Electronic service quality of Facebook social commerce and collaborative learning

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ABSTRACT

The burgeoning growth of Web 2.0 and social media (i.e., social commerce) has changed the purchase behavior of consumers and businesses' marketing strategies. However, there are no electronic service quality (e-SQ) criteria for this new phenomenon in the Internet environment. This article aims to utilize the dimensions of e-SQ to measure the service quality of commercial activities on social media (e.g., Facebook (FB)). It also applies an analytic hierarchy process (AHP) questionnaire of 50 students who have experience of using FB ads linkage and then utilizes the fuzzy analytic hierarchy process (FAHP) to analyze the weighting of the e-SQ evaluation. Moreover, this study shows the effectiveness of collaborative learning in exploring e-SQ on social networks among participating students from different countries. Additionally, the VlseKriterijumska Optimizacija I Kompromisno Resenje (VIKOR) method is used to find the optimum dimensions of e-SQ and ideal commercial activities on FB. These findings demonstrate not only the dimensions of e-SQ that Facebook users prefer and which brands are 'liked' by them, but also highlight the opportunity for developing new e-SQ criteria of social commerce.

1. Introduction

The rise of the Internet has changed consumers' decision-making behavior, and information sharing from social media has become an important reference for consumers making purchasing decisions (Court, Elzinga, Mulder, & Vetvik, 2009). Social media (e.g., Facebook (FB), Twitter, Plurk, YouTube) and other types of internet communities in recent years have become mainstream over the world, and increasing numbers of individuals or businesses have become involved in social media activities (Edelman, 2010). Especially regarding the for-profit element, social media plays a more important role in business branding and marketing strategy than do television, newspapers and magazines. It can reinforce business relationships with consumers, increase flow to company websites, and look for new business opportunities (Michaelidou, Siamagka, & Christodoulides, 2011). It also makes businesses provide high quality products, forecast market trends, and maximizes the effectiveness of their ads on social media (Constantinides, Romero, & Boria, 2008). In addition, it shows how the development of social media and the creation of the

Web 2.0 platform have transformed e-commerce into a consumer-oriented environment (Huang & Benyoucef, 2013). For consumers, Web 2.0 has affected aspects of consumers' control and value creation. Consumers' ideas, preferences, and decisions are presented on social media via content generated by them (Constantinides & Fountain, 2008). With further development of social media and Web 2.0, electronic word of mouth (eWOM) marketing also has changed the roles of both companies and consumers in a new social media setting (Zhang, Craciun, & Shin, 2010). This new internet concept is commonly referred to as social commerce (Huang & Benyoucef, 2013).

Academic research on social commerce involves discussion of topics such as how eWOM affects behaviors of consumers (Zhang et al., 2010), the effects of online review quality (Lee & Shin, 2014), the intentions of FB users (Dong, Cheng, & Wu, 2014; Ku, Chen, & Zhang, 2013), advertising on social media (Saxena & Khanna, 2013), personality traits on FB usages (Kuo & Tang, 2014), brand evaluation in social media (Naylor, Lamberton, & West, 2012), and the role Web 2.0 plays in the relationship between businesses and consumers (Michaelidou et al., 2011). However, there are few studies to define the ways to measure the service quality of commercial activities on social media. The currently used electronic service quality (E-S-QUAL) metrics do not always cover features of consumers on social media. Regarding these issues, in

the present study we investigates and count the items of E-S-QUAL from the relevant literature, then utilize an Analytic Hierarch Process (AHP) questionnaire to ask 50 students who have relevant experiences of commercial activities in FB links (e.g., like, share and comment pages, online coupons and advertisement links). We also use the Fuzzy Analytic Hierarch Process (FAHP) to analyze the weighting of evaluation criteria. Furthermore, we measure cases of commercial activities of the best global brands 2013 from Inter-brand and employ the VlseKriterijumska Optimizacija I Kompromisno Resenje (VIKOR) method to determine which kind of brands and commercial activities in FB will be 'liked' by FB users. These findings also highlight the opportunity for developing new e-SQ criteria for this new Internet phenomenon and discuss the effectiveness of collaborative learning among participating students.

