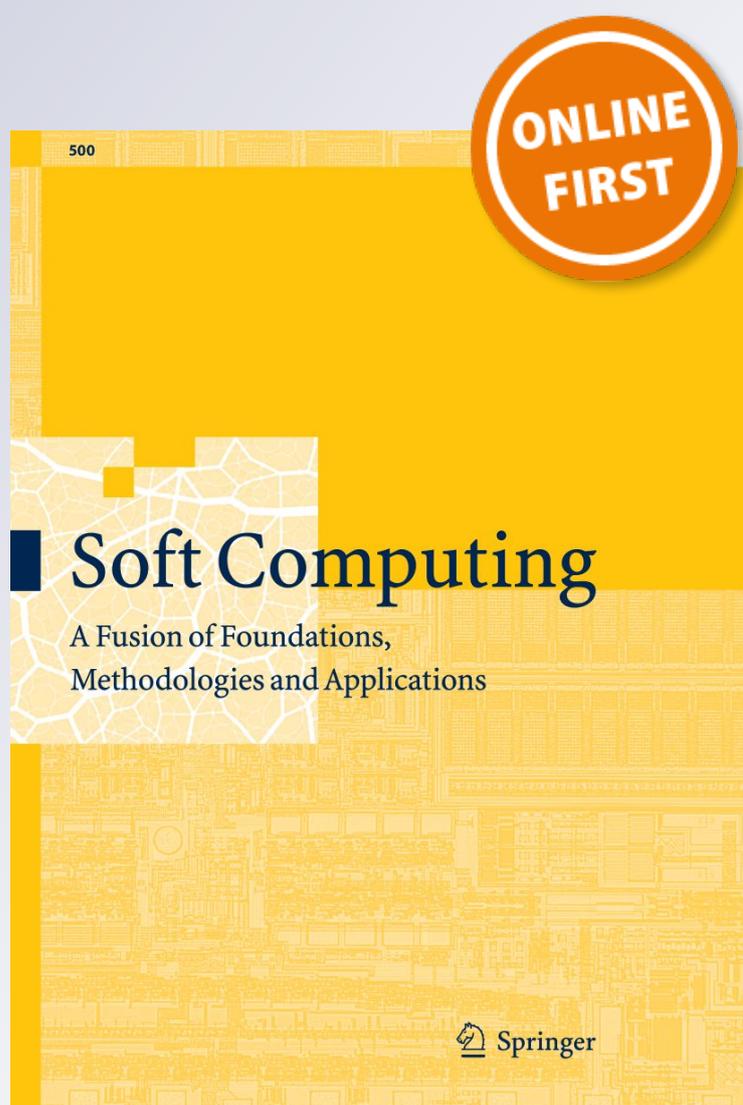
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An empirical study on effects of electronic word-of-mouth and Internet risk avoidance on purchase intention: from the perspective of big data

Yu-Hsi Yuan¹ · Sheng-Hao Tsao² · Jiin-Tian Chyou² · Sang-Bing Tsai³

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Abstract

This study investigated the influence of the usefulness of E-word-of-mouth (eWOM) and Internet risk avoidance on consumers' purchase intention. In particular, because consumers typically exhibit gender difference in their purchase intentions, this study adopted a quasi-experimental design and developed four situational questionnaires on gender difference. The objective of this study was to understand the influence of related factors on consumers' hotel reservation intention. A total of 512 effective data were collected via online questionnaires. The results showed that eWOM and Internet risk avoidance were significantly and positively correlated with consumers' purchase intention, and eWOM had higher predictive power than Internet risk avoidance did. The results reveal that both male and female respondents emphasized hotel facilities, and their purchase intention was positively influenced by related positive comments. However, female respondents paid more attention to hotel service quality than male respondents did.

Keywords E-word-of-mouth · Internet risk avoidance · Purchase intention · Enterprise information systems · Big data

1 Introduction

Amidst the ongoing advancement of information and communications technology (ICT), the Internet has become an integral source of information at work and at home, and electronic word-of-mouth (eWOM) has become a vital

factor influencing Internet users' subsequent decisions and actions (Fan and Miao 2012). Many previous studies have indicated that social factors in virtual communities such as social norms and social opinions affect people's acceptance of eWOM (Fan and Miao 2012; Hennig-Thurau and Walsh 2004; Huang and Chen 2006; Kozinets et al. 2010; Okazaki 2009). The eWOM was a kind of interactive behaviour generated by users from social media such as Twitter, Facebook, Instagram, Blogs, or Weibo. In addition, the qualitative analysis technique was applied word-cloud to segregate into sentence for frequency count (Alboqami et al. 2015).

With the increase of leisure awareness in Taiwan, people are attaching greater value to leisure and entertainment. More working-class individuals are taking vacations and more students are planning trips with their friends and families during summer and winter vacation. Moreover, the government's efforts in promoting travel fuel people's travel intentions. According to a report published by Taiwan's Tourism Bureau (Table 1), not only did the average number of leisure trips per person increase by 1.23 times between 2009 and 2010, but the number of domestic leisure trips per person also exhibited an upward trend. Moreover, the average length per trip was more than 1 day, which

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Table 1 The indices of domestic tour summary from 2008 to 2017

Index	Domestic tour rate by person (%)	Average tour by person (time)	Total tour of domestic by person (thousand times)	Average stay (day)	Holiday tour rate (%)	Total tour satisfaction (%)	Person/daily tour expense in average (US D)	Person/single tour expense in average (USD)
2008	92.50	4.81	96,197	1.51	74.20	97.20	40.17	60.67
2009	93.40	4.85	97,990	1.49	73.20	98.10	38.12	56.81
2010	93.90	6.08	123,937	1.49	71.90	98.00	40.80	60.81
2011	95.40	7.42	152,268	1.50	69.70	98.10	46.10	69.14
2012	92.20	6.87	142,069	1.47	71.20	98.10	43.66	64.16
2013	90.80	6.85	142,615	1.47	70.50	98.20	43.66	64.17
2014	92.90	7.47	156,260	1.45	69.40	97.60	45.01	65.26
2015	93.20	8.50	178,524	1.44	68.70	97.40	44.12	63.52
2016	93.20	9.04	190,376	1.44	68.80	97.30	44.87	64.60
2017	90.10	8.7	183,449	1.49	69.40	97.50	48.25	71.90

