



The Effect of Electronic Word-of-Mouth upon Purchasing Cell Phone on the Internet

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Authors' contributions

This research was carried out in collaboration between all authors. All authors discussed and designed the study. Author YCC was also responsible for analyzing the data. Meanwhile, authors RYW and JHW revised the final manuscript. All authors read and approved the final manuscript.

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ABSTRACT

This research has divided the consumer shopping behaviors into pre- and post-purchase models in order to conduct a further discussion. Product attributes, gathering Electronic Word-of-Mouth (eWOM) and pre-purchase customer satisfaction are included in the pre-purchase model, and the post-purchase model covers product attributes, spreading eWOM and post-purchase customer satisfaction. A structural equation model (SEM) is built to analyze the differences. The results reveal that: (1) Product attributes have significantly and positively influenced both eWOM (gathering positive and negative eWOMs before purchasing, and spreading positive and negative eWOMs after purchasing) and post-purchase customer satisfaction; (2) The positive eWOMs gathered before purchasing have positive significant effects on pre-purchase customer satisfaction; (3) The post-purchase customer satisfaction exerts positive significant effects upon spreading positive eWOMs and has negative significant effects on spreading negative eWOMs; (4) In the pre-purchase framework, gathering information on eWOMs has a full mediation effect, and it shows the customer satisfaction has a partial mediation effect in the post-purchase framework.

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1. INTRODUCTION

The technology today allows the telecommunication industry growing rapidly, which makes using cell phones become increasingly common. According to Taiwan National Communication Commission, the total Taiwan cell phone subscriptions by the second quarter of 2010 were 27.17 millions (1.17 subscriptions per person), and the total subscriptions were 28.29 millions by the second quarter of 2011 (1.22 cell phones in-use per person), which showed an increase of 160,000 subscriptions compared to the previous quarter and a growth of 1.12 millions within one year [1]. Based on these numbers, Taiwan's telecom market certainly has immense potential. In addition, Taiwan FIND [2] revealed the number of Internet users in Taiwan had swelled from 9.76 millions (penetration rate: 43%) in December of 2006 to 10.88 millions (penetration rate: 47%) in June of 2011, which implies that Internet definitely plays an important role in Taiwan people's daily life.

Internet has changed the way how consumers obtain information before making a purchase. In the past, consumers got the latest information mainly by exchanging knowledge with their kin and friends and knowing from traditional media. However, most of consumers today gather and exchange information through online media tools, such as e-mails, newsgroups, online forums, industry portal discussion areas, bulletin boards systems, Multi-User Dungeons (MUD, multiplayer online role-playing game), chat rooms, blogs and discussion forum etc. The online communication can be instant, multipleuserdialogue, convenient, anonymous, and free from geographic and time constraints [3].

Using cell phones and Internet has become widely popular these days, and such phenomenon pushes cell phone manufacturers to come up with new models and functions constantly in the hope of attracting consumers and meeting their needs. Through expectancy theory, Mittal et al. [4] studied how the performances of product and service attributes influence the satisfaction. The result has indicated that there is an asymmetric correlation between attribute performances and the satisfaction. Based on this finding, this study further explored the relationship between product attributes and customer satisfaction, which is one

of the motives of this research. With the rapid Internet development, consumers get used to gathering information on Internet. Synovate Report [5] found that nearly 60% of the consumers in Taiwan obtained information about consumer electronics on Internet; moreover, the empirical study by Doh & Hwang [6] suggested that consumers would google the product information and feedbacks of other users online before shopping. On these grounds, Internet and eWOMs indeed have become important reference resources for consumers before making purchase decisions. Hanson [7] proposed that the influence of eWOM goes faster and spreads more widely compared to the traditional Word-of-Mouth (off line) approach. Besides, TARP's research [8] on Coca Cola discovered that a satisfied customer would spread positive WOMs to 4 to 5 people, but a dissatisfied customer would spread negative WOMs to over 9 people. On the basis of this interesting finding, customer satisfaction definitely affects the effectiveness of WOM, and the impacts of negative WOMs might be greater than the positive ones. Accordingly, this research would probe into the connections between customer satisfaction and eWOMs, which serves as the second motive.

In addition, Chen, Chang, and Hsiao [9] demonstrated that value-added service and customer satisfaction have a significantly positive effect on electric word-of-mouth. Lim [10] indicated that Internet advertising (IA) and electronic word of mouth (EWOM) have a positive effect on consumers' perceived value (PV) and perceived risk (PR) of using online group buying (OGB) sites, which in turn have a significant influence on their intentions to shop at OGB sites; meanwhile, a significant relationship also emerges between IA and EWOM. Chen, Teng, Yu, and Yu [11] showed that online brand-related information from the three sources (eWOM, Neutral/Third Party, and Manufacturer/Retailer) has a positive influence on consumer attitude toward the brand and purchase intention. Baber, Thurasamy, Malik, Sadiq, Islam, and Sajjad [12] indicated that speaker's trustworthiness and experience have significant and positive effect on online word-of-mouth, and online word-of-mouth has significant and positive effect on attitude, but no effect on purchase intention. Wang, Lin, Chen, and Lin [13] illustrated that Website quality has significant and positive effect on users' cognitive trust and

eWOM respectively; however, users' cognitive trust has negative effect on eWOM. Hussain, Ahmed, Jafar, Rabnawaz, and Jianzhou [14] demonstrated that eWOM has positively influenced on perceived risk. From these previous studies, we can find that there are three gaps: First, for the antecedents, they seldom discuss the product attribute; however, for a product, product attribute is having a long-term value. Second, for the dependent variables, they always discuss the post-satisfaction; however, customers should gather eWOM before they buy the product. It is important for improving the decision-making quality and increasing the post-satisfaction. Third, they seldom discuss the mediating effect of eWOM. According to these gaps, this study will do the further discussion.

To summarize, the main purposes of this study is exploring the relationship among product attributes, eWOM, and customer satisfaction, and the objectives are as follows: (1) To discuss how the degree of consumer valuing product attributes influences consumers's behaviors of gathering eWOMs; (2) To explore how eWOM gathering influences pre-purchase customer satisfaction; (3) To examine how the degree of consumer valuing product attributes exerts influences on pre-purchase customer satisfaction; (4) To study whether gathering eWOM gives any mediation effects in the pre-purchase framework; (5) To see how the degree of consumer valuing product attributes affects eWOM spreading; (6) To research how post-purchase customer satisfaction affects eWOM spreading; (7) To discuss how the degree of consumer valuing product attributes influences

the post-purchase customer satisfaction; (8) To explore whether the post-purchase customer satisfaction gives any mediation effects in the post-purchase framework; (9) It is hoped that the empirical results would be helpful for cell phone manufactures in developing business policies and marketing strategies.

2. LITERATURE REVIEW

2.1 Electronic Word-of-Mouth (eWOM)

2.1.1 Definition and types

Via Internet, people could convey the feedbacks and opinions of using a product or service to other consumers online and form the so-called "electronic word-of-mouth", also know as "online word-of-mouth" [15,16]. Westbrook [17] defined it as "by using Internet-based technologies, informal communications directed at other consumers about the ownership, usage, or characteristics of particular goods and services and/or their sellers."