2. Literature review

2.1. Social commerce

E-commerce is facing an evolution, which involves the use of Web 2.0 to enhance the participation of users of social media, and this will be of great economic worth. This new Internet phenomenon is commonly referred to as social commerce (Huang & Benyoucef, 2013). The concept of Web 2.0 is that of a platform for harnessing collective intelligence (Kaplan & Haenlein, 2010). However, the term 'Web 2.0' does not represent a new fundamental technological virtual platform; instead, it can be described as an attitude, which leads to the evolution of web-based communities (Graham & Smart, 2010). Within this new Internet setting, consumers employ social knowledge and experiences to support them in filtering their choices and in making more informed and accurate purchase decisions (Court et al., 2009). At the same time, online businesses are able to capture consumers' intentions, which provides them with knowledge of consumers' shopping experiences and preferences and so helps businesses to have more accurate marketing strategies (Constantinides & Fountain, 2008; Edelman, 2010). Social commerce can also be defined as word-of-mouth applied to e-commerce (Dennison, Bourdage-Braun, & Chetuparambil, 2009), and it involves a more social, creative and collaborative approach than is used in online marketplaces (Parise & Guinan, 2008). The phenomena of eWOM show that online consumers have ability to share their experiences, opinions and knowledge with others on popular topics (Huang, Hsieh, & Wu, 2014; Prendergast, Ko, & Yuen, 2010), and eWOM appearing in social networking site (SNS) can deliver brand messages to millions of SNS users, and that will reap the potential to retain existing customers and attract new consumers (Chu & Kim, 2011). Further, eWOM can be an unique communication tool in popular microblogging site (Kim, Sung, & Kang, 2014).

In an integrated definition, social commerce is an online medium which combines Web 2.0 technologies and the psychology of social shopping within a virtual community (Kim & Srivastava, 2007; Marsden, 2009), and includes elements of marketing, computer science, sociology and psychology, which all add to the diversity of definitions (Constantinides et al., 2008). Social commerce is an Internet-based commercial application, leveraging social media and Web 2.0 technologies which support social interaction and user-generated content in order to assist consumers in their decision making and acquisition of products and services within online marketplaces and communities (Huang & Benyoucef, 2013).

As mentioned above, the evolution of the Internet environment has changed the style of human life, especially when it involves consumption decisions. In the past, besides televisions, journals, and some available product information, consumers, in order to filter out the final choice of several brands, most frequently used friends and relatives to gather opinions. However, there are some

clear advantages to consumption decisions being made through social media. The consumers can benefit from greatly reduced product information screening time and can quickly learn to use other people's strategies or experience sharing when purchasing products (Court et al., 2009). Previously, companies used to advertise in the traditional media (e.g., television, radio and different journals, magazines), but there are many reasons which could explain why companies should switch to social media. One reason is that consumers attracted via social media will demonstrate better brand loyalty. Another strong argument is that social media offers new ways to get consumers' attention, which is different from using online searches and displaying ads. Taking FB as an example, people have an average of 130 FB friends, so when they "like" a brand, that spreads instantly to the news feeds of many of those friends who then may spread it further to their friends, potentially building to millions of people in a second (Hof, 2011). By 2011, approximately 83% of Fortune 500 companies were using some form of social media to connect with consumers (Naylor et al., 2012).

2.2. Measures of electronic service quality

Generally, social commerce combines e-commerce with Web 2.0 to present a platform of social media (Constantinides et al., 2008). But how to measure the service quality of social commerce is an important issue. Before the age of social commerce, a new channel – the Internet – became a new marketplace; in addition, online service quality had a great impact on many aspects of e-commerce, which is why there is a tendency in researchers to focus on and intensify their research in this new field.