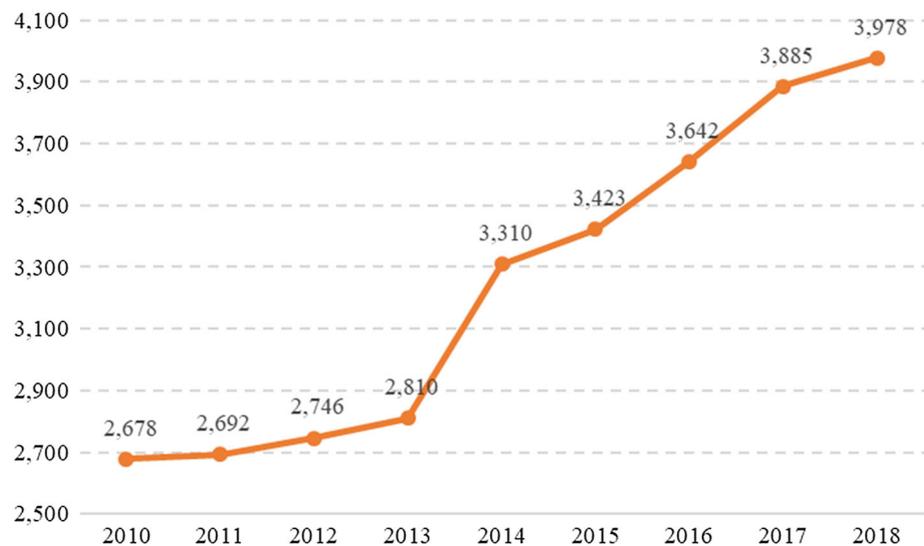
Source: Tourism Bureau, Ministry of Transportation and Communications (Tourism Bureau, Ministry of Transportation and Communications 2019)

suggests that many travellers were arranging overnight accommodation. Accommodation providers include hotels, bed and breakfasts, and hostels, with hotels accounting for the largest proportion in Taiwan.

The number of hotels in Taiwan exhibits a gradually rising trend (Fig. 1). Since 2010–2018, this number has increased exponentially. The development of Internet technologies has led to a prevalence of online booking systems that enable consumers to book accommodation easily and conveniently. However, choosing an appropriate establishment may be difficult when presented with such a large selection of providers. Under such circumstances, word-of-mouth (WOM) is a decisive factor. Previous studies on the effects of WOM on decision-making can be broadly classified into quantitative and qualitative studies.

Quantitative studies examine the effects of WOM on consumers through numbers, such as the effects of consumer ratings and hotel star ratings on consumers. Qualitative studies refer to text-based research on the effects of WOM on consumers, such as the positivity or negativity and emotional phrasing of comments. Hotel operators were becoming increasingly aware of the importance of consumers' online comments and have developed strategies to respond to these comments. People enjoy stories because stories satisfy people's needs (McKee 2003). Therefore, in anticipation of consumers spreading positive and personal WOM, many enterprises have adopted storytelling approaches to marketing. Because when consumers evaluate a service, spreading WOM does not generate benefits for the communicators, WOM was regarded as a crucial

Fig. 1 The develop trend of hotels in Taiwan from 2010 to 2018 Source: Tourism Bureau, Ministry of Transportation and Communications (Tourism Bureau, Ministry of Transportation and Communications 2019)



factor in service evaluation (Bansal and Voyer 2000). Consumers were influenced by others with similar traits (Rogers 1983), and thus, WOM coupled with a story to describe experiences of products and services renders information more persuasive (McKee 2003).

In summary, Taiwanese people are becoming increasingly aware of the value of leisure and entertainment. This rise in awareness influences the development of the hotel industry and consequently provides a more extensive selection for consumers. Consumers cannot always rely on the experiences of family and friends when making decisions regarding accommodation. Because of the prevalence of the Internet, consumers increasingly rely on WOM when making decisions. Hotel administrators are beginning to realize the power of WOM; many seek to apply WOM marketing to generate profits for their companies. Thus, stories of hotel brands were no longer created solely by enterprises; they are co-created by enterprises and consumers. The effects of such stories on purchase intention warrant elucidation. Further, because the development and continuation of online marketing are rising dramatically, the effectiveness of word-of-mouth is deeper accordingly. Meanwhile, the risk avoidance intention affected consumer's purchase behaviour obviously. It was insufficient stimulate framework to detect the consumer's mind-set from gender perspective. Therefore, this study is trying to explore the cause-effect relationship among users' purchase behaviour, perspective of word-of-mouth, and avoidance intention via designed instruments. Moreover, to determine the users' response beyond the word-cloud technique, the data mining approach was employed in this study.

2 Literature review

2.1 Traditional WOM and eWOM

Arndt (1967) defined WOM as oral person-to-person communication concerning a brand, product, or service between a receiver and a communicator whom the receiver perceives as noncommercial. WOM includes the exchange of ephemeral oral or spoken messages between a contiguous source and a recipient who communicates directly in real life. Instead of creating or revising products or services, consumers merely exchange their perceived product performance and service quality. Notably, no records are stored when engaging in this form of communication (Buttle 1998). The development of ICT and the prevalence of the Internet have gradually transformed WOM into eWOM. Moreover, the popularization of social media (e.g. blogs, forums, and commentary websites) has enabled eWOM to become highly influential. Hart and Blackshaw

(2006) highlighted the power of eWOM, explaining that the propagation of traditional WOM was limited by social networks, whereas eWOM can be spread globally online.

The main difference between traditional WOM and eWOM is that eWOM can reach much further, be viewed countless times, and be stored. In addition, eWOM is free of brand, product, and service constraints (Buttle 1998). However, because of the sheer number of communicators, eWOM typically contains positive and negative commentary (Xie et al. 2011). Motivation for providing feedback can be categorized into voluntary and induced factors. Voluntary motivation refers to consumers' autonomous feedback of their experiences of using products and services, whereas induced motivation refers to consumers providing positive feedback to receive incentives (Buttle 1998). In other words, WOM is a product of perceived service quality and value (Hartline and Jones 1996). Although eWOM has many benefits, it also presents a number of problems. Sources of eWOM are less credible and transparent than those of traditional WOM. Harrison-Walker (2001) attempted to conceptualize WOM by using a set of measures, but the results were criticized for being overly superficial (Mazzarol et al. 2007).

Many studies validating the immense effects of WOM on consumer behaviours had been published. Homer and Yoon (1992) asserted that consumers are more careful when viewing negative messages than when viewing positive messages. Other studies have found that negative WOM heavily influenced consumer evaluations of brand value (Mizerski 1982; Richins 1983) and purchase intention (Park and Lee 2009). In such contexts, the effects of positive and negative WOM on purchase intention are a crucial topic of research.

2.2 Hotel core values and service attributes

Hotels provide consumers with tangible and intangible services. The service market is extremely competitive, and thus, maximizing service performance and minimizing service failure are vital for success (Chu and Choi 2000). Therefore, understanding customer evaluations of product and service attributes and performance is a key actuator of WOM passing (Han et al. 2009). Service performance refers to individuals' perceptions of the services they receive (Oliver 1997). To further clarify this concept, Clemmer (1990) proposed the Three Rings of Perceived Value to describe product and service attributes. The first ring is core services, or more specifically, the value and technical aspects of products and services. The second ring is service support, which encapsulates the first ring and governs aspects such as personal services and guarantee. The third ring is value-added services, which if well maintained can convert consumer satisfaction into loyalty.

The Three Rings of Perceived Value were conceptualized as shown in Fig. 2.