Many types of electronic platforms would influence interpersonal relationship. The process in each type has its own particular characteristics. Some are simultaneous, such as instant messaging, and some are asynchronous, such as emails and blogs. Some communication is done by one to one, but some is one to many. Some communication would be many-to-many, which is carried out in the on-line chat rooms [18]. The eWOM channels that Litvin et al. [19] has proposed are as shown in the Fig. 1.

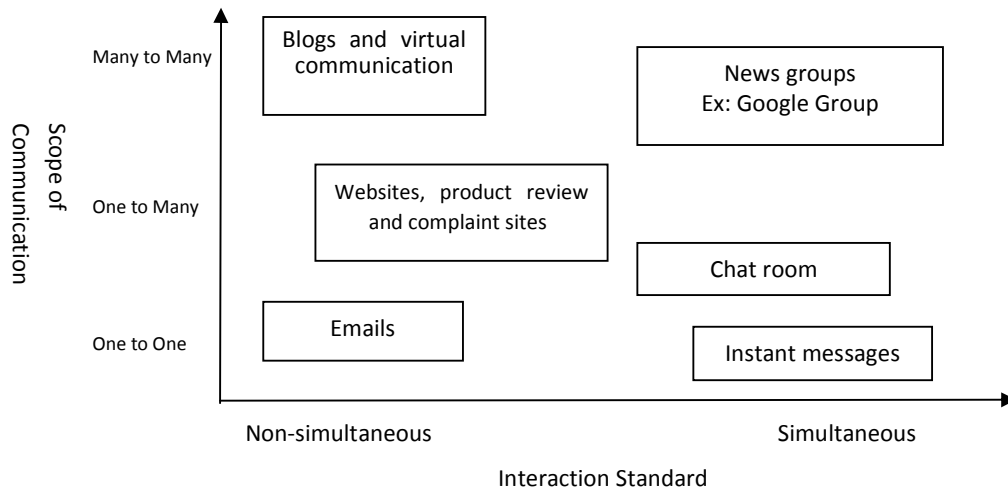


Fig. 1. Typology of eWOM Channels

Source: [19]

2.1.2 Differences between WOM and eWOM

With the rapid growth of Internet, WOM is no more confined to the physical face-to-face oral communication. The emergence of eWOM has turned information exchanging activities from traditional offline means, such as oral transmission, sound, body language, into digitalized and multi-media communication. Besides, the unique nature of eWOM permits the communication not to be constrained by location and time. Tanimoto and Fujii [20] also pointed out that, via Internet, the spreading of WOM will be vented at a faster speed, to a wider extent, and the subjects will be more liberal; furthermore, the effects of dissemination would far surpass the traditional offline WOM means. This research has listed the differences between eWOM and traditional WOM as exhibited in Table 1.

2.2 Product Attribute

2.2.1 Definition and characteristic

“Product attribute” is the product characteristics that consumers have perceived. Based on different needs and motives, each individual would hold different attitudes toward the characteristics of a same product and evaluate the characteristics differently [21]. Product attribute consists of various explicit and implicit characteristics and natures of a product, which can be perceived by consumers. Each product actually is formed by a set of attributes, such as appearance, functions, price, brand and so on [22]. For a product, product attribute is having a long-term value. Chiou [23] indicated that product

attribute usually is based on customer satisfaction, is a source for sustainable competitive advantage (SCA), is marketing leading research and development, and is qualified for owning developer rights.

2.2.2 Type

Scholars hold different opinions on the classification of product attributes; therefore, the ways to classify them are varied.

2.2.2.1 Classified by needs

Park et al. [24] classified the consumer needs as functional needs, experiential needs, symbolic needs etc. Furthermore, if product attributes are designed primarily to satisfy consumer needs, based on different types of needs for attributive satisfaction, the product attributes can be classified as utilitarian attributes [25], hedonic attributes [26] and symbolic attributes [24]. If the product attributes is to satisfy various levels of consumer needs, Lo [27] has classified the product attributes as basic function attribute (also known as primary attribute and hard attribute), convenience function attribute (also known as secondary attribute), and psychological satisfaction attribute (also known as soft attribute or symbol attribute).

2.2.2.2 Classified by products

Lefkoff-Hagius and Mason [28] pointed out that when evaluating the going-to-buy product, consumers tend to classify the product attributes as product characteristics, product benefit and social image.

Table 1. Differences between WOM and eWOM

	eWOM	WOM
Media	Internet, including World Wide Web, email, Bulletin Boards System, news groups, Instant Messenger	Face to face, phone
Form	Digitalized, multimedia (texts, pictures, streaming media etc.)	Oral, sound, body language, gestures
Objects	Extensive (acquaintances and strangers)	Acquaintances only
Characteristics	Simultaneous and non-simultaneous Commercial and non-commercial	Simultaneous Non-commercial
Reliability	Relatively low	Relatively high
Spreading speed	Fast	Slow
Interaction	One to one, one to many, many to many	One to one
Message interaction	Cue-triggered	Self-determined
Time and spatial limit	No limit	Limited
Trust and attitude of crowd	Tend to be skeptical	Trustworthy
Effectiveness and cost	Highly effective	High cost

Source: [29]; [30]; [31]; [32]

2.2.2.3 Classified by product performance

Chiou [23] suggested that the product attribute is a combination of a product's explicit and implicit characteristics and natures. The included product attributes are essential attribute, formal attribute, perceived attribute and augmented attribute.

2.2.2.4 Classified by product benefit

Aaker [33] classified product benefits as functional benefit, emotional benefit and self-expressive benefit.

2.2.2.5 Classified by benefit chain

Young and Feigin [34] have proposed the "Grey Benefit Chain" and classified the product benefits as functional benefit, practical benefit and emotional pay-off.

2.3 Customer Satisfaction

Cardozo [35] pioneered the researching of customer satisfaction. Cardozo [35] suggested customer satisfaction is a function of expectation for products and the obtained product performance. If the performance is beyond consumers' expectation, the consumers would thus feel well satisfied and vice versa. Hunt [36] proposed that customer satisfaction is an integration of the fulfillment of various needs, the delight, the interaction between expectation and performance, an evaluation of purchasing and consuming experiences, a consumption benefit evaluation, a comparison between actualities and expectations as well as the obtained insufficient and surplus attributes in a purchase. Hempel [37] defined that customer satisfaction is the achieved level of the products and service benefits that customers had expected, which means the consistency of expectation and the real effect. Oliver [38] argued that customer satisfaction is the expectancy disconfirmation of expectation and actual perception. Churchill and Surprenant [39] viewed the customer satisfaction as a post-purchase output. If the actual product performance is equal to or greater than the pre-purchase expectation, the consumer would feel satisfied and vice versa. Tse and Wilton [40] suggested that customer satisfaction is a response to the discrepancy between a consumer's prior expectations and his or her perception of the actual performance regarding the purchase. Westbrook and Oliver [41] defined the customer satisfaction is a result arising from comparing their criteria with the product's or

service's performance quality or their perception. Ganesh et al. [42] deemed that the customer satisfaction is a function of the discrepancy between a consumer's expectations and his or her perception, and the criterion is the pre-purchase expectation. Chiou et al. [43] the customer satisfaction is the whole or accumulated satisfaction. Kotler and Armstrong [44] defined the customer satisfaction would be determined by whether the product's functional features meet consumer expectation. If the features fail to meet the consumer expectation, the consumer will not feel satisfied and vice versa.