The historical development of the online service quality literature presents several theories and measurement scales. There are two ways to develop measures of electric service quality (e-SQ). The first is described by Zeithaml, Parasuraman, and Malhotra (2002). This measure attempted to assess e-SQ in terms of the design and quality of websites that included factors which led to consumer satisfaction with a website (Alpar, Porembski, & Pickerodt, 2001; Szymanski & Hise, 2000). Alpar et al. (2001) identified four attributes of satisfaction with a website: ease of use, information of content, entertainment, and interactivity. Liu and Arnett (2000) also pointed out the key factors of website success, that is, information and service quality, system use, playfulness and system design quality, while Szymanski and Hise (2000) suggested four dominant factors in consumers' e-satisfaction, namely convenience, merchandising, site design, and financial security. For the second measure, researchers tried to develop more direct and comprehensive measures of the construct of e-SQ. They modified or replicated the well-known 'SERVQUAL' scale (Parasuraman, Berry, & Zeithaml, 1991; Parasuraman, Zeithaml, & Berry, 1988) and created their own scale to measure the construct (e.g., Gefen, 2002; Ho & Lee, 2007; Loiacono, Watson, & Hoodhue, 2002; Parasuraman, Zeithaml, & Malhotra, 2005).

As seen in Table 1, we ranked numbers of social sciences citations from Web of Science and Google to understand which papers of e-SQ are most cited by researchers.

3. Methods

This paper aims to identify the e-SQ criteria of commercial activities on FB. First, we rank the dimensions and factors in accordance with the ranking of e-SQ citations (Table 2). Second, we apply the results of an AHP questionnaire distributed to 50 young people who have experience of using FB ads linkage and then utilize the FAHP to analyze the weighting of e-SQ evaluation. Moreover, we use the VIKOR method to find which commercial activities of

Table 1
Ranking of e-SQ papers citation.

Numbers Of citation	Author	Domain of Measures	Dimensions
347(997)	Parasuraman et al. (2005)	Electronic service quality	1. Efficiency 2. System availability 3. Fulfillment 4. Privacy
283(896)	Wolfinbarger and Gilly (2003)	E-tail quality	1. Website design 2. Fulfillment 3. Reliability 4. Security 5. Privacy 6. Customer service
169(606)	Ranganathan and Ganapathy (2002)	Important characteristics Web sites	1. Information content 2. Design 3. Security 4. Privacy
203(580)	Aladwani and Palvia (2002)	Web service quality	1. Technical adequacy 2. Specific content 3. Content quality 4. Web appearance
146(521)	Yoo and Donthu (2001)	Online retailers' Web site quality	1. Ease of use 2. Aesthetic design 3. processing speed 4. Security
(476)	Barnes and Vidgen (2002)	Web site quality	1. Usability 2. Design 3. Information 4. Trust 5. Empathy
(373)	Lee and Lin (2005)	Online service quality	1. Web site design 2. Reliability 3. Responsiveness 4. Trust 5. Personalization
99(306)	Janda, Trocchia, and Gwinner (2002)	Internet retail service quality	1. Performance 2. Access 3. Security 4. Sensation 5. Information
87(315)	Yang, Cai, Zhou, and Zhou (2005)	Web portal quality	1. Usability 2. Usefulness of content 3. Adequacy of information 4. Accessibility 5. Interaction
103(271)	Collier and Bienstock (2006)	E-retail service quality	1. Functionality 2. Information accuracy 3. Design 4. Privacy 5. Ease of use
(269)	Yang and Jun (2002)	E-service quality	1. Reliability 2. Access 3. Ease of use 4. Personalization 5. Security 6. Credibility
86(208)	Bauer, Falk, and Hammerschmidt (2006)	Service quality in online shopping	1. Functionality/design 2. Enjoyment 3. Process 4. Reliability 5. Responsiveness
66(158)	Fassnacht and Koese (2006)	Quality of electronic service	1. Graphic quality 2. Clarity of layout 3. Attractiveness of selection 4. Information quality 5. Ease of use 6. Technical quality 7. Reliability 8. Functional benefit 9. Emotional benefit
55(190)	Li, Tan, and Xie (2002)	Web-based service quality	1. Responsiveness 2. Competence 3. Quality of information 4. Empathy 5. Web assistance 6. Call-back systems
46(140)	Yang, Jun, and Peterson (2004)	Online service quality	1. Reliability 2. Responsiveness 3. Competence 4. Ease of use 5. Security 6. Product portfolio
(135)	Kim and Stoel (2004)	Apparel website quality	1. Web appearance 2. Entertainment 3. Informational fit-to-task 4. Transaction capability 5. Response time 6. Trust
(124)	Long and McMellon (2004)	E-retail service quality	1. Tangibility 2. Assurance 3. Reliability 4. Purchasing process 5. Responsiveness
(114)	Cristobal, Flavian, and Guinaliu (2007)	E-service quality	1. Customer service 2. Web design 3. Assurance 4. Order management
(109)	Cai and Jun (2003)	Online service quality	1. Web site design/content 2. Trustworthiness 3. Prompt/reliable service 4. Communication
(105)	Gounaris and Dimitriadis (2003)	Web portal quality	1. Customer care and risk reduction benefit 2. Information benefit 3. Interaction facilitation benefit