Many studies have investigated the effects of service performance on consumers' post-purchase behaviours and satisfaction (Kim et al. 2015; Bitner et al. 1990). Service performance comprises core services and service encounters (Bitner et al. 1990). The core services of hotels are cleanliness, room comfortability, effective check-in and check-out procedures, reliable booking systems, and first-class equipment, environment, and atmosphere (Keaveney 1995). Service encounters have been widely discussed in studies on marketing and consumer behaviour. Shostack (1985) defined service encounters as enterprise–consumer interactions. These interactions are not limited to human interaction but rather encompass interactions involving people, physical attributes, and tangible and intangible factors. Most related studies have narrowed the definition of service encounters to include only consumer–provider interactions (Keaveney 1995; Han et al. 2011) to measure mutual understanding between serving staff and consumers, the provision of additional attention, perceived real interactions, and service provider's competence to meet customer expectations (Keaveney 1995).

Some studies have categorized hotel attributes into “core” and “peripheral” attributes. “Core” attributes refer to material transfer (i.e. providing products and services to consumers), whereas “peripheral” attributes refer to the transfer process (i.e. how products and services are transferred by employees) (McDougall and Levesque 2000). Other studies have categorized hotel attributes into “tangible” and “intangible” attributes. “Tangible” attributes refer to physical facilities such as the availability of a bar, health and fitness facilities, and a swimming pool. “Intangible” attributes refer to aspects such as cleanliness,

comfortability, and safety. In addition, some studies have categorized hotel attributes in terms of “tangible” and “sales” concepts (Danaher and Mattsson 1998). In summary, attribute categorization typically centres on the “core” and “service” concepts, with “core/service” as the mainstream classification.

A hotel's “core” performance is a key factor influencing consumer decisions (Atkinson 1988). Service enterprises generally acknowledge that consumer-based evaluations of “service” concepts are a crucial indicator for consumers (McCull-Kennedy and White 1997). In addition, hotel operators acknowledge that “core” and “service” concepts directly influence consumers' decision-making processes (Chu and Choi 2000). Product characteristics or attributes can be categorized into five quality groups based on importance as perceived by consumers (Kano et al. 1984). The associations between these qualities and consumer satisfaction were described as follows:

- (1) Attractive qualities: Consumers are unable to anticipate the qualities in this group. Therefore, the absence of these qualities does not cause dissatisfaction; by contrast, their presence greatly increases satisfaction when fulfilled.
- (2) One-dimensional qualities: Consumer satisfaction was generally considered one-dimensional. In other words, satisfaction and quality have a linear relationship; satisfaction increases concurrently with perceived quality.
- (3) Must-be qualities: The qualities in this group are crucial. Must-be qualities are those that consumers expect. When implemented well, customers feel neutral. When implemented poorly, customers feel highly dissatisfied. In other words, must-be qualities are those that consumers take for granted.
- (4) Indifferent qualities: Consumers have no preferences for the qualities in this group. Therefore, the presence of these qualities neither increases nor decreases consumer satisfaction.
- (5) Reverse qualities: The qualities in this group increase consumer dissatisfaction relative to one-dimensional qualities.

Among these five quality groups, attractiveness influences consumer satisfaction most significantly. Many previous studies have focused on identifying the attributes that exert the greatest influence on consumer satisfaction (Li and Liu 2014; Manickas and Shea 1997; Zehrer et al. 2011). Moreover, a number of studies have examined the primary attributes that consumers consider when choosing a hotel. The findings of these studies are given in Table 2. According to previous studies, the common approach for measuring the factors consumers consider when choosing a hotel is to extract attributes from previous studies and

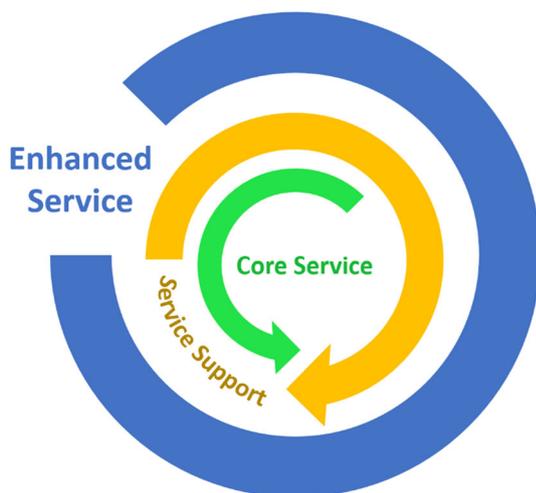


Fig. 2 The Three Rings of Perceived Value *Source:* Adopted from Clemmer (1990)

Table 2 Summary of the consideration factors when consumer chooses hotel

Researchers	Findings
Atkinson (1988)	Sequence: Tidy, safety, value, courtesy of attendant
Rivers et al. (1991)	Location convenience, overall service quality
Ananth et al. (1992)	Sequence: Price and quality, safety, location convenience
Chu and Choi (2000)	Service quality, facilities, value, room and front desk service, food and entertainment, safety
Yavas and Babakus (2005)	Sequence: General facilities, core service, convenience, ambience, room facilities
Lockyer (2005)	Sequence: Tidy, room security system, effective of front desk, no smoking room, good exhaust and water supply system, sound insulation, room maintenance
Hsieh et al. (2008)	For hot springs hotel: Personalized service, price, hygiene of hot springs, traffic convenience, special promotion, convenient reservation process, beverages and food service
Sohrabi et al. (2012)	Comfortable, safety, Internet service, fun, service quality, entertainment, tidy, cost, room facilities
Williams and Buttle (2014)	Personalized service, attractiveness, relax, service quality, prestige, price

Source: The authors

consolidate these attributes in a questionnaire and then administer the questionnaire among consumers to gauge each attribute's importance as perceived by consumers when choosing a hotel. Some scholars have performed factor analyses on returned questionnaires to attribute questionnaire items to specific factors, whereas others have directly ranked items in order of importance. Although attributes have differed depending on the researcher, some similarities are still evident. Based on the findings in Table 2, the attributes used extensively in previous studies are safety, cleanliness, room comfortability, and service provided by hotel staff.