To summarize, customer satisfaction is the psychological status after a consumer making a product or service purchase. Such psychological status is a comparison between the pre-purchase expected performance and the post-purchase actual performance. If the expected performance is greater than the actual performance, consumers will feel unsatisfied and vice versa.

3. FRAMEWORK, HYPOTHESIS, AND DESIGN

3.1 Framework and Hypothesis

Yang et al. [45] has indicated that customer satisfaction is the foundation of WOM, and customer satisfaction not only acts as the direct factor of increasing WOM amounts, but gives an amplifying effect on marketing campaigns. This study applied this finding as the base of the research structure development. In order to explore the eWOM's influence on consumer purchase decision, the research framework is divided into two parts, "the behaviors of gathering WOM before purchasing" and "the behaviors of spreading WOM after purchasing" (Fig. 2), and further to discuss their differences. The hypotheses are as follows.

H1: The degree of consumers' valuing the product attributes would have effects on gathering-eWOM activities.

H1a: It will increase the activities of gathering positive eWOM if consumers highly valuing the product attributes.

H1b: It will increase the activities of gathering negative eWOM if consumers highly valuing the product attributes.

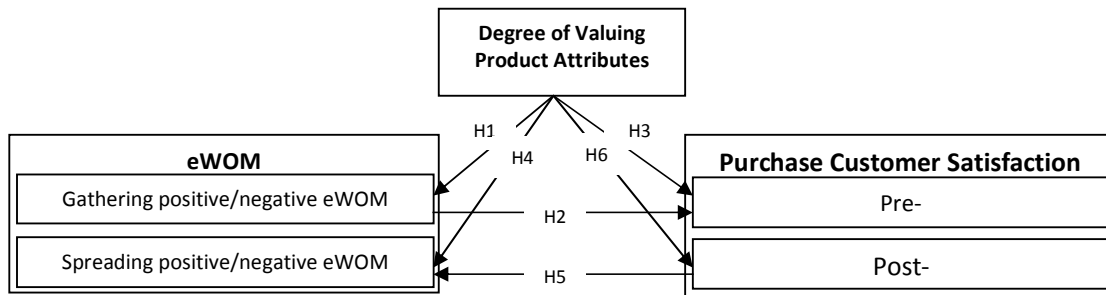


Fig. 2. Framework

H2: The gathering-eWOM activities have effects on consumers' pre-purchase customer satisfaction.

H2a: The activities of gathering positive eWOM would increase consumers' pre-purchase customer satisfaction.

H2b: The activities of gathering negative eWOM would decrease consumers' pre-purchase customer satisfaction.

H3: The degree of consumers' valuing the product attributes would have effects on the pre-purchase customer satisfaction.

H4: The degree of consumers' valuing the product attributes would have effects on spreading-eWOM activities.

H4a: Consumers' highly valuing the product attributes would increase the activities of spreading positive eWOM.

H4b: Consumers' highly valuing the product attributes would increase the activities of spreading negative eWOM.

H5: Post-purchase customer satisfaction would affect eWOM spreading behaviors.

H5a: Increasing post-purchase customer satisfaction would increase activities of spreading positive eWOM.

H5b: Increasing post-purchase customer satisfaction would reduce activities of spreading negative eWOM.

H6: The degree of consumers' valuing the product attributes would have effects on the post-purchase customer satisfaction.

3.2 Definition of Variables and Measurement Items

3.2.1 eWOM

Westbrook [17] defined the eWOM as by using Internet-based technologies, informal

communications directed at other consumers about the ownership, usage, or characteristics of particular goods and services and/or their sellers. As the power of eWOM constantly expands, potential buyers would always refer to other buyers' reviews of a particular product before making a purchase [6]. According to the delivered words of WOM, it is classified as positive WOM and negative WOM. On these bases, this study has defined the eWOM as "the activities of gathering/spreading positive or negative WOM by using Internet." Regarding measuring eWOM, we grouped it into four parts: "Gathering positive eWOM", "Gathering negative eWOM", "Spreading positive eWOM" and "Spreading negative eWOM" (Table 2). In addition, this study has adopted the 6-point Likert scale to measure how consumers attach importance to an item ("1" represents "Completely Disagree" and "6" indicates "Completely Agree").

3.2.2 Product attribute

"Product attribute" is how consumers view a product. Whether tangible or intangible, everything can be categorized as product attribute as long as it has connection with the product. It can be a concept, a personal service, a characteristic or all of above [46]. Thus, this research defined it as "the elements which a cell phone presents, such as appearances and functions, and such elements are the main reasons for consumers to make a cell phone purchase." The measurement items are as Table 3. In addition, this study has adopted the 6-point Likert scale to measure how consumers attach importance to an item ("1" represents "Completely Disagree" and "6" indicates "Completely Agree").

3.2.3 Customer satisfaction

Tse and Wilton [40] defined that customer satisfaction is a response to the discrepancy

between a consumer's prior expectations and his or her perception of the actual performance regarding the purchase. Accordingly, this study defined the customer satisfaction as "the psychological status after a consumer purchasing a product or service. This psychological status is a comparison between the expected product performance before purchasing and the actual product performance after purchasing."

Table 2. Measurement items of eWOM

Aspect	Item	Reference
Gathering positive eWOM	1. I believe sufficient information is provided on Internet.	[47]
	2. If not having sufficient knowledge on the going-to-buy cell phone, I would google some positive information online.	
	3. Before buying a cell phone, I would refer to the on-line users' experiences and positive feedbacks about the cell phone.	
	4. I would gather the information about positive experiences from on-line users.	
	5. If there are positive articles about a brand's cell phones, I would have good impression on cell phones of that brand.	[48], [49], [43]
	6. If there are some feedbacks about a brand's cell phones equipped with diversified and practical functions, I would have good impression on that brand's cell phones.	
	7. In general, if on-line users give positive feedbacks to a brand's cell phones, it would affect my purchase inclination.	
Gathering negative eWOM	1. When buying a cell phone, I would refer to online users' experiences and negative feedbacks to the brand's cell phones.	[47]
	2. If having read negative articles about a brand's cell phones, I would have negative impression on that brand's cell phones.	[48], [49], [43]
	3. If the online reviews are about that brand's cell phones are merely with mediocre functions and not really functional, I would not favor that brand's cell phones.	
	4. In general, if on-line users give negative feedbacks to a brand's cell phones, it would affect my purchase inclination.	
	5. I would have done massive googling to obtain the needed negative eWOM to prevent myself from buying this cell phone.	[50]
Spreading positive eWOM	1. I often talk about the strong points of this brand's cell phones to others online.	[45]
	2. The times I mentioned about the strong points of this brand online are obviously more than other similar brands.	
	3. I took every single opportunity to recommend others buying cell phones from this brand.	
	4. When mentioning this brand, I would talk about this brand's positive details.	
	5. Once starting discussing this brand, it is hard for me to stop sharing.	
	6. I usually write something positive about this brand online.	
	7. I am proud of my cell phone and its brand.	
Spreading negative eWOM	1. I would tell others about this cell phone's shortcomings online.	[51]
	2. I will discourage others online from buying this cell phone.	
	3. I would not recommend this cell phone to others.	[52]
	4. I often write negative reviews about this brand on Internet.	[45]
	5. When mentioning this brand's cell phones, I would tell others about their negative details.	

