

Consequences of Customer Engagement in Social Networking Sites: Employing Fuzzy Delphi Technique for Validation

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Abstract—The consequences of the customer engagement in the Social Networking Sites (SNS) community have direct impact on the brand. This present research was conducted to examine the cohesive mechanisms for item verification on the most influential consequences of participating the brand community and joining the electronic Word-of-Mouth (eWOM) as the manifestation of the behavior of such communities. Using Fuzzy Delphi techniques, a total of 12 heterogeneous experts are involved in the verification process through a 7-point linguistic scale of the questionnaire survey. The results show good evidence of expert consensus by reaching 75% for each consequence of the engaged customers. On the SNS platform, further aspects of the inspected effects can be expanded to be studied on relevant domains. Practitioners will be more strategic in maintaining and fostering customer relationships, and consistently influencing new customers when interacting actively through SNS brand pages.

Keywords—Customer engagement; fuzzy delphi; SNS; consequences; brand page

I. INTRODUCTION

The explosive growth of Social Networking Sites (SNS) is the basis for firms to open space for customer engagement in the proliferation of brand-related ideas, information, and thought surrounding their network venture. In the circle of electronic Word-of-Mouth (eWOM) activities, customers and prospects use SNS not just to acquire information but to engage with brand and products [1]-[2]. Customers are equipped with the brand pages that are created by firms for marketing and communication activities related to brand and products. These pages are able to tie existing customers and catch the prospect's attention due to the firms' series of repeated and effective strategies, for an instance, posting the good copywriting to advertise a newly-launched product.

Notwithstanding the evidence, engaging customers and ensuring their commitment to the online community is a critical task for the brand to succeed. The online marketing initiatives has put a big challenge on most brands in the aspects of broadcast advertisements, messages, and campaigns

by firm marketers that are usually influenced by community partners and ultimately alter the customer's decision beyond the transaction [3]-[5]. The postal content generated by marketers via the brand pages are greatly affected by various types of data manipulated through User-Generated Content (UGC) in the form of audio, video, images, animation and text [6]. Such activities are the reaction of customers that occur when they are stimulated by the factors around their communities.

The core of the relationship between the customer, the firm, and the brand is through the virtual customer engagement [7]-[8]. In particular, there is a demand to provide a broader view of the online community in the social media landscape [9]-[11]. The concept of customer engagement is the need for a brand to handle online affairs more effectively and overcome the firm's challenge to understand the exact mechanism to measure online customer preferences and reactions.

Customer engagement is an evolving concept of relationship marketing theory that stands as a key role motivated by various drivers, thereby delivering impact on other consequences (see [12]-[16]). In consumer behaviour research, this principle theory is anchored with service-dominant logic and social exchange theories in which are mutually complementing in terms of the body knowledge contribution. The lens of service-dominant logic has centralized the notion of customer engagement on the value co-creation of firm-customer exchange in the network of interactive service system [17]-[18]. According to [19]'s social exchange theory, customers are predicted to respond positively to their thoughts, feelings, and behaviors towards the brand as they are motivated by certain future returns from established obligations [20]. Communities interacting with SNS have acknowledged the tendency of customers to be grateful and reciprocate by repaying the benefits they acquired in the process of exchanging with the brand.

Dominantly, online customer engagement can be assessed through three main dimensions - cognitive, affective and

behavioural – as treated by various researchers in different field areas [10], [21]. This study, however, argues about the importance of customer behavior within the SNS community. The behavioral aspect profoundly seen as priority since it serves as a strong indicator of customer engagement in social media and supported by many claims in previous studies [8], [22]-[24]. Manifesting behavior from such customers includes all kinds of behaviours that they translate beyond purchase arrangements; such as suggestions for service improvements, product purchasing insights, search of brand and product information, and sharing of usage experience with other customers. Each of their behaviours in the app interface panel greatly determines the involvement of other community members to the brand.

It is clear that the study referred to customer engagement within social media community is increasingly important [2], [25]-[26]. These scholars focus on examining the intangible indicators that pose impacts to the engagement domain, for examples reputation, advocacy, and others. In spite of this, literature recognizes the lack of agreement on research of the consequences of customer engagement [21]. While the impact of customer engagement in the communities studied is more important as it determines the restructuring of a more effective strategy by the brand for achieving better business objectives, scientific research investigating the behavior of customer engagement in the SNS is rarely implemented [27]. In the similar consonant, authors call for more research to gain insights on social media use as an effective integrated marketing tools [28]-[30]. The development and verification of indicators to assess the involvement of the community in SNS activities can meet the claims of those researchers.