2.3 Risk avoidance

Before choosing hotels, consumers may seek external resources such as the opinions of friends and family members or others' experiences posted online to aid their decision-making. This process reduces the levels of uncertainty and risk perceived by consumers (Hennig-Thurau et al. 2004; McCleary and Weaver 1993). Hennig-Thurau and Walsh (2004) asserted that the motivations behind seeking such resources are risk reduction, search time reduction, determination of social position, dissonance reduction, belonging to a virtual community, learning which products are new on the market, and learning how a product is to be consumed. Furthermore, gender influences search motivation (Kim et al. 2011). Consumers in the USA produce 3.5 billion WOM narratives every day (Keller 2007). Because of the internet users were difficult to obtain truthful information from web. Thus, they were highly concerned the information of product or service that distributed from marketing by firms was untrustworthy. On

the other hand, the internet users would rather to believe other user's opinions or feedbacks (Winer 2009). Therefore, consumers rely on online resources such as blogs, forums, and commentary websites (Xiang and Gretzel 2010) to access effective WOM in their everyday life (Carl 2006), which can aid their decision-making. Gretzel (2007) confirmed that online comments served a key function in consumers' travel planning processes, particularly when choosing accommodation. Traditional marketing tools are gradually losing their effectiveness, whereas WOM was becoming increasingly useful (Keller and Berry 2003). Therefore, some researchers have attached great value to the effects of WOM. Previous studies have found that comments exert significantly positive effects on hotel bookings (Ye et al. 2011), restaurant popularity (Zhang et al. 2010), purchase intention (Xie et al. 2011; Sparks and Browning 2011), attitude (Purnawirawan et al. 2012), trust (Sparks and Browning 2011), WOM effects (Park and Lee 2009), and consumer ratings (Ögüt and Taş 2012), the summarized factors of consumer choose hotel given in Table 2. Furthermore, some previous studies have noted that under identical economic conditions, women are more likely to practice risk avoidance than men when managing investments (Powell and Ansic 1997; Chiu et al. 2002; Lockyer 2005). Based on the preceding discussion, the following hypothesis was formulated:

H1 Risk avoidance influenced the purchase intention positively.

2.4 Usefulness of eWOM

Relevant information and others' product experiences can be easily accessed online without time or space limitations.

In addition, people can easily share their experiences with others. Experience of using some products constitutes a subjective opinion that varies depending on individual preferences. Therefore, a product generally receives positive and negative customer reviews. Moreover, managers are beginning to realize the potential of WOM and its strong effects on consumer decisions. Some reviews may be untrue or misleading and some may be fabricated by businesses to undermine their competitors. Thus, trust is a crucial aspect in the acceptance of customer reviews. Trust was defined as a type of confidence or expectation towards review content (Gefen et al. 2003).

Consumers form specific attitudes towards a product after reviewing others' comments; however, comments may not be necessary or helpful for viewers (Dellarocas 2003). Scholz and Dorner (2013) defined review usefulness as comments that facilitate consumers in purchasing products that were suitable for their needs online. Wang and Strong (1996) developed a method for assessing information quality and discussed review usefulness. The researchers defined high-quality information as information that satisfied consumer needs and resolved specific problems. Information quality can be measured in four dimensions: intrinsic information quality, contextual information quality, representational information quality, and accessible information quality. The intrinsic information quality of reviews refers to review objectivity, reviewer's reputation, source believability, and content accuracy. Contextual information quality refers to added value, timeliness, amount of information, completeness, and relevance. Representational information quality refers to interpretability, compatibility, format, and coherence.

Many previous studies have adopted these dimensions to measure review usefulness. Schlösser (2011) confirmed that reviews with high interpretability were perceived as useful. Ghose and Ipeiritis (2011) found that reviews were perceived as useful when positive and negative comments were easily distinguishable, when the content was easy to comprehend, and when little effort was required to interpret the comments.

Black and Kelly (2009) examined story elements in reviews to assess their usefulness. The researchers asserted that viewers perceived reviews that contained story elements as useful, and explained that the consumption experiences of reviewers could be viewed as individual stories. Their findings revealed that reviews describing the motivation for their creation and presenting personal information, character development, detailed comments (i.e. regarding staff performance, hotel atmosphere, location, and services), a superior or motivational tone and well-written format, descriptions of service failure, and suggestions for failure recovery were helpful to viewers.

A number of previous studies have examined the usefulness of tourism websites. Findings have revealed that attitude affects use intention and perceived usefulness increases concurrently with trust (Muñoz-Leiva et al. 2012). Russell (2002) failed to validate the relationship between information recall and purchase intention. Purawirawan et al. (2012) argued that the lack of this relationship was the result of failing to account for the usefulness of information to consumers. This argument was validated after review usefulness had been considered. If a consumer perceives a review as useful, he or she subsequently recalls the positive or negative comments in the review. These recollections influence consumers' purchase intentions. In addition, perceived review usefulness influences attitude, which in turn affects purchase intention. The findings of related previous studies are given in Table 3.

Based on these findings, the following hypotheses were formulated:

H2 eWOM usefulness influenced the purchase intention positively.

H3 Risk avoidance was correlated with eWOM usefulness.

2.5 Effects of gender on preferences

Kotler et al. (2008) asserted that consumer behaviour was affected by many factors including eWOM, subjective norms, age, and gender. Cyr and Bonanni (2005) referenced sociolinguistic theory and asserted that gender differences characterized in the dimension of cultural background were a key factor influencing communication. Ulbrich et al. (2011) found that gender was a key factor influencing communication and online transaction behaviours in virtual communities. Gefen and Ridings (2005) observed significant differences between the communication models of men and women; women were more inclined to acquire or provide social support online. Yates (2001) noted that women commonly adopt a cooperation-based and network-oriented communication model. Dittmar et al. (2004) asserted that women's online transaction behaviours such as engaging in purchase behaviours prompted by advertisements are more likely to be affected by their emotions. Fan and Miao (2012) found that women valued privacy when using the Internet. A report published by the Consumer Protection Committee, Executive Yuan (1999), indicated that women value hardware and software in consumption environments, especially those related to safety and privacy. Garbarino and Strahlievitz (2004) agreed with this assertion, further highlighting that the risk involved in online transactions is the principal concern among women. Lockyer (2005) and Chiu and Wu (2002) maintained that women generally have higher awareness of

Table 3 The summary of consideration factors when consumer chooses hotel

Researchers	Source	Findings
Lin et al. (2010)	Survey	How does information reliability affect attitude? Considering the strength of web users' relationship (strong or weak) X evaluates (positive or negative) X product type (experience or trust). Based on experience, negative reviews will earn higher trust than positive review of users
Zehrer et al. (2011)	Survey	Review reliability will affect consumer's purchase intention
Pan and Chiou (2011)	Survey	Explained the use intention of travel website (e.g. Blog of Botanico Hotel, TripAdvisor, and Facebook). The usefulness, trust, and positive attitude will affect the continuance intention
Xie et al. (2011)	Survey	The source of word-of-mouth will affect continuance intention through perceived risk and trust
Zehrer et al. (2011)	TripAdvisor	Web user recognized that the consistency of evaluation reviews was useful. (The evaluation of Blog A and Blog B was consistence)
Scholz and Dorner (2013)	Amazon	Negative review did not reflect all things were bad (if web user read positive review followed by negative review).
Purnawirawan et al. (2012)	Survey	Useful reviews contained 9% adjective, talk about information of product characteristics, current review difference with previous. Objective reviews were useful for utilitarian product. Subjective reviews were useful for experience product
Zhang et al. (2010)	Survey	Understand the role of perceived usefulness. Recall memory of review information will affect consumers' attitude and intention when being aware that the review was usefulness
Black and Kelly (2009)	Yahoo! Travel Guides	The affect was positive review stronger than negative review when the consume goal was to promote product. On the contrary, the affect was negative review stronger than positive review when the consume goal was to prevent risk
Muñoz-Leiva et al. (2012)	Survey	The story elements contained in the reviews were helpful for web users

Source The authors

service quality than men. Powell and Ansic (1997) found that under similar economic conditions, women are more likely to engage in risk avoidance than men when managing their investments. Bae and Lee (2011) and Yang and Wu (2006) have argued that women have contributed significantly to the growth of online shopping; in particular, under the influence of virtual communities, women's engagement in online shopping has caught up with that of men.