Table 3. Measurement item of product attribute

Item	[53]	[54]	[22]	This study
1. Connecting quality	✓	✓	✓	✓
2. Long battery life	✓	✓	✓	✓
3. Simple to use	✓	✓	✓	✓
4. Intuitive user interfaces	✓	✓	✓	✓
5. Easy to carry	✓	✓	✓	✓
6. Price	✓	✓	✓	✓
7. Novel appearance	✓	✓	✓	✓
8. Cool product color	✓	✓	✓	✓
9. Easy maintenance	✓	✓	✓	✓
10. Convenient for data transfer	✓	✓	✓	✓
11. Large storage capacity	✓	✓	✓	✓
12. With many special functions	✓	✓	✓	✓
13. Cell Phone Brand	✓	✓	✓	✓
14. Call Setup Success Rate	✓	✓	✓	✓
15. After-sales service	✓	✓	✓	✓
16. Phone Weight	✓	✓	✓	✓
17. Key agility	✓	✓	✓	✓
18. Warranty time period	✓	✓	✓	✓
19. With clear manual guide	✓	✓	✓	✓
20. With backlight screen	✓	✓	✓	✓
21. Large display screen	✓	✓	✓	✓
22. Support downloaded ringtones	✓	✓	✓	✓
23. Built-in games	✓	✓	✓	✓
24. With simple multi-function key	✓	✓	✓	✓

Table 4. Measurement item of customer satisfaction

Aspect	Items
Customer satisfaction	<ol style="list-style-type: none"> 1. I think this cell phone will meet my expectation. 2. Overall, I am satisfied with owning this cell phone. 3. Overall, I am satisfied with selecting this cell phone, and it is a right decision. 4. Overall, I am satisfied with the additional functions of the cell phone which I bought on line. 5. I am satisfied with the price of the cell phone which I bought on line. 6. I am satisfied with the quality of the cell phone which I bought on Internet. 7. I am satisfied with the overall functions of the cell phone which I bought on Internet.

The scale of customer satisfaction employed the research of Tzeng [55] to develop the measurement items. Synovate Report [5] pointed out that when selecting consumer electronics, Asia Pacific users more likely to consider on price (65%), quality (57%) and product functions (46%), which also applies to Taiwan consumers (price-65%, quality-57%, product functions-46%). Therefore, these factors were included in the scale. All the measurement items (see Table 4) have been developed with a concept of using Internet and aim at the cell phone industry. In addition, this study has employed the 6-point Likert scale to measure the degree of consumers' valuing the item ("1" represents "Completely Disagree" and "6" indicates "Completely Agree").

3.3 Questionnaire and Sampling Design

This research is to discuss eWOM; therefore, distribution of the e-questionnaires has its applicability. There are five parts in this questionnaire, which are "experiences in using cell phones and Internet", "e-Word of Mouth", "cell phone product attribute", "customer satisfaction" and "demographic variablesnk". The survey time was from April 25th 2010 to June 4th 2010, and totally 1,148 copies were retrieved. There are three questions designed for the purpose of threshold screening, which were "Did you ever buy any cell phones online?", "Is the cell phone you are using now purchased online?", "Did you ever gather information on Internet because of buying a cell phone?" Among the

retrieved 1,148 copies, 950 copies did not meet the threshold criteria. Therefore, the valid questionnaires were merely 198 copies, and the effective response rate was 17.2%.

3.4 Object and Scope

A research by Synovate Report [5] indicated that top three of the most looked-up products of Taiwan consumers were cell phones (53%), digital cameras (48%) and laptops (47%). Based on this result, this study aims at the leading product, cell phones, to explore consumer buying behaviors and to explore how eWOMs influence consumers' behaviors. The research objects were those who ever googled or spreaded the information about cell phone industry and those who ever purchased cell phones online. The research scope is "Cell phone websites", "Cell phone forums" and "Message boards of Buying Cell Phones online in Bulletin Boards System".

4. ANALYSIS AND RESULTS

4.1 Sample Distribution

Table 5 shows male is the predominant gender, which is 53%. We suggest it is because males are more interested in electronic goods and would, thus, search and purchase more often than females. As a result, more males were engaged in answering the questionnaires. Concerning the age, the largest group was between the ages of 21 to 30, which is 89%. This research deemed this age group prefers novel and showy high-tech gadgets. This group is also considered as the dominant buyers for shopping online, which represents the following research of this study is representable. Regarding marriage status, single is the largest group, which is 93%. About the occupation, most respondents are students, which is 58%. About the education degree, most of the respondents are with college degree or in college, which is 49%. The second largest group is graduate schools or above, which is 48%. Most of the respondents' average monthly income is under TWD\$20,000 (approximately USD\$666), which is 62%.

4.2 Reliability and Validity

4.2.1 Reliability

This research employed the Cronbach's α coefficient to measure the consistency among items of each aspect. Cronbach [56] deemed that α coefficient less than 0.35 would be considered as low reliability. If the alpha is between 0.35 and

0.7, it has medium reliability. When the value is greater than 0.7, it would be deemed as high reliability. In the measurement aspect, only the product interface (0.639) and fundamental elements (0.599) were slightly low, but the rest were all above 0.7 (as demonstrated in Table 6), which indicates that the scale of this research is with good reliability.

4.2.2 Validity

4.2.2.1 Content validity

All of the measurement items of each aspect are from previous studies (see Table 2 and Table 3); therefore, the scales of this study are with content validity.

4.2.2.2 Convergent validity

Convergent validity is about examining consistency between observable variables and latent variables. Raine-Eudy [57] argued only if factor loadings greater than 0.5, it can be included in the factor, which has been employed by this research as the screening criterion. Moreover, the average variance extracted (AVE) is to calculate the average variance explanatory power of observable variables for the latent variable. Higher the AVE of the latent variables means higher the convergent validity of the latent variables has. Fornell and Larcker [58] suggested that the value must be greater than 0.5, and the test of significance of path coefficient must reach a significance level. Generally, the t value is the criterion for judgment. Providing its absolute value is greater than 1.96, the parameter estimation would reach a significance level of 0.05. If it is greater than 2.58, then it comes to a significance level of 0.01. If the value is greater than 3.29, it would have reached the significance level of 0.001.

In respect of eWOM, Table 7 demonstrates the standardized factor loadings of each variable is greater than 0.5. The AVE and composite reliability (CR) of gathering positive eWOM are 0.636 and 0.913 respectively, and the t values are greater than 3.29. The AVE and CR of gathering negative eWOM are 0.680 and 0.862 respectively, and all the t values are over 3.29. The AVE and CR of spreading positive eWOM are 0.675 and 0.926 respectively, and all their t values are over 3.29. The AVE and CR of spreading negative eWOM are 0.688 and 0.898, and all the t values have exceeded 3.29. In conclusion, all the AVEs and CRs have achieved what the criteria require, which indicates that the scale of eWOM has convergent validity.