Notes: Numbers of citation is from Web of Science and Google – WOS (Google) on 2013/10/22.

companies on FB are considered satisfactory by FB users. We adopt the software-Power Choice V2.5 to calculate our data.

3.1. VIKOR

Regarding the methodology used, Saaty (1980) suggested AHP could find the weights of multi-criteria, and so it has been widely adopted to identify the weight ratio with factors included in the decision-making process (Radcliffe & Schiederjans, 2003). The concept of AHP is to obtain the opinions of experts regarding the cases under study. However, the traditional AHP could not be used to reflect the cognitive decisions of people in a situation where the problems are not fully defined or where there is uncertain data. In order to remedy these inadequacies, the idea of Fuzzy AHP was introduced to solve uncertain problems (Van Laarhoven & Pedrycz, 1983).

VIKOR was built for the multi criteria optimization of complex systems that solve discrete decision problems which have non-commensurable and conflicting criteria. In other words, it determines the compromise ranking-list, the compromise solution, and the weight stability intervals for preference stability of the compromise solution obtained with the initial (given) weights (Fu, Chu, Chao, Lee, & Liao, 2011). VIKOR applies the concepts of 'acceptable advantage' and 'acceptable stability' to determine the maximum 'group utility of the majority' and the minimum 'individual regret of the opponent' and provides a compromise solution. Such a 'compromise solution' is a feasible solution that is closest to the ideal solution after taking into account certain mutually agreed concessions (Opricovic & Tzeng, 2004).

In the past, many studies applied methods as above to a wide range of topics, such as forestation district selection problem (Kaya & Kahraman, 2011), water resource planning (Opricovic, 2011), and evaluating hotel performance (Fu et al., 2011). However, not many studies have adopted FAHP and VIKOR to analyze e-SQ related issues, such as eWOM (Yeap, Ignatius, & Ramayah, 2014), a social recommender mechanism for e-commerce (Li, Wu, & Lai, 2013), and e-store business (Chiu, Tzeng, & Li, 2013). Therefore, this study aims to find an e-SQ measurement of social commerce (e-commerce + Web 2.0) as there are many uncertain factors for users and business involved in commercial activities on social media. Thus, it is appropriate for this article to adopt FAHP and VIKOR methods to find a priority of e-SQ factors from users and give suggestions to those companies that operate commercial activities on social media.

3.2. Data collection

After ranking the frequency with which dimensions appear in the e-SQ literature of Table 1 (Table 2), we then adopt an AHP questionnaire of users who have experience of ads linkages on FB (demographic profile of respondents as Table 3). We then utilize the Fuzzy AHP to analyze the weighting of the evaluation criteria (Table 4).

Table 2
Top rank of dimensions of e-SQ papers.

Dimension (abbreviation)	Factor (abbreviation)	Frequency
Reliability (REL)	Accurate and Reliable Service (ARS)	13
Responsiveness (RESP)	Accurate Description of Product (ADP)	13
	Sincere desire to Solve Problems for Customers (SSPC) Promptness in Response to Requests (PRR) Availability of Alternative Communication Channels (AACC)	
Information (INFO)	Providing Accurate Information (PAI)	13
	Providing Timely Information (PTI) Providing Easy to Understand Information (PEUI)	
Security (SECU)	Protecting Privacy (PP) Obtaining Permission before Creating a Personal Account (OPCPA) Assure Personal Information will Not be Shared with others (APINS)	10
Ease of use (EOU)	User-Friendly Website Interface (UWI)	8
	Clear Structure of Web site (CSW) Containing a Site Map (CSM)	
Trust (TRUS)	Having a Good Reputation (HGR) Always Keeping Promises (AKP)	6

Notes: (Abbreviation) means a code of dimension and factor in this article.