Therefore, to encourage future research on the consequences of customer engagement in behavioural dimension within the SNS community, it is essential to have a systematic approach to validate the indicators. The study seeks to obtain a consensus of experts relating to the development and validity of the proposed consequences of customer engagement due to the scarcity of works conducted to this date. The effective tool that will be used in this case is the Delphi Fuzzy technique in which is expected to work very well as the validity measurement of the variables studied. Thus, the objective of this study is:

What is the level of agreement among experts towards the indicators for evaluating the behavioral manifestation from the engaged customer (consequences) via the SNS platform?

The rest of the article presents the conceptualization of customer engagement in SNS held by this study, followed by the methodology section to elucidate the implementation of Fuzzy Delphi approach to achieve the above objective.

II. CONCEPTUAL FRAMEWORK

Firms must accommodate opportunities to encourage customers in the participation of product review, exchange information, development, and innovations [31]-[32]. These activities can be reached when members of the online community continue to communicate in the direction of bilateral in their post-engagement in SNS through the eWOM

network. Brand proactive activities will increase the participation of more customers in the community, in turn will add the concept of sharing and dissemination of brand information. Subsequently, customers involved in the SNS platform are believed to have shown certain reactions of behavior as a result of intent to show their involvement.

This study put a debate on the increases of eWOM and the active participation in brand community as the prominent consequences that symbolizes the behavioral of engaged customers in SNS. Furthermore, knowing the consequences are even more important for firms to get valuable insights of what outcomes after customers are considered as engaged person, hence giving input to their online marketing strategies to be reviewed and optimized as to making them parallel with the business goals. The conceptualization of customer engagement and it's consequences in the SNS brand page is illustrated in Fig. 1 below.

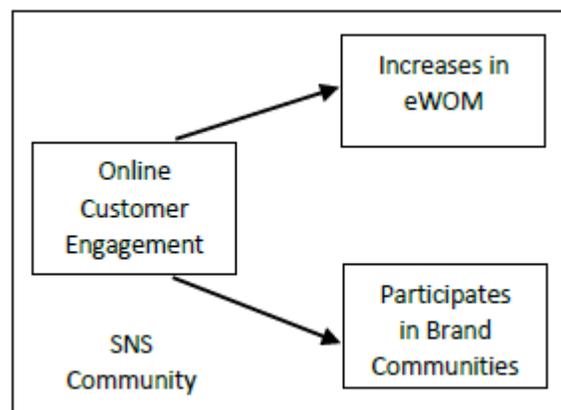


Fig. 1. Conceptual Framework of Customer Engagement in SNS

A. Increases in Electronic Word-of-Mouth (eWOM)

Positively engaged customers are likely communicating in positive eWOM about firms, brands and products. In adjustment with the context of this study, eWOM was labelled as “SNS environment which create new forms of group conversations in communities, with large numbers of participants participate in different roles and stages, allowing potential and existing customers to positively express statement and exchange information about a brand, product or a firm” [33]-[35].

In the literature of marketing and communication, two important dimensions that conceptualize social influences of customers’ attitudes and behaviors in the eWOM process are opinion leadership and opinion seeking [35]-[36]. The exceptional growth of SNS offers opinion leaders with the ability to strengthen their interpersonal characteristics by motivating other community fellows, hence will encourage the eWOM development [37]. Relatively posses lower product knowledge, opinion seekers actively search information and advice in a given category [35]. Another important dimension in eWOM is online pass-along behavior [38] in an attention to provide the community SNS members with a useful tool to exchange meaningful information and past worth experiences about brand and product [37].

B. Participates in Brand Community

The first concept of brand community introduced to the marketing literature is proposed by [39], defined as “a specialized, non-geographically bound community, based on a structured set of social relationships among admirers of a brand”. The engaged customers are experienced customers with the focal brand, hence, they highly possible to deliver some valuable knowledge-sharing information to advise and to influence community peers essentially by helping each other and fixing each other’s problems with the brand [40]. The engaged customers’ activities will attract and influence enormous potential customers who interest about the brand to participate and constructing larger groups, and performing many important tasks on behalf of the brand [18], [25].

As a quest to universally connecting all benefits of brand communities announced by prior studies, [26] had identified a diverse set of dimensions which is empirically tested to gain insight of brand communities’ motivational drivers – brand influence, connecting, helping, like-minded discussion, seeking assistance, self-expression and up-to-date information. Adapted from these empirically tested measures, this study aims to test the relationship between customers engaged with brands with the SNS community in which they are located.