Men use the Internet largely to elevate or secure their social positions (Awad and Ragowsky 2008). Men's communication and online transaction models are significantly more pragmatic than are women's (Yates 2001). A report published by the Consumer Protection Committee, Executive Yuan (1999), indicated that men value the product-related equipment and facilities and the consumption environments and have a higher tolerance for soft content (i.e. services). Chiu et al. (2002) asserted that men interact and communicate more with e-commerce providers and have a higher purchase frequency than women. The preceding discussion shows that gender differences are evident in online transactions and online purchases. Women value both hardware and software in consumption environments, whereas men focus more on hardware performance. Therefore, in the present study, a questionnaire survey was designed to investigate the difference between men and

women in online consumption trends and online purchase intention.

3 Research design

3.1 Instrument

3.1.1 Development

The research instrument employed in this study was developed based on the scales adopted by other studies based on Beaton et al.'s perspective (Beaton et al. 2000). The scale developed by this study comprised three factors, namely risk avoidance (three items) (Yeqing et al. 2003), review usefulness (four items) (Zehrer et al. 2011), and purchase intention (three items) (Xie et al. 2011), and contained 10 items across these three factors. A 7-point Likert scale was adopted, where 1.0 was the lowest score and 7.0 was the highest. After combining the scores for the various items, a high score indicated positive opinions and a low score indicated negative opinions.

Following the back-translation approach proposed by Brislin (1980), a researcher with a master's degree from an American institute was invited to translate the original English scale into Chinese. Subsequently, an American

researcher familiar with the Chinese language was invited to back-translate the Chinese translation into English. The source text and back-translated text were compared to verify the consistency of each item.

3.1.2 Validity and reliability

A total of 512 valid samples were obtained and then put into validity and reliability prior to data mining. For internal consistency, the overall scale achieved a Cronbach's α of .828. The Cronbach's α values for the dimensions of risk avoidance, review usefulness, and purchase intention were .846, .861, and .911, respectively, suggesting satisfactory reliability (Nunnally 1978). An analysis of the internal consistency coefficients showed that the coefficients of the overall scale and each of the three dimensions were all higher than .70, suggesting that the scale achieved excellent reliability.

A factor extraction method was employed to test construct validity. Principal component analysis was adopted as the extraction method and varimax with Kaiser Normalization was adopted as the rotation method, which assumes factor independence. Factors with eigenvalues greater than 1.0 and factor loadings greater than .4 were selected as the distinction criteria for factor dimensions. The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was used to determine the goodness of fit of factor analysis. This measure is a value denoting a comparison between the correlation coefficients and net correlation coefficients of all variables, where a high value denotes a strong correlation (Wu 2006). Kaiser (1974) stated that a coefficient of .60 was acceptable. The KMO value obtained in this study was .787, suggesting meritorious validity.

Bartlett's sphericity test was conducted to test the variance of the coefficients and whether they were greater than .0. The analysis results showed that Chi-square (χ^2) = 2914.969 ($p < .001$) and degrees of freedom (df) = 45, suggesting that the coefficients were suitable for factor analysis extraction (Wu 2006). The cumulative explanatory variance of the three factors was 76.976%. The explanatory variance percentages for risk avoidance, review usefulness, and purchase intention were 23.045%, 28.401%, and 25.530%, respectively. The explanatory variance was similar for the three dimensions, suggesting that the scale achieved excellent construct validity.

Composite reliability (CR) and average variance extracted (AVE) tests were conducted to determine convergent reliability. The results indicated that risk avoidance achieved CR = .849 and AVE = .652, review usefulness achieved CR = .865 and AVE = .620, and purchase intention achieved CR = .912; AVE = .775. All three dimensions met the test standards, suggesting that the scale

had excellent convergent reliability (Cai et al. 2012; Guo et al. 2008). For discriminant validity, the square root of the AVE for each factor needed to be greater than the correlation coefficient of the factor in question and other factors. The results indicated that risk avoidance achieved $r = .849$ and $\sqrt{\text{AVE}} = .807$, review usefulness achieved $r = .252$ and $\sqrt{\text{AVE}} = .787$, and purchase intention achieved $r = .184$ and $\sqrt{\text{AVE}} = .880$, suggesting that the scale had excellent discriminant validity (Cai et al. 2012).

3.1.3 The effectiveness of instrument

To do the data mining depends on the quality and characteristic of big data (Kumar et al. 2017). It combined both qualitative and quantitative data in a whole. However, most data from data warehouse or Internet were kind of homogeneous data or just a simple log record far from meaningful or purposeful data. Thus, a designed meaningful or purposeful survey becomes an essential approach to obtain summarized heterogeneous data (Carrasco and Villar 2012; Cai et al. 2012). Therefore, the purposeful instruments were developed depend on previous studies to achieve the goal of this research (Sparks and Browning 2011; Purnawirawan et al. 2012; Pan and Chiou 2011) and focused on the purpose of discover the Internet users' risk avoidance behaviour, eWOM usefulness, and purchase intention by gender perspective.

3.2 Framework

The framework of this study was set up via hypotheses as shown in Fig. 3. The risk avoidance influences the purchase intention as Hypothesis 1. The eWOM usefulness influences the purchase intention as Hypothesis 2. Then, the risk avoidance correlates with eWOM usefulness as Hypothesis 3. In addition, the control variables were age, education, and social level.