Regarding data collection, first, because the purpose of this study is to find the service quality of commercial activities on FB, it is necessary to filter the most important dimensions from the most cited e-SQ papers. Second, there are several reasons why we captured the experiences of 50 young FB users. Young adults are more likely than any other age group to have a social networking website and engage in higher levels of use (almost 3 hrs. /day) (Li & Chen, 2014; Pelling & White, 2009; Peluchette & Karl, 2008). Thus, for the weights of the individual criteria, a questionnaire incorporating pair-wise comparisons of the 6 dimensions and 16 factors was developed and issued to 50 young FB users for their responses. Regarding the sample, because the AHP method is not essentially statistically based, the absolute size of the sample is not a key issue in AHP analysis; rather, the key issue is whether the available observations constitute an accurate qualitative representation of the field under analysis (Dias & Ioannou, 1996;

Table 3
Demographic profile of respondents.

	Taiwanese		Foreigner	
Demographics Attribute n:	Male 9	Female 15	Male 21	Female 5
Average age	23.11	24.51	24.69	22.40
Education				
Master	8	9	6	1
Bachelors	1	6	15	3
High School				1
Experiences of using FB				
Under 1 year				
1–2 years	1	1	3	
2–3 years	5	5	4	
Over 3 years	3	9	14	5
Experiences of using ads links on FB				
Under 1 year	3	4	4	2
1–2 years	3	6	11	2
2–3 years	3	3	3	
Over 3 years		2	3	1

Table 4
Weighting ratio of e-SQ dimensions.

Dimension (weight)	Factor	Weight
REL (0.169)	ARS	(0.068)
RESP (0.123)	ADP	(0.004)
	SSPC	(0.005)
	PRR	(0.086)
	AACC	(0.004)
INFO (0.127)	PAI	(0.007)
	PTI	(0.031)
	PEUI	(0.031)
SECU (0.235)	PP	(0.115)
	OPCPA	(0.051)
	APINS	(0.077)
EOU (0.136)	UWI	(0.072)
	CSW	(0.040)
	CSM	(0.023)
Trust (TRUS) (0.200)	HGR	(0.084)
	AKP	(0.116)

Lam & Zhao, 1998). Six samples are enough to implement the AHP methodology (Fu et al., 2011). Therefore, in accordance with related research, we adopted Fuzzy AHP to compute the weightings of the individual criteria, as shown in Table 4.

Using the results of Table 2, we ranked the dimensions and factors from the most cited e-SQ literature; 6 dimensions and 16 factors were selected. The first three dimensions, namely, reliability, responsiveness and information, are most important among the e-commerce setting. Because this study aims to explore e-SQ measurements on social media; we adjusted factors of trust to fit the setting among FB and adopted items of 'likes' and 'talking about this' to replace 'having a good reputation' and 'always keeping promises'.

Table 3 shows the demographic profile of respondents; there are 24 (9 male + 15 female) Taiwanese and 26 (21 male + 5 female) foreigners. Their average age is 23.68 years old and their highest education is mostly master and bachelor degrees. The years of experience of using FB is mostly around 2–3 years and over 3 years, and most respondents cited having using links ads on FB for 1–2 years. In addition, this study avoids cultural differences; except for respondents of Taiwan, the foreigners are from 17 countries of North America, South America, European and Asia. As discussed above, our sample of respondents is appropriate for social networking websites and the AHP method.

Regarding the numbers in Table 4, we ran the AHP data of respondents and transferred them to become a weighting of FAHP. These results show that the three most important dimensions of FB users are SECU (security), TRUS (trust) and REL (reliability). These are followed by the dimensions of EOU (ease of use), INFO (information), and RESP (responsiveness). Regarding the consistency ratio (C.R.) = 0.00833, Saaty (1980) suggested that CR $\leqq$ 0.1 is acceptable for the consistency of a questionnaire.