TABLE I. CONSEQUENCES OF CUSTOMER ENGAGEMENT IN SNS, CONCEPTUAL FRAMEWORK OF CUSTOMER ENGAGEMENT IN SNS

Author(s)	Consequences of customer engagement							Context, research type
	* Participates in Brand Community	* electronic Word of Mouth (eWOM)	Brand Loyalty	Brand Satisfaction	Advocacy	Firm's performance	Online Review Intention	
[12]		√					√	Offline, conceptual
[41]	√	√						Online social platform, conceptual
[7]			√	√				SNS, empirical
[42]	√	√	√					Offline, conceptual
[1]	√							Online community, conceptual
[14]							√	Social media, empirical
[27]			√					SNS, empirical
[8]			√					Social media, empirical
[16]							√	Mobile devices, empirical
[43]					√	√		Offline, conceptual

In this study, the manifestations of customers involved in SNS is confined within a one-dimensional outcome - which is behaviour. Following the exploration of previous works (refer Table I where the constructs of behaviour dimension are marked with *), it is strongly believed that these two consequences could result in significant relationships with the

domain of customer engagement using the Delphi Fuzzy method. To achieve results, the manuscript on hand has adjusted 9 items to *Increases in eWOM* from [37] and [44], as well as 24 items were drawn and coordinated from [26] to *Participates in Brand Communities* to measure the scale of customer engagement behavior as conceptualized in Fig. 1.

III. METHODOLOGY

Fuzzy Delphi technique has been utilized by this study to validate the conceptual framework of customer engagement in SNS as well as adapted measurement scales. Inspiration of the use of Fuzzy Delphi is derived from the effectiveness of the results in various types of IT/IS research variations presented by [45]. This tool is a very helpful method when the level of research requires approval from a group of experts. In addition, the Fuzzy Delphi technique is an interesting method of collective decision-making about the blurred ideas of the alignment of experts' opinions [46]. Their responses can be implemented in a short time because of the use of survey methods in parallel with the lower cost and experts can fully express their true response without misinterpretation to ensure perfection and consistency of opinion [47].

The whole methodology is done by dividing the processes into four major stages. The first stage is prior to the Delphi Fuzzy technique is performed where the items to be certified by experts are developed. The second stage refers to the selection of 12 appropriate experts from the background of the academic and business fields. The third stage is related to data collection activities from designated experts within a certain period of time. The final stage is definitely an analysis process in terms of generating significant relationships between the latent variable for review, customer engagement and the two identified consequences. Table II(A) and II(B) illustrates the four levels mentioned.

A. Instrument Development

The formation of a questionnaire instrument was conducted after the identification of two of the leading consequences of SNS's customer engagement (as presented in Table I). In order to meet the criteria of measurement items that are expected to yield significant results, these items are withdrawn from the relevant prior research. The statement of these questions has been modified to conform to the context and environment of the SNS medium to be studied. These 42 questions were reviewed in terms of content and format at the beginning by 3 academicians in the relevant field of social media and business. In conjunction with this, two language specialists, an English language lecturer and another Malay language lecturer were also invited to evaluate the suitability of the item presented. Some improvements have been made to the content of the question with the aim of enhancing the clarity and ease of formatting. Adaptive questions from previous studies with different mediums and samples can affect the reliability and validity of items to be tested in real surveys. Therefore, this present study has taken into account the views of practitioners (in this case the Small Medium Enterprises (SME)) through small-scale structured interview sessions to validate items captured from literature [45]. The examined set of items is then properly formatted into the questionnaire as outlined in Table II(A).

B. Sampling and Selection of Respondents

The expert group required for this study is from those who meet the following criteria: knowledge and experience with issues being examined, ability and willingness to participate, qualification, individual character, comparative ability, communication skills as well as consistent and credible within

their respective fields [46], [48]. Hence, this study has chosen the purposive sampling through the identification of 12 skilled experts in one or more of the following areas: IT, social media, online governance, marketing, and consumer behaviour.