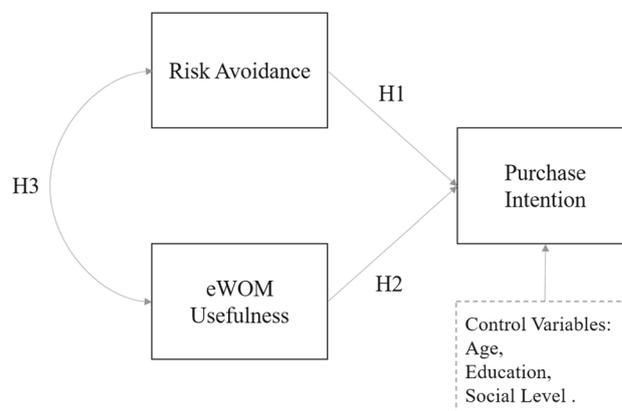


Fig. 3 The framework of research design

3.3 Procedure

3.3.1 Sample size

To gain reliable result by survey (Abramson and Abramson 1999; Adèr et al. 2008; Andres 2012), researchers comply with sampling criteria (Soper 2018; Cohen 1988; Westland 2010) prior to deciding sample size as: anticipated effect size at .8 (large), desired statistical power level at .8, the number of latent variables is 3 and the number of observed variables is 11 (risk avoidance consisted of 3 items, usefulness of eWOM is 5 items, purchase Intention is 3 items), probability level at .05. The recommended minimum sample size is 123 for each designed virtual reviews and survey A to D (see Table 4). According to recommended minimum sample size, this survey should gain 492 valid samples. Meanwhile, researchers apply a designed random survey mechanism to delivery URL of electronic questionnaire to participant's email for data collection. Result shows the feedback survey A is 142, B is 153, C is 127, and D is 90. The gained samples' size is higher than recommended minimum sample size.

3.3.2 Participants

A hybrid snowball and convenience sampling method was developed for data collection due to specified Internet users to be invited in this study. Participants were experienced, and they were used to review related information from related website and purchase commodity or service prior to checking reviews. The questionnaire was administered via email, and the respondents were asked to forward the questionnaire to their acquaintances. The survey period was 20 May–20 September 2016. A total of 520 questionnaires were recovered. After exclusion of invalid questionnaires, 512 questionnaires remained, yielding an effective return rate of 98.5%.

Among the respondents, 312 were women (60.9%) and 200 were men (39.1%); 403 had undergraduate degrees (78.7%), 97 had technical college degrees or lower (18.9%), and 12 had graduate degrees or higher (2.4%);

154 were aged 20 years or younger (30.1%), 325 aged between 21 and 30 years (63.5%), and 33 aged 31 years or older (6.4%). The average age was 22.8 years. In addition, 247 respondents were professionals (i.e. certified public accountants, lawyers, teachers, and engineers; 48.2%); 169 were students or housekeepers (33.0%), and 88 were other specialists, technical or nontechnical professionals, freelancers, or unemployed individuals (17.2%). Overall, the sample characteristics were suitable for examining the consumption capability of the younger generation. The findings of this study effectively reinforced previous inferences concerning the relationship between eWOM and purchase intention.

To minimize the effects of common method variance (CMV), the researchers enclosed instructions and confidentiality terms and conditions at the beginning of the questionnaire. No information that could identify individual respondents was collected. Furthermore, the research objectives and variable names remained undisclosed to the respondents to prevent expectation biases. Three reverse-coded questions were included in the questionnaire to check the respondents' attention levels (Peng et al. 2006; Podsakoff et al. 2003).

3.3.3 Process

A quasi-experimental design (Hirst and Kalmar 1987) was developed in this study. The questionnaire comprised four scenarios, namely "positive review–core content," "positive review–service content," "negative review–core content," and "negative review–service content." A scenario was randomly allocated to each respondent when the respondent filled the online questionnaire. A short description of the research objectives was provided at the beginning of the questionnaire. The respondents were instructed to imagine that they were in the process of choosing accommodation for a week-long vacation. An imitation of a real-world hotel review website was presented. The website contained hotel profiles, hotel information, an online booking system, and a review system. The respondents were instructed to read the hotel reviews

Table 4 Virtual electronic word-of-mouth reviews design

Reviews	Core	
	Positive	Negative
Service		
Positive	3 Positive service, 1 nature, 1 negative core (<i>Survey C</i>)	3 Negative core, 1 nature, 1 positive service (<i>Survey B</i>)
Negative	3 Positive core, 1 nature, 1 negative service (<i>Survey A</i>)	3 Negative service, 1 nature, 1 positive core (<i>Survey D</i>)

All designed reviews were positive or negative on core or service of hotel

and subsequently answer questions concerning material transfer, purchase intention, and personal habits and behaviours. They were then required to provide a set of information regarding personal demographics. To maintain intuitiveness in conventional written questionnaires, respondents were generally instructed to refrain from returning to items that they have already answered. Similarly, the back function on the electronic questionnaire in this study was disabled to enhance objectivity and minimize bias.

3.4 Control variables

Zakaria (2014) asserted that age and gender significantly interfered with eWOM and consumers' purchase behaviours. Hui-Yi and Pi-Hsuan (2010) also found that age, gender, educational level, and job level all influenced eWOM. This study focused on validating the interference effects of gender (Fan and Miao 2012). Therefore, age, educational level, and job level were set as the control variables to effectively examine the interference effects of gender and minimize data bias.

3.5 Design of eWOM

3.5.1 Framework

A number of studies have investigated consumers' pre- and post-purchase behaviours in the hotel industry. Post-purchase behaviour analysis primarily focuses on the hotel attributes that enhance consumer satisfaction. By contrast, pre-purchase behaviour analysis focuses on the attributes that consumers emphasize when selecting a hotel. The present study focused on pre-purchase behaviours, or in other words, the inclination among consumers to review eWOM before choosing a hotel. Therefore, the hotel attributes considered as necessities in the review content were first identified. According to Tables 2 and 3, different studies have selected slightly different attributes and thus have produced different results. To prevent biases stemming from referencing only one study, the researchers of the present study adopted the attributes most commonly used in previous studies. Attributes that appear in all related studies are those that are highly recognized among scholars, thereby reflecting their importance for consumers. The findings showed that safety, cleanliness, room comfortability, and staff services were the most common attributes in related previous studies. The first three of these attributes are core attributes, whereas the fourth is a service attribute. This study summarized the items previous researchers have included in specific attribute dimensions, selected relevant comments for these attributes, and attuned these attributes according to those commonly

mentioned by bloggers to design comment contents. eWOM content was designed based on the concepts of positive and negative WOM proposed by Purnawirawan et al. (2012), those of relationship strength proposed by Pan and Chiou (2011), and the eWOM framework designed by Sparks and Browning (2011) (Table 4). This content was provided as reading material for the respondents before answering the questionnaire.

It was difficult to discover the users' awareness regarding the positive or negative eWOM by traditional questionnaire. Therefore, this study used a designed different type of survey with positive or negative descriptions of eWOM and involved the strength of those designed eWOMs. Thus, the blind spot of traditional survey to be conquered by this research design. Further, a new insight of internet users' perspective to be highlighted in opinion difference of gender.

Customer reviews vary widely in terms of writing style. Lee et al. (2007) analysed consumer reviews from the perspective of information quality, specifying that consumer reviews should be assessed on the basis of their relevance, understandability, reliability, and sufficiency. Relevance assesses whether consumers' evaluations are consistent with their demands. When consumers generate a negative perception of a hotel, they should clearly describe what aspect or aspects of their experience failed to meet their expectations rather than providing emotional statements such as "this hotel is lousy." Understandability assesses whether a review's wording is easy to understand and whether the information is reliable and trustworthy. Sufficiency assesses whether detailed descriptions of the product are provided. Therefore, the preceding criteria were adopted during the design of the reviews in the present study.