Table 5. Sample distribution

Item		Samples	%
Gender	Male	105	53%
	Female	93	47%
Age	20 or under	5	2%
	21 - 30	177	89%
	31 - 40	13	7%
	41 - 50	3	2%
	51 - 60	0	0%
	61 or above	0	0%
Marriage status	Married	14	7%
	Single	184	93%
Occupation	Military, government and school personnel	16	8%
	Agriculture and fisheries	1	1%
	Manufacturing	7	3%
	Service industry	22	11%
	Financial and commercial	12	6%
	Electronics industry	10	5%
	Student	115	58%
	Homemaker	0	0%
	Freelance	3	2%
	Miscellaneous	12	6%
Education	Junior high and under	1	1%
	Senior high school	5	2%
	College	97	49%
	Graduate school and above	95	48%
Personal average monthly income (TWD)	20,000 or under	123	62%
	20,001 - 35,000	44	22%
	35,001 - 50,000	22	11%
	50,001 - 65,000	4	2%
	65,001 - 80,000	2	1%
	80,001 or above	3	2%

Table 6. Cronbach's α value of each aspect

	Aspect	Cronbach's α
eWOM	Gathering positive WOM	0.911
	Gathering negative WOM	0.853
	Spreading positive WOM	0.924
	Spreading negative WOM	0.897
Product attributes	Product service	0.844
	Easy to use	0.787
	Additional functions	0.818
	Product interface	0.639
	Vogue appearance	0.832
Customer satisfaction	Fundamental elements	0.599
	Pre-purchase customer satisfaction	0.942
	Post-purchase customer satisfaction	0.951

Regarding product attributes, Table 8 shows that all the standardized factor loadings have exceeded 0.5. The AVE and CR of product service are 0.524 and 0.846 respectively, and the t values all are greater than 3.29. The AVE and CR of easy to use are 0.664 and 0.797, and the t values are both over 3.29. The AVE and CR of additional function are 0.696 and 0.821, and the t

values are both over 3.29. The AVE and CR of product interface are 0.494 and 0.658 respectively, and the t values are both greater than 3.29. The AVE and CR of vogue appearance are 0.733 and 0.845, and the t values have exceeded 3.29. The AVE and CR of fundamental elements are 0.429 and 0.6, and the t values are both greater than 3.29. To conclude,

only the AVE of product interface and the AVE and CR of fundamental elements are close to the reference values, but others have reached the criteria, which represents the scale of product attributes has convergent validity.

About customer satisfaction, Table 9 shows that all the standardized factor loadings are greater than 0.5. The AVE and CR of pre-purchase customer satisfaction (about product evaluation) are 0.705 and 0.944 respectively, and all the *t* values are greater than 3.29. The AVE and CR of post-purchase customer satisfaction are 0.741 and 0.953, and all *t* values have exceeded 3.29.

In conclusion, all the AVEs and CRs have met the criteria, which represents that the scale of customer satisfaction has convergent validity.

4.3 Structural Equation Modeling, SEM

4.3.1 Framework before purchasing

First, the goodness of fit of framework was examined, and the results are as shown in the Table 10. According to Table 10, χ^2/df and GFI have reached the reference values, and others are close to the reference values, which means the goodness of fit of this model is acceptable.

Table 7. Convergent validity of eWOM

Aspect	Item	Standardization factor loading	<i>t</i> value	CR	AVE	SMC (R ²)
Gathering positive eWOM	Variable 1	0.769	12.452	0.913	0.636	0.591
	Variable 2	0.843	14.328			0.711
	Variable 3	0.728	11.547			0.530
	Variable 4	0.835	14.134			0.697
	Variable 5	0.782	12.753			0.612
	Variable 6	0.821	13.750			0.675
Gathering negative eWOM	Variable 1	0.951	16.303	0.862	0.680	0.905
	Variable 2	0.834	13.627			0.695
	Variable 3	0.664	10.177			0.441
Spreading positive eWOM	Variable 1	0.832	14.122	0.926	0.675	0.693
	Variable 2	0.789	13.095			0.622
	Variable 3	0.906	16.239			0.821
	Variable 4	0.786	13.004			0.617
	Variable 5	0.828	13.991			0.685
	Variable 6	0.782	12.799			0.611
Spreading negative eWOM	Variable 1	0.772	12.389	0.898	0.688	0.595
	Variable 2	0.814	13.434			0.662
	Variable 3	0.904	16.060			0.817
	Variable 4	0.822	13.581			0.676

Table 8. Convergent validity of product attribute

Aspect	Item	Standardization factor loading	<i>t</i> value	CR	AVE	SMC (R ²)
Product service	Variable 1	0.788	12.568	0.846	0.524	0.621
	Variable 2	0.680	10.251			0.462
	Variable 3	0.706	10.777			0.498
	Variable 4	0.729	11.260			0.531
	Variable 5	0.711	10.881			0.505
Easy to use	Variable 1	0.897	11.392	0.797	0.664	0.805
	Variable 2	0.724	9.503			0.525
Additional function	Variable 1	0.869	11.335	0.821	0.696	0.755
	Variable 2	0.798	10.520			0.636
Product interface	Variable 1	0.784	10.696	0.658	0.494	0.614
	Variable 2	0.611	8.422			0.373
Vogue appearance	Variable 1	0.947	12.500	0.845	0.733	0.897
Fundamental elements	Variable 2	0.755	10.186	0.6	0.429	0.570
	Variable 1	0.632	8.145			0.399
	Variable 2	0.677	8.630			0.459

Table 9. Convergent validity of customer satisfaction

Aspect	Item	Standardization factor loading	t value	CR	AVE	SMC (R ²)
Pre-purchase customer satisfaction	Variable 1	0.870	15.260	0.944	0.705	0.756
	Variable 2	0.857	14.907			0.735
	Variable 3	0.870	15.263			0.757
	Variable 4	0.819	13.868			0.670
	Variable 5	0.751	12.215			0.564
	Variable 6	0.864	15.099			0.747
	Variable 7	0.843	14.524			0.711
Post-purchase customer satisfaction	Variable 1	0.870	15.328	0.953	0.741	0.758
	Variable 2	0.908	16.463			0.825
	Variable 3	0.871	15.331			0.758
	Variable 4	0.847	14.661			0.717
	Variable 5	0.786	13.080			0.617
	Variable 6	0.871	15.351			0.769
	Variable 7	0.870	15.321			0.757

Table 10. Goodness of fit of framework before purchasing

Index of goodness of fit	Reference value	Reference	Results
Absolute fit index			
χ^2/df	< 5	Marsh & Hocevar [59]	2.620
GFI	0.80 - 0.89 reasonable fit > 0.90 excellent fit	Joreskog & Sorbom [60]	0.813
AGFI	> 0.80 good fit	Bagozzi & Yi [61]	0.768
RMSEA	=< 0.05 very good fit 0.05 - 0.08 right fit 0.08 - 0.10 mediocre fit > 0.10 poor fit	Huang [62]	0.091
Incremental Fit Index			
NFI	> 0.90	Huang [62]	0.824
CFI			0.882
NNFI			0.866

The path analysis was then employed to examine the influence relation among the variables. Table 11 demonstrates that product attribute gives positive significant effect on gathering positive eWOM; therefore, H1a is sustained. Further, it also gives positive significant effect on gathering negative eWOM, which indicates H1b is also sustained. Therefore, H1 is sustained, which means that when consumers attach greater importance to cell phones' product attributes, they are more likely to gather eWOM online. Gathering positive eWOM has positive significant effect on pre-purchase customer satisfaction; therefore, H2a is sustained. However, gathering negative eWOM has no significance effect on pre-purchase customer satisfaction; therefore, H2b is not sustained. As a result, H2 is only partially sustained, which indicates if consumers gather more positive WOM before their purchasing, it is more likely to increase their pre-purchase customer satisfaction. But product attribute has no significant effect on pre-purchase customer

satisfaction; therefore, H3 is not sustained, which means no significant correlation was found between product attributes and pre-purchase customer satisfaction.