3.3. Evaluating the e-SQ of commercial activities on Facebook

This study used the weighting of FAHP and applied the VIKOR method to evaluate commercial activities on FB of global brands. We selected companies of global brands 2013 from Interbrand (http://www.interbrand.com) and set priorities for brand selection, such as top 5 of brand rank, first rank of each top five sectors and top 5 changes in positive brand value. The settings of selection priorities avoided centralizing samples on top brands and decentralizing samples to sectors and value changes (Table 5). However, due to Apple and Amazon not having official FB accounts, we had to erase these two companies from our evaluation list.

Table 5
Companies selected from the best global brands 2013 for investigating commercial ads on social media.

Top 5 of brand rank		First rank of each top five sector		Top 5 of change in brand value		2013/2012
Rank	Brand name	Rank	Brand name	Rank	Brand name	+%
1	Apple	10	Toyota	52	Facebook	+43%
2	Google	16	Gillette	2	Google	+34%
3	Coca-Cola	1	Apple	72	Prada	+30%
4	IBM	23	American Express	1	Apple	+28%
5	Microsoft	17	Louis Vuitton	19	Amazon	+27

The differences of evaluating e-commerce and social commerce are that the dimensions of e-SQ will be allocated in FB and the homepages of companies (Hof, 2011) as shown in Fig. 1. Those dimensions that relate to product information, service, and responses to FB users' comments, as REL, INFO and RESP are presented on the FB side. This is followed by the dimensions; TRUS is a key for FB users' decision to link to the homepages of companies, because whether a company has a good reputation affects consumers' trust in the ads linkage to FB users. While linking from FB to companies' homepages, FB users are concerned about privacy protection and ease of use on the website (e.g., SECU, EOU).
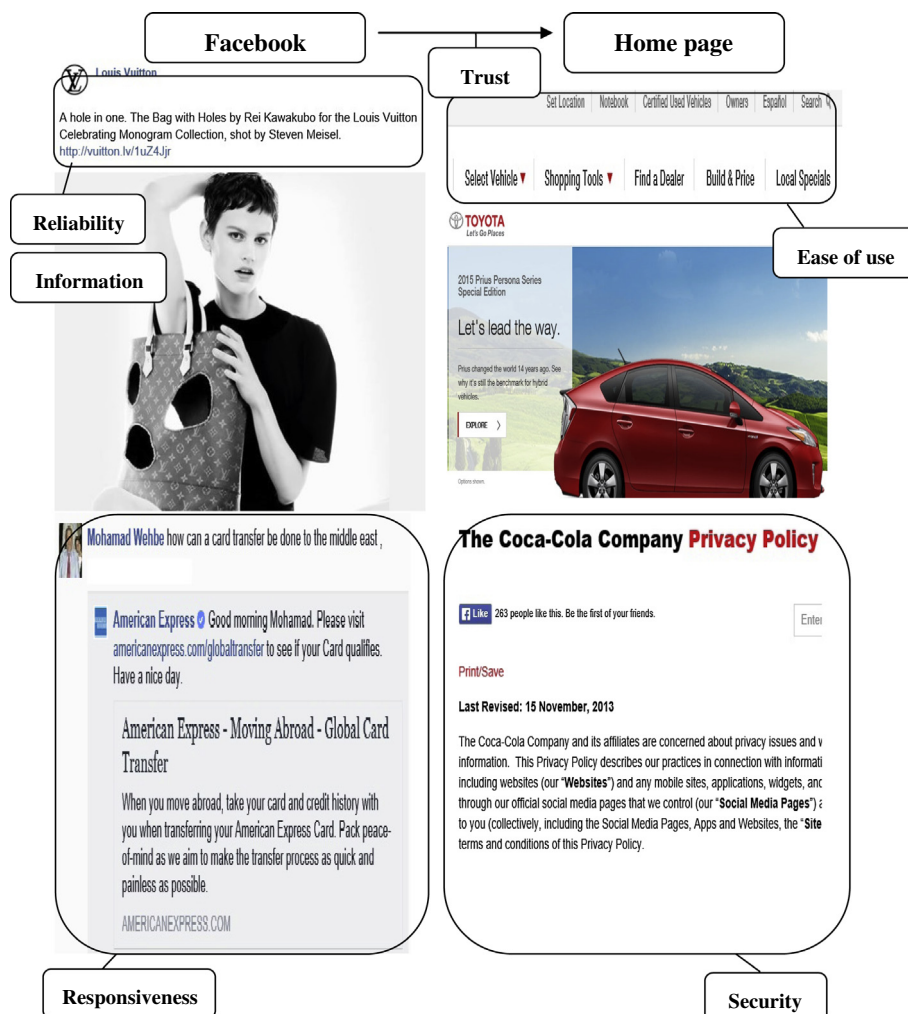
Regarding the evaluation score, two graduate students were asked to score (Table 6) their FB activities and linkage of homepages, and an independent graduate student was assigned to check the consistency of the score of the evaluation. The items of evaluation include function judgment (Yes/No) and scoring the function (low to high: 1–5). For instance, (1) while evaluating a brand's e-SQ function, we utilized data of the brand's FB activities over 2 weeks (2) If a brand had an ADP function, we checked the "Yes", then compared its performance with other brands and gave it a score (1–5). Otherwise, we checked the "No", and gave a score of "0".