The present study adopted the word-count design proposed by Lin et al. (2013), who examined the effects of book reviews on consumers' purchase decisions. The researchers primarily focused on the number of reviews, word count, number of negative reviews, and order of negative reviews. The findings revealed that relatively long reviews facilitate decision-making, but excessively long reviews reduced information usefulness. Tsao (2014) analysed the influence of WOM on movie reviews. The results of a focus group interview revealed that 100–300 words were a sufficient length for a reviewer to express his or her opinions. Reviews should be between 5 and 10 lines and arranged in neat paragraphs. Because the present study adopted descriptive reviews, to maximize the effects of storytelling elements, the reviews were written in roughly 300 words and arranged as 10 lines.

Four different types of questionnaires (A–D) were developed based on the review content (core/service attributes) and review evaluations (positive/negative). A pretest

was conducted to validate the independent variables; moreover, respondent suggestions were collected using open questions. The questionnaires were then revised and adjusted based on these suggestions to enhance the clarity of the item structure and confirm the discrimination between review content and review evaluations. The adjusted questionnaire was used for the official survey. Questionnaires were administered physically and online.

Core content presented in online reviews refers to explicit conditions such as hotel location, transportation convenience, and hardware facilities and equipment. Service content refers to services provided by hotel staff such as front desk service, check-in service, and room service. The review content in the questionnaire was designed based on several criteria, including positive or negative comments, relationship strength, and the review framework. Positive, negative, and neutral eWOM reviews of hotels on TripAdvisor (<https://www.tripadvisor.com.tw/>) which were collected and randomly arranged into a list of eWOM reviews. The respondents were instructed to read these reviews before answering the questionnaire.

3.5.2 Description of eWOM

Based on the extant literature (Tsao 2014), three review presentation strategies were used. The first strategy was situational; a scenario was presented to the respondent, who answered a set of questions after reading the review included in the scenario. The second strategy was imitational; a fictitious review website was presented to the respondent. Hotel images were blurred, and their names were changed to prevent the respondents from relying on brand recognition. The respondents were required to answer a set of questions after reviewing the website. The final strategy was a combination of the first two strategies; a scenario was created for the respondents before a fictitious review website was presented. The respondents were required to review the scenario and website before answering a set of questions. This final strategy was adopted to enhance the authenticity of the survey. A description was first provided to the respondents to help them form a scenario. Subsequently, a fictitious website was presented to enhance the credibility of the review. A survey conducted on the world tourism market in London in 2010 indicated that 36% of consumers searched for travel information on websites such as TripAdvisor, Facebook, travel discussion forums, YouTube, Twitter, and blogs. Among these websites, TripAdvisor was the most popular for this purpose. TripAdvisor contains a vast amount of online reviews and information and was visited by approximately 400 million travellers every month. It has over 200 million registered users and provides over 500 million reviews (Muñoz-Leiva et al. 2012). The website contains a vast amount of voluntary

consumer reviews with real experiences, and thus, many researchers have used data from TripAdvisor for content-based quantitative research.

In summary, TripAdvisor is a large and popular review website that had been used for practical and academic purposes. Therefore, the presentation format of TripAdvisor was used to create the eWOM reviews in this study.

4 Results

4.1 Distribution of observations

The mean, median, standard deviation, variance, skewness, standard error of skewness, kurtosis, and standard error of kurtosis are given in Table 5. The skewness of “risk avoidance”, “usefulness of eWOM”, and “Purchase Intention” were near 0 ($-.380 < SK < -.0363$) that comply with normal distribution; moreover, the kurtosis of factors was near 0 ($-.095 < KU < .394$) that comply with normal distribution as well.

4.2 Correlations

The mean values, standard deviation values, and correlation coefficients of the research variables and control variables are given in Table 6. The analysis results indicated that risk avoidance achieved significant and positive correlations with WOM usefulness ($r = .363, p < .01$) and purchase intention ($r = .177, p < .01$), and WOM usefulness achieved a significant and positive correlation with purchase intention ($r = .243, p < .01$). These results confirmed the existence of strong correlations between the main factors. To prevent the collinearity between independent variables from influencing the explanatory power of the explanatory variables, the variance inflation factor (VIF) was employed to test collinearity. Factors with VIF values lower than 10 denoted that collinearity was within the acceptable range (Belsley 1991; Bowerman and O’Connell 1990; Neter et al. 2004; Pedhazur 1997; Yu 1989). The regression analysis results revealed that the VIF values for risk avoidance and WOM usefulness were 1.157 and 1.155, respectively, both of which were far lower than the standard VIF value of 10.0. These results confirmed that no significant collinearity was present among the predictive variables.

4.3 Prediction

4.3.1 Overall prediction model

The hierarchical regression analysis results after coefficient standardization are given in Table 7. After eliminating the

Table 5 Statistic results of observations (n = 512)

The central tendency	Risk avoidance	Usefulness of eWOM	Purchase intention
Mean	4.722	4.803	4.269
Median	4.667	5.000	4.333
Standard deviation	1.188	1.245	1.313
Variance	1.411	1.549	1.723
Skewness	− .363	− .380	− .376
SE of skewness	.108	.108	.108
Kurtosis	.394	− .095	− .037
SE of kurtosis	.215	.215	.215

Table 6 Summary of mean, standard deviation, and correlation coefficients of variables (n = 512)

Variables	Mean	SD	1.	2.	3.
Risk avoidance	4.72	1.19	(.846)		
Usefulness of eWOM	4.80	1.24	.363**	(.861)	
Purchase intention	4.27	1.31	.177**	.243**	(.911)

1. () is Cronbach's α values; 2. two-tailed test; 3. education and social level is ordinal scale; ** $p < .01$

control variables, the coefficients for risk avoidance ($\beta = .122, p < .01$) and WOM usefulness ($\beta = .200, p < .001$) both achieved statistical significance ($R^2 = .115; \Delta R^2 = .106; p < .001$). Thus, H1 and H2 were supported. In other words, risk avoidance and WOM usefulness positively predicted the purchase intention of the overall sampled respondents.

4.3.2 Effects of gender on preferences

Analysis results of questionnaires filled by respondents of different genders indicated that after eliminating the control variables, the responses of only two types of questionnaires achieved statistical significance. The questionnaires centred on “negative core” eWOM (B) and “negative service” eWOM (D) failed to significantly predict purchase intention. This study inferred that after the respondents read highly negative eWOM and reviews, their purchase intention for core content and service content was unaffected from both the perspectives of risk avoidance and WOM usefulness.