At the end, mediation effect was examined. Baron and Kenny [63] suggested that if three regression equations satisfy the three conditions listed below, then it is considered having mediation effect.

1. In the model, the independent variables (product attributes) give significant effects on mediators (gathering eWOM).
2. In the model, the independent variables (product attributes) and the mediators (gathering eWOM) both have significant effects on dependent variables (pre-purchasing customer satisfaction).
3. After examining mediators (gathering eWOM) and independent variables simultaneously for the dependent variables (pre-purchase customer satisfaction), if the

initial significant correlation between independent variables and dependent variables becomes not much significant due to the existence of mediators, but mediators are still having significant relation with independent variables, the mediation effect is supported.

Baron and Kenny [5] also pointed out that if the independent variables' effect on the dependent variables has turned from significant to insignificant due to the input of a mediator, it is said to have complete mediation. While the effect reduced, but still remains significant, it is considered to have partial mediation.

This research has examined the correlation between product attributes and gathering eWOM, between product attributes and pre-purchase customer satisfaction, between gathering eWOM and pre-purchase customer satisfaction. The results are demonstrated in Table 12. Product attribute is significantly correlated with gathering eWOM. Product attribute has significant correlation with pre-purchase customer satisfaction. Gathering eWOM is also significantly correlated with pre-purchase customer satisfaction. More examinations then were done in order to check how the product attribute and gathering eWOM work on pre-purchase customer satisfaction. The result

showed there is no significant correlation between product attribute and pre-purchase customer satisfaction. Moreover, it was found that the standardized coefficient of product attribute for pre-purchase customer satisfaction is 0.036, which was very close to 0, and it means product attribute would not exert effects on pre-purchase customer satisfaction. To summarize, product attribute would give effects on pre-purchase customer satisfaction through gathering eWOM; therefore, gathering eWOM exerts complete mediation effect.

4.3.2 Post-purchase framework

First, the goodness of fit of framework was examined, which is shown in the Table 13. Table 13 demonstrates χ^2/df , GFI and CFI have reached the reference values, and others are close to the reference values, which represents this model's goodness of fit of framework is acceptable.

The path analysis was then conducted to examine the effect relationships among the variables. According to Table 14, product attribute gives positive significant effect on spreading positive eWOM; therefore, H4a is supported. And it also gives positive significant effect on spreading negative eWOM; therefore, H4b is sustained. To conclude, H4 is

Table 11. Path analysis of framework before purchasing

Path analysis	Standardized coefficient	S.E	C.R	p
Product attributes → Gathering positive eWOM	0.472	0.109	5.356	***
Product attributes → Gathering negative eWOM	0.296	0.124	3.537	***
Gathering positive eWOM → Pre-purchase customer satisfaction	0.494	0.078	5.738	***
Gathering negative eWOM → Pre-purchase customer satisfaction	-0.004	0.054	-0.058	0.954
Product attributes → Pre-purchase customer satisfaction	0.069	0.100	0.774	0.439

Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Table 12. Mediation effect of framework before purchasing

Path analysis	Standardized coefficient	S.E	C.R	p
Product attributes → Gathering eWOM	0.497	0.100	5.246	***
Product attributes → Pre-purchase customer satisfaction	0.274	0.083	3.333	***
Gathering eWOM → Pre-purchase customer satisfaction	0.525	0.114	4.012	***
Product attributes, Gathering eWOM → Pre-purchase customer satisfaction	0.036	0.101	0.370	0.711

Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Table 13. Goodness of fit of framework after purchasing

Index of goodness of fit	Reference value	Reference	Results
Absolute Fit Index			
χ^2/df	< 5	[59]	2.327
GFI	0.80 - 0.89 reasonable fit > 0.90 excellent fit	[60]	0.804
AGFI	> 0.80 good fit	[61]	0.760
RMSEA	=< 0.05 good fit 0.05 - 0.08 right fit 0.08 - 0.10 mediocre fit > 0.10 poor fit	[62]	0.082
Incremental fit index			
NFI	> 0.90	[62]	0.847
CFI			0.906
NNFI			0.894

Table 14. Path analysis of framework after purchasing

Path analysis	Standardized coefficient	S.E	C.R	p
Product attributes → Spreading positive eWOM	0.328	0.167	3.853	***
Product attributes → Spreading negative eWOM	0.288	0.171	3.131	**
Post-purchase customer satisfaction → Spreading positive eWOM	0.257	0.125	3.401	***
Post-purchase customer satisfaction → Spreading negative eWOM	-0.176	0.128	-2.149	*
Product attributes → Post-purchase customer satisfaction	0.346	0.098	4.171	***

Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Table 15. Mediating effect of pre-purchase framework

Path analysis	Standardized coefficient	S.E	C.R	p
Product Attribute → Post-purchase customer satisfaction	0.344	0.101	4.184	***
Product Attribute → Spreading eWOM	0.390	0.145	4.760	***
Post-purchase customer satisfaction → Spreading eWOM	0.695	0.109	5.314	***
Product Attribute, Post-purchase customer satisfaction → Spreading eWOM	0.364	0.238	3.320	***

Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

supported, which implies that when consumers attach more importance to cell phones' product attributes, they are more likely to spread eWOM online. Post-purchase customer satisfaction has positive significant effect on the behavior of spreading positive eWOM; therefore, H5a is supported. Moreover, post-purchase customer satisfaction gives negative significance effect on spreading negative eWOM; therefore, H5b is also supported. To conclude, H5 is varified, indicating higher the customer satisfaction, consumers are more likely to spread positive eWOM, but less likely to spread negative eWOM. H6 is supported by the finding that the product attribute has positive significant effect on post-

purchase customer satisfaction. This result revealed that if consumers value the product attributes of cell phones more, it would be more likely to influence their post-purchase customer satisfaction.

A test on a mediation test was performed in the last step. This research conducted examinations to examine the relationships between product attribute and post-purchase customer satisfaction, and between product attribute and spreading eWOM as well as between post-purchase customer satisfaction and spreading eWOM. Table 15 shows there was a significant correlation between product attribute and post-

purchase customer satisfaction. We also found a significant correlation between product attributes and spreading eWOM, and a significant correlation was observed between post-purchase customer satisfaction and spreading eWOM. Further, more examinations were carried out to test the relationships of product attribute, post-purchase customer satisfaction and spreading eWOM. The test showed a significant correlation between product attribute and spreading eWOM, whose standardized coefficient was lower than the one of product attributes on spreading eWOM; therefore, we believed post-purchase customer satisfaction has partial mediation effect.

5. CONCLUSION AND SUGGESTION

5.1 Conclusion

For product attributes and customer satisfaction, the pre-purchase framework shows product attribute did not significantly influence pre-purchase customer satisfaction. But the post-purchase framework indicates that product attribute has significantly positively influenced post-purchase customer satisfaction. The most likely causes of this result is that consumers would be able to perceive product attributes, such as appearance, screen, function, only after having actual engagement with the product. Therefore, before making a purchase, there are no possibilities for consumers to gain actual experiences from the product attributes and, thus, it would not influence their expected satisfaction. In other words, the product attributes will influence consumers' satisfaction only if consumers have experienced the product.