4. Results

VIKOR, as shown in the discussions above, determines the compromise ranking-list, the compromise solution, and the weight stability intervals for preference stability of the compromise solution obtained with the initial (given) weights.

After executing the software Power Choice V2.5, the results are as shown in Table 7. The definitions of S_j, R_j and Q_j – (1) S_j are the distance from the best solutions, and smaller value of S_j corresponds to

Fig. 1. Description of evaluating commercial activities on FB.

Table 6
Evaluation of brands' activities on FB with e-SQ criteria.

No.	Dimension	Factor	Yes	No	1	2	3	4	5
1	REL	ADP	v						v
		ARS		v					
		SSPC	v			v			

Table 7
VIKOR – S_j, R_j and Q_j value and ranking.

Global	Brands rank 2013	S_j	Rank	R_j	Rank	Q_j	Rank
52	Facebook	0.000	1	0.000	1	0.000	1
3	Coca-Cola	0.116	2	0.169	3	0.285	2
4	IBM	0.367	6	0.157	2	0.380	3
23	American Express	0.125	3	0.358	5	0.438	4
5	Microsoft	0.152	4	0.365	6	0.518	5
10	Toyota	0.262	5	0.380	8	0.642	6
17	Louis Vuitton	0.376	7	0.308	4	0.648	7
16	Gillette	0.422	8	0.378	7	0.801	8
72	Prada	0.463	9	0.500	9	0.963	9
2	Google	0.500	10	0.500	10	1.000	10

better performance. (2) R_j is the distance from the worst solutions, and the smaller value of R_j corresponds to better performance. (3) $Q_j = v \ (S_j - S^*)/(S^- - S^*) + (1 - v) \ (R_j - R^*)/(R^- - R^*)$. According to the VIKOR method, when the parameter value v increases (0.5), Q_j leans toward the majority, and when the parameter v decreases, Q_j leans toward the minority opposition. Furthermore, not only is the value of Q_j able to consider majority votes at the same time, but it also has the ability to serve as a guard against an overly low performance of a certain criterion. The smaller the value, the higher is the performance (Opricovic & Tzeng, 2004).

Regarding the results of FAHP (Table 4), the dimensions of SECU, TRUS, REL have more weighting than others. Findings in the research of Akinci, Atilgan-Inan, and Aksoy (2010) indicated that the effects of e-SQ are not proportionally equal; they specifically highlighted the dimensions of efficiency (design of website, user interface) and fulfillment (website's behind-the-scenes infrastructure). However, our findings are not parallel to those Akinci et al. (2010) proposed. The difference is that social commerce crosses platforms of social media (e.g., Facebook) and e-commerce (e.g., company's website). In other words, when consumers click the link and cross to other platforms, the dimensions which consumers emphasize will differ from previous e-SQ researches.