The results of the “positive core” eWOM questionnaire (A) indicated that risk avoidance and WOM usefulness positively influenced purchase intention among the male respondents ($\beta_{\text{risk avoidance}} = .283, p < .05; \beta_{\text{WOM usefulness}} = .527, p < .001$) and the female ($\beta_{\text{risk avoidance}} = .236, p < .05; \beta_{\text{WOM usefulness}} = .296, p < .01$) respondents. The standardized regression coefficients indicated that the extent of influence on female respondents was slightly lower than that of male respondents. The results of the

Table 7 Standardized coefficients summary of hierarchy regression analysis

Variables	Purchase intention							
	Survey A		Survey B		Survey C		Survey D	
	Male	Female	Male	Female	Male	Female	Male	Female
Control variables								
Age	− .128	− .273**	− .084	− .140	− .112	.109	− .707	− .441
Education	.060	.148	.104	.218*	− .008	.044	− .168	.068
Social level	.254*	.218*	− .262	− .100	− .049	.108	− .259	− .187
Predict variables								
Risk avoidance	.283*	.236*	.152	− .100	.128	.259*	.080	− .015
Usefulness of EWOM	.527***	.296**	.164	− .087	.488**	.387**	− .044	.149
R^2	.744***	.318***	.168	.123	.311**	.293***	.458	.287
ΔR^2	.553***	.277***	.091	.072	.233**	.243***	.370	.211

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

“positive service” eWOM questionnaire (C) indicated that the risk avoidance and WOM usefulness coefficients of the female respondents ($\beta_{\text{risk avoidance}} = .259, p < .05$; $\beta_{\text{WOM usefulness}} = .387, p < .01$) positively influenced their purchase intentions. By contrast, the risk avoidance coefficients of the male respondents failed to influence their purchase intentions ($\beta = .128, p > .05$). Only WOM usefulness coefficients could positively predict the purchase intentions of the male respondents ($\beta = .488, p < .01$).

5 Discussion

The findings of this study were consistent with those of previous studies. Specifically, risk avoidance positively influenced purchase intention (Hennig-Thurau and Walsh 2004; Xie et al. 2011; Manickas and Shea 1997; Hennig-Thurau et al. 2004; McCleary and Weaver 1993; Sparks and Browning 2011; Powell and Ansic 1997; Chiu et al. 2002). This finding suggests that consumers' risk avoidance behaviours influenced their willingness to book hotel rooms online. The findings of this study also supported the hypothesis that eWOM usefulness influences purchase intention (Lockyer 2005; Scholz and Dorner 2013; Schlösser 2011; Ghose and Ipeirotis 2011; Black and Kelley 2009; Muñoz-Leiva et al. 2012), which suggests that perceived eWOM usefulness helps consumers to make decisions related to online products (i.e. hotels) and influences their willingness to book hotel rooms online. Finally, the correlation analysis results indicated a significant correlation between eWOM usefulness and risk avoidance (Xie et al. 2011; Chiu et al. 2002; Russell 2002), suggesting that eWOM usefulness and risk avoidance have a positive correlation.

The results of questionnaire analysis for gender-based groups and different WOM frameworks indicated that risk avoidance and eWOM usefulness positively predicted the purchase intentions of the male and female respondents of questionnaire (A). In questionnaire (C), risk avoidance and eWOM usefulness positively predicted the purchase intentions of only the female respondents, whereas only eWOM usefulness predicted the purchase intentions of the male respondents. Service performance comprises core services and service encounters (Bitner et al. 1990). Consumers' perceptions and preferences differ depending on their gender. The analysis results of the present study clearly show that negative eWOM failed to affect the purchase intentions of men and women. However, positive eWOM influenced purchase intentions, particularly those of the female respondents in the service-based questionnaires, because the female respondents valued the environments and services. By comparison, men only value hardware highly. Therefore, risk avoidance failed to affect

the purchase intentions of the male respondents of the service-based questionnaires. Only eWOM usefulness achieved favourable predictive performance.

5.1 Practical implications

Overall, positive eWOM was the main factor that influenced consumers' product purchase intentions. Therefore, practical business operations, well-maintained equipment and facilities, and service quality are fundamental elements of marketing (Chu and Choi 2000; McColl-Kennedy and White 1997). A gender comparison revealed that women were more likely to be influenced by advertisements and WOM and change their purchase decisions than were men (Yates 2001). In addition, women were more sensitive to service quality than were men (Chiu et al. 2002; Chiu and Wu 2002). Therefore, considering gender differences is essential in creating positive eWOM. In addition, core services and service encounters can be differentiated to elucidate gender differences.

5.2 Limitations

Random sampling could not be conducted in this study because of limitations in terms of funding, time, participation willingness, and sample size. Therefore, convenience sampling and snowball sampling were adopted for sample collection. Although the researchers aimed to recruit samples from all age groups, most respondents (93.5%) were under the age of 30. This was expected because the Internet is more popular among younger people. Although samples should reflect actual user conditions, recruiting more users over the age of 30 would likely produce more robust results concerning eWOM behaviour.

Data that originate from a single source may cause single-source biases (Podsakoff et al. 2003). In the present study, the research variables were individuals' subjective perceptions. Therefore, a self-evaluated approach was adopted for data collection (Avey et al. 2010). To prevent CMV, respondents' personal details were not recorded and the research objectives and variable names were not disclosed to the respondents. In addition, several reverse items were incorporated into the questionnaire to minimize the risk of CMV.

The eWOM scenarios applied in this study were designed based on the positive and negative WOM concepts proposed by Purnawirawan et al. (2012) combined with the relationship strength concepts proposed by Pan and Chiou (2011) and the eWOM framework developed by Sparks and Browning (2011). Although these researchers attempted to create eWOM descriptions that were consistent with real-world content as suggested by Lin et al. (2010, 2013), slight differences may still exist between the

positivity and negativity, intensity, and tonality of the fictitious content and real-world content.

5.3 Suggestions for future research

Future studies could expand the sampling population and recruit Internet users with a broader range of personal characteristics. Future studies could also include more varied samples from both genders to obtain more concrete evidence concerning the purchase decisions and online shopping models of men and women. A random item allocation mechanism could be adopted to prevent CMV. In addition, completely positive and completely negative WOM reviews could be designed to elucidate Internet users' determination of eWOM intensity and directionality. Besides, related studies were employed survey method to retrieve purposeful and meaningful data for such topic discussions (Cyr and Bonanni 2005; Ulbrich et al. 2011; Gefen and Ridings 2005; Yates 2001; Nadiri and Gunay 2013; Ziebell et al. 2019; Priyadarshinee 2018). Therefore, the specified objective oriented survey was necessary for empirical study use, especially for human factors (Fabisiak 2018; Avdic 2018; Huang 2017). Moreover, the researchers found that gender plays an essential role in eWOM and the finding was slightly different from previous studies (Zakaria 2014; Hui-Yi and Pi-Hsuan 2010). In addition, it was suggested that the online purchase intention and risk avoidance behaviour should be compare by different generation or gender, those data should be collected via eWOM in the future study.

Compliance with ethical standards

Conflict of interest The authors have declared that no competing interests exist.

Human and animal rights This article does not contain any studies with human participants performed by any of the authors.

Data availability statement All data are in this paper.

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