For product attributes and eWOM, product attributes are having positive significant correlation with eWOM both in gathering positive eWOM and gathering negative eWOM in the pre-purchase framework and also in spreading positive eWOM and spreading negative eWOM in the post-purchase framework. This result revealed that if consumers weight a cell phone's product attributes more, they are more likely to gather this phone's positive and negative eWOM in order to learn more about this phone and to reduce their purchase risk. Furthermore, it also shows that if consumers value product attributes more, they are more likely to spread this cell phone's positive and negative eWOM in order to share their real experience and perception.

For eWOM and customer satisfaction, gathering positive eWOM has positive significant correlation with pre-purchase customer

satisfaction in the pre-purchase framework, but gathering negative eWOM does not significantly influence pre-purchase customer satisfaction. The cause may be that before making a purchase, consumers tend to gather only positive eWOMs to increase their satisfaction in order to prove their purchase of that phone is worthwhile and to support their decision being right. In addition, the post-purchase framework shows that post-purchase customer satisfaction is positively significantly correlated with spreading positive eWOM, and is negatively significantly correlated with spreading negative eWOM. This result reveals that if the consumers have higher customer satisfaction, they are more likely to spread positive eWOM, but less likely to spread negative eWOM.

Concerning product attributes, eWOM and customer satisfaction, the pre-purchase framework demonstrates that product attributes has no significant influence on pre-purchase customer satisfaction, and only could generate influences via gathering eWOM, which has full mediation effect; accordingly, before making a purchase, gathering eWOM deeply influences consumer buying decision. Further, the post-purchase framework reveals that product attributes not only have positive significant correlation with spreading eWOM, but could influence spreading eWOM via post-purchase customer satisfaction, which is with partial mediation effect. Therefore, the product attributes and the degree of customer satisfaction considerably influence on the activities of consumers' spreading eWOM.

5.2 Suggestion

Product attributes have positive significant influence on both pre-purchase gathering eWOM and post-purchase spreading eWOM, indicating product attributes influence profoundly on eWOM. On this basis, this study suggests cell phone manufacturers could do online and street-intercept surveys to learn more about consumer needs. And manufacturers could develop cell phones based on the diverse needs of different groups, for example, the seniors would need a phone with loud ring tones, large screen and keys, and positioning system etc, but for business use, the phones should be able to connect to Internet, receiving emails and able to conduct video conferences.

For eWOM and customer satisfaction, this research showed that positive eWOMs would affect consumers' satisfaction before consumers'

making a purchase. Accordingly, it is suggested that cell phone manufacturers should keep their eyes on every negative reviews and eWOM online. Once negative words turning up, they should be deeply investigated, and the complaints should be addressed in order to control the negative image to be proliferated. This study also suggested that cell phone manufactures could offer new phone replacement warranty, provide full and complete product information and thorough after-sale service, such as extended warranty, free home pick-up service, giving replacement phones while fixing, in order to increase customer satisfaction and to make customers be willing to spread more and better positive eWOM, as Engel et al. [64] said, "your best salesman is a satisfied customer"

5.3 Contribution

There are many researches on eWOM, but, little has worked on how cell phone product attributes influence consumers' behaviors on eWOM. The empirical results of this study showed that cell phones' product attributes indeed would positively, significantly influence consumers' pre- and post-purchase eWOM behaviors. Besides, this research has developed pre- and post-purchase behavior models in order to learn the differences and to know more on the consumer behaviors. On these grounds, this study does have its academic value. We have obtained empirical results demonstrating that gathering positive eWOM do influence the pre-purchase customer satisfaction, the product attributes would affect the pre-purchase customer satisfaction only via gathering eWOM, and the post-purchase customer satisfaction would positively and significantly have influences on spreading eWOM. These grounds all indicate eWOM definitely has crucial and profound influences on consumer purchase decisions. With this ground, this study is of real worth for empirical reference.

5.4 Limitation and Future Work

The most important limitation lies in the fact that the survey takers in this research were only qualified if their in-use cell phones had been purchased online. Therefore, we recommend that the following researches could add samples of the cell phones which were purchased online and compare their differences. Moreover, this study also suggests the future researches could add more aspects, such as loyalty, to give a further exploration.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. FIND; 2011a. Available:<http://www.find.org.tw/find/home.aspx?page=many&id=295> (Assessed 17 December 2011)
2. FIND; 2011b. Available:<http://www.find.org.tw/find/home.aspx?page=many&id=300> (Assessed 17 December 2011)
3. Goldsmith RE, Horowitz D. Measuring motivations for online opinion seeking. *Journal of Interactive Advertising*. 2006;6(2):1-16.
4. Mittal V, Ross WT Jr, Baldasare PM. The asymmetric impact of negative and positive attribute-level performance on overall satisfaction and repurchase intentions. *Journal of Marketing*. 1998;62:33-47.
5. Synovate Report. No more geek - Internet becomes the main information provider of consumer electronics; 2008. Available:http://advertising.microsoft.com/taiwan/research?Adv_ResearchReportID=753 (Accessed 7 October 2009)
6. Doh SJ, Hwang JS. How consumers evaluate eWOM (electronic word-of-mouth) messages. *Cyber Psychology & Behavior*. 2009;12(2):193-197.
7. Hanson WA. Principles of internet marketing. Ohio: South-West College Publishing; 2000.
8. TARP. Measuring the grapevine-consumer response and word-of-mouth. Office of Consumer Affairs; 1989.
9. Chen CY, Chang SH, Hsiao YL. The effects of value-added service on customer satisfaction and electronic word-of-mouth of online group buying: The moderating effect of consumers' perceived justice. *Electronic Commerce Studies*. 2014;12(2): 169-200.
10. Lim WM. The influence of internet advertising and electronic word of mouth on consumer perceptions and intention: Some evidence from online group buying. *Journal of Computer Information Systems*. 2015;55(4):81-89.
11. Chen J, Teng L, Yu Y, Yu X. The effect of online information sources on purchase intentions between consumers with high