Indeed, during the process of the investigation, we also found that FB users, before linking to ads, will think of these three dimensions and their potential problems, such as Phishing, internet fraud, and leaking personal information. But how do businesses convince FB users to click on the linkage icon? The VIKOR results show that the top three ranking companies (Q_j rank) – Facebook, Coca-Cola and IBM – have characteristics in common. First, they have a large number of "likes" and "talking about this", because FB users always trust friends' "likes" and others' "talking about this" (Vinerean, Cetina, Dumitrescu, & Tichindelean, 2013). Second, the security function of the homepages belonging to these companies have an announcement about privacy protection and give a detailed explanation before you apply for an account on their websites. Third, they always show their reliability on FB, such as posting accurate descriptions of products on FB (Lee & Shin, 2014) and usually respond to the comments from FB users. In summary of the above discussions, we suggest that companies should pay more attention to the security of their website, establish a good reputation on social media and promote continuous interaction with FB users (Porter, Donthu, MacElroy, & Wydra, 2011).

Other dimensions, such as EOU, INFO, RESP, will influence the intention of users to visit or link ads again. Taking the user-friendly website interface as an example, we found that there are not many companies with the function of automatic language-detection when users link to their FB pages or homepages. In addition, that the companies provide accurate information and timely information is a critical point to attract users' attention (Taylor, Lewin, & Strutton, 2011). For the last dimension, RESP, we suggest companies be prompt in their response to requests via the function of FB comments and provide alternative communication channels for FB users (e.g., hyperlink to their homepages or pages of customer service).

During the evaluation of brands, we also found some brands that have FB pages but rarely maintain a relationship either by interacting with their fans or responding to comments on their product or service; instead, they simply add photographs of their product or commercial activities. According to the preferences of FB users (i.e., weighting of dimensions), these companies will not be liked by FB users. Moreover, there is no positive relationship between brands' ranking and our results. We infer that some companies already have high brand awareness worldwide and so are not concerned about the interaction with customers in the virtual world.

5. Conclusions

Past e-SQ research focused on topics related to consumers' experience of online shopping, e-SQ construct identification, and e-SQ measurement effort. However, the development of Web 2.0 and the rapid rise in the use of social media has led to the formation of a new Internet commerce model (i.e., social commerce); which includes characteristics of interaction between each user and business on a social networking platform. This new Internet commerce model and its characteristics have changed the previous e-commerce setting, and in particular, the aspect of e-SQ is rarely mentioned. We selected the most cited dimensions of e-SQ and rank their weighting via respondents of various countries. Further, we utilized the VIKOR method to find which brands are liked by FB users.

In accordance with the results of this study, we suggest businesses' first priority should be to pay more attention to their brand's reputation, the security of their website, and the interaction with users on social media, because these functions are the ones users most care about. Second, we recommend businesses set up a function of language auto direct for non-English users so they can understand the content of the website easily. In addition, it is important that businesses always keep accurate and new information of their products or services. Finally, they should respond promptly to users' comments and provide alternative communication channels for users. These functions will influence users' intention to click ads linkages and visit the website again. In summary, the knowledge of consumers' evaluation of commercial activities on social media will equip companies with a sustainable competitive advantage.

In terms of collaborative learning, it is a method of learning in which students together to explore a significant question. In this study, 50 participating students from various countries have learned new aspects of e-SQ on social networks and express their preference about this issue. This study also finds that there are different priorities of e-SQ dimensions between local and foreign students. For example, local students view the trust dimension (weighting: 0.253) as first priority for e-SQ on social networks while foreign students regard the security dimension (weighting: 0.295) as their first priority instead.

It is also necessary to recognize the limitations of the present study. First, this study utilizes the most frequently cited dimensions of e-SQ to evaluate a new Internet commerce setting (e.g., e-commerce + Web 2.0 or social commerce); however, this

may be not enough to cover all the features of social commerce. Next, there is a suggestion regarding the limitation of the number of elements (dimensions or factors), as Saaty (1980) recommended each level of dimensions or factors should not exceed seven items; otherwise, it would be too complex for people to answer the AHP questions. Under these conditions, this study could identify only appropriate e-SQ dimensions within these limits. However, there is an opportunity for us to utilize the results of this study and apply methods of exploratory factor analysis and structural equation modeling to develop a new and suitable e-SQ scale for social commerce.

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