- and low susceptibility to informational influence. *Journal of Business Research*. 2016;69:467-475.
12. Baber A, Thurasamy R, Malik MI, Sadiq B, Islam S, Sajjad M. Online word-of-mouth antecedents, attitude and intention-to-purchase electronic products in Pakistan. *Telematics and Informatics*. 2016;33:388-400.
 13. Wang MJ, Lin CY, Chen YC, Lin C. The antecedents of electronic word-of-mouth: An empirical study on the famous website in Taiwan. *Journal of Customer Satisfaction*. 2016;12(1):65-92.
 14. Hussain S, Ahmed W, Jafar RMS, Rabnawaz A, Jianzhou Y. eWOM source credibility, perceived risk and food product customer's information adoption. *Computers in Human Behavior*. 2017;66: 96-102.
 15. Gelb BD, Sundaram S. Adapting to word of mouse. *Business Horizons*. 2002;45(4):21-25.
 16. Hennig-Thurau T, Walsh G. Electronic word-of-mouth: Motives for and consequences of reading customer articulations on the internet. *International Journal of Electronic Commerce*. 2003;8(2): 51-74.
 17. Westbrook RA. Product/consumption-based affective responses and postpurchase processes. *Journal of Marketing Research*. 1987;24(3):258-270.
 18. Hoffman DL, Novak TP. Marketing in hypermedia computer-mediated environments: Conceptual foundations. *Journal of Marketing*. 1996;60(3):50-68.
 19. Litvin SW, Goldsmith RE, Pan B. Electronic word-of-mouth in hospitality and tourism management. *Tourism Management*. 2008;29(3):458-468.
 20. Tanimoto J, Fujii H. A study on diffusional characteristics of information on a human network analyzed by a multi-agent simulator. *The Social Science Journal*. 2003;40(3):479-485.
 21. Jian PY. The study of attribute with product familiarity. Unpublished Master Thesis, Tamkang University, Taiwan; 2001.
 22. Wu ZY. The linkage of product attribute and design parameter - Take cellular phone as an example. Unpublished master thesis, National Taipei University, Taiwan; 2001.
 23. Chiou WH. Marketing management - market analysis and strategy planning, 1st Edition. Taipei: Best-Wise Publishing; 1999.
 24. Park CW, Jaworski BJ, MacInnis DJ. Strategic brand concept-image management. *Journal of Marketing*. 1986;50:135-145.
 25. Strahilevitz M, Myers JG. Donations to charity as purchase incentives: How well they work may depend on what you are trying to sell. *Journal of Consumer Research*. 1998;24(4):434-446.
 26. Hirschman EC, Holbrook MB. Hedonic consumption: Emerging concepts, methods and propositions. *Journal of Marketing*. 1982;46:92-101.
 27. Lo WK. Marketing communication, 1st Edition. Taipei: San Min Book; 1986.
 28. Lefkoff-Hagius R, Mason CH. Characteristic, beneficial, and image attributes in consumer judgments of similarity and preference. *Journal of Consumer Research*. 1993;20(1):100-110.
 29. Fei T. Theory examination and extension of online market maven - A research on their online information gathering, WOM spreading, online shopping behaviors and personal traits. Unpublished master thesis, National Cheng Chi University, Taiwan; 2000.
 30. Chen SY. How source credibility of word-of-mouth in Internet forum influence message's trust. Unpublished master thesis, National Taiwan University of Science and Technology, Taiwan; 2004.
 31. Wang JC. Effects of online negative word-of-mouth on receiver's attitude toward product in different brand awareness. Unpublished master thesis, National Chiao Tung University, Taiwan; 2006.
 32. Wang ZZ. Influence on expertise and tie strength on purchase decision in word-of-mouth of Internet: An e-mail analysis. Unpublished master thesis, National Taiwan University of Science and Technology, Taiwan; 2004.
 33. Aaker DA. Building strong brands. New York: The Free Press; 1996.
 34. Young S, Feigin B. Using the benefit chain for improved strategy formulation. *Journal of Marketing*. 1975;39(3):72-74.
 35. Cardozo RN. An experimental study of consumer effort, expectation and satisfaction. *Journal of Marketing Research*, 1965;21:244-249.
 36. Hunt HK. Conceptualization and measurement of consumer satisfaction

- and dissatisfaction. Cambridge, MA: Marketing Science Institute; 1977.
37. Hempel DJ. Consumer satisfaction with the home buying process: Conceptualization and measurement. In H. K. Kieth (Ed.), *The conceptualization of consumer satisfaction and dissatisfaction*. Cambridge, Mass: Marketing Science Institute; 1977.
 38. Oliver RL. A cognitive model of the antecedents and consequences of satisfaction decisions. *Journal of Marketing Research*. 1980;17(4):460-469.
 39. Churchill GA, Surprenant C. An investigation into the determinant of customer satisfaction. *Journal of Marketing Research*. 1982;19:491-504.
 40. Tse DK, Wilton PC. Models of consumer satisfaction formation: An extension. *Journal of Marketing Research*. 1988;25: 204-212.
 41. Westbrook RA, Oliver RL. The dimensionality of consumption emotion patterns and consumer satisfaction. *Journal of Consumer Research*. 1991;18(1):84-91.
 42. Ganesh J, Arnold MJ, Reynolds KE. Understanding the customer base of service providers: An examination of the differences between switchers and stayers. *Journal of Marketing*. 2000;64(3):65-87.
 43. Chiou J, Droge C, Hanvanich S. Does customer knowledge affect how loyalty is formed? *Journal of Service Research*. 2002;5(2):113-124.
 44. Kotler P, Armstrong G. *Marketing: An introduction*, 6th Edition. Prentice Hall; 2006.
 45. Yang XC, Zhang XH, Wu J, Xu J. Impact of marketing efforts and customer satisfaction on word-of-mouth-study based on mobile phone user in China. *Journal of Chinese Marketing*. 2008;1(1):41-46.
 46. Chen YR. Discussion on product attributes and lifestyle influencing consumers' decision making on purchasing behavior - sleepy product as an example. Unpublished master thesis, Da Yeh University, Taiwan; 2005.
 47. Podoshen JS. The African American consumer revisited: Brand loyalty, word-of-mouth and the effects of the black experience. *Journal of Consumer Marketing*. 2008;25(4):211-222.
 48. Crosby LA, Evans KR, Cowles D. Relationship quality in service selling: An interpersonal influence perspective. *Journal of Marketing*. 1990;54(3):68-81.
 49. Hennig-Thurau T, Gwinner KP, Walsh G, Gremler DD. Electronic word-of-mouth via consumer-opinion platforms: What motivates consumers to articulate themselves on the internet. *Journal of Interactive Marketing*. 2004;18(1):38-52.
 50. Bansal HS, Voyer PA. Word-of-mouth processes within a services purchase decision context. *Journal of Service Research*. 2000;3(2):166-177.
 51. Zeithaml VA, Berry LL, Parasuraman A. The behavioral consequences of services quality. *Journal of Marketing*. 1996;60(2): 31-46.
 52. Gremler DD, Gwinner KP. Customer-employee rapport in service relationships. *Journal of Service Research*. 2000;3(1):82-104.
 53. Wei SL. Study on the purchasing behavior of the customers and market segmentation of the mobile telephone service - A case study for the residents in northern Taiwan. Unpublished master thesis, National Chiao Tung University, Taiwan; 2000.
 54. Liu DA. The research on market segmentation on digital mobiles - Students from great Taipei region as an example. Unpublished Master Thesis, Taiwan Soochow University, Taiwan; 2000.
 55. Tzeng WC. Formation and influence of eWOM - Cell Phone as the example. Unpublished master thesis, Fo Guang University, Taiwan; 2006.
 56. Cronbach LJ. Coefficient alpha and the internal structure of tests. *Psychometrika*. 1951;16(3):297-334.
 57. Raine-Eudy R. Using structural equation modeling to test for differential reliability and validity: An empirical demonstration. *Structural Equation Modeling*. 2000;7(1): 124-141.
 58. Fornell C, Larcker DF. Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*. 1981;18:39-50.
 59. Marsh H, Hocevar D. Application of confirmatory factor analysis to the study of self-concept: First- and higher-order factor models and their invariance across groups. *Psychological Bulletin*. 1985;97(3):562-582.
 60. Joreskog KG, Sorbom D. *LISREL 7: A guide to the program and application*. Chicago, IL: SPSS Inc; 1988.

61. Bagozzi RP, Yi Y. On the evaluation of structural equation models. *Academy of Marketing Science*. 1988;16(1):17-94.
62. Huang FM. *Theories and application of structural equation model*, 5th Edition. Taipei: Wu-Nan Book; 2007.
63. Baron RM, Kenny DA. The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality & Social Psychology*. 1986;31(6):1173-1182.
64. Engel JF, Kegerreis RJ, Blackwell RD. Word of mouth communication by the innovator. *Journal of Marketing*. 1969;33(3): 15-19.

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