TABLE II. (A).FUZZY DELPHY – STAGES OF INSTRUMENT DEVELOPMENT, SELECTION OF EXPERTS AND DATA COLLECTION, CONCEPTUAL FRAMEWORK OF CUSTOMER ENGAGEMENT IN SNS

Instrument development																										
Content	Approach	Measurement items																								
A questionnaire form with 42 items and was divided into four sections: 1) Cover page 2) Demographic of respondents 3) Item questions in 7-Lickert scale 4) Spaces for comment	Adapted scales from relevant literature (refer Table I)	<table border="1"> <thead> <tr> <th>Latent variable</th> <th>Adapted Scales</th> <th>Number of item scales</th> </tr> </thead> <tbody> <tr> <td>Online Customer engagement</td> <td>[14], [54], [55]</td> <td>9 items</td> </tr> <tr> <th>Consequences</th> <th>Adapted Scales</th> <th>Number of item scales</th> </tr> <tr> <td>Participates in Brand Communities</td> <td>[26]</td> <td>24 items</td> </tr> <tr> <td>Increases in WOM</td> <td>[37], [44]</td> <td>9 items</td> </tr> <tr> <td colspan="2">Total</td> <td>42 items</td> </tr> </tbody> </table>	Latent variable	Adapted Scales	Number of item scales	Online Customer engagement	[14], [54], [55]	9 items	Consequences	Adapted Scales	Number of item scales	Participates in Brand Communities	[26]	24 items	Increases in WOM	[37], [44]	9 items	Total		42 items						
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Selection of experts and data collection																										
Technique	Approach	Classification of experts																								
Purposive sampling by identifying, contacting and confirming the experts to be participants	<u>Form delivery</u> A scheduled and face-to-face meeting based on experts' availability <u>Form collection</u> Returned forms either by face-to-face or submission via email	<table border="1"> <thead> <tr> <th>Experts</th> <th>Institution/Sector</th> <th>Number of participants</th> </tr> </thead> <tbody> <tr> <td rowspan="6">Academicians</td> <td>UTeM (IT domain)</td> <td>2</td> </tr> <tr> <td>UTeM (Business domain)</td> <td>1</td> </tr> <tr> <td>UITM (IT domain)</td> <td>1</td> </tr> <tr> <td>UITM (Business domain)</td> <td>1</td> </tr> <tr> <td>UPM (IT domain)</td> <td>1</td> </tr> <tr> <td>Polytechnic (IT domain)</td> <td>1</td> </tr> <tr> <td rowspan="2">Practitioners (SMEs)</td> <td>Manufacturing</td> <td>2</td> </tr> <tr> <td>Services</td> <td>3</td> </tr> <tr> <td colspan="2">Total</td> <td>12</td> </tr> </tbody> </table>	Experts	Institution/Sector	Number of participants	Academicians	UTeM (IT domain)	2	UTeM (Business domain)	1	UITM (IT domain)	1	UITM (Business domain)	1	UPM (IT domain)	1	Polytechnic (IT domain)	1	Practitioners (SMEs)	Manufacturing	2	Services	3	Total		12
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A total of 12 experts were taken from the suggestion of [49] which states that heterogeneous sampling requires between 10 and 35 experts. The experts who come from different profiles and backgrounds are made up of 7 academics and 5 practitioners (refer Table II(A) for the classification). By using email and follow-up via phone calls, they have been invited to take part in the survey and agreement have been dealt with as soon as they give consent.

By scheduling different meetings, a face-to-face approach with these 12 designated experts are carried out to provide an explanation of the items reviewed if any issues arise. The questionnaires are then distributed and the item verification process from each expert is conducted based on the procedures outlined. This level ends with the collection of forms at different times where the items being evaluated are ready to be analyzed using the Fuzzy Delphi method in Microsoft Excel.

TABLE II. (B). FUZZY DELPHY – STAGES OF DATA ANALYSIS

Data analysis									
<p><u>Step 1</u> The determination of triangular fuzzy numbers</p>	Linguistic variables		Fuzzy scales						
	Strongly Disagree	0.0	0.0 0.1						
	Disagree	0.0	0.1 0.3						
	Somewhat Disagree	0.1	0.3 0.5						
	Neither agree or disagree	0.3	0.5 0.7						
	Somewhat agree	0.5	0.7 0.9						
	Agree	0.7	0.9 1.0						
	Strongly agree	0.9	1.0 1.0						
All linguistic variables used in the questionnaire are transformed to triangular fuzzy numbers [50].									
<p><u>Step 2</u> The determination of average responses</p>	<p>Next, the average value of each expert's response will be calculated with the following equation (1):</p> $m = \frac{\sum_1^n m_i}{n} \quad (1)$								
<p><u>Step 3</u> The determination of threshold value ("d")</p>	<p>The threshold value ("d") between two Fuzzy numbers (m= m₁, m₂, m₃) dan (n= n₁, n₂, n₃) is then computed using the equation (2):</p> $d(\bar{m}, \bar{n}) = \sqrt{\frac{1}{3} [(m_1 - n_1)^2 + (m_2 - n_2)^2 + (m_3 - n_3)^2]} \quad (2)$ <p>This "d" value must be <= 0.2 to reach an agreement of all experts, based on [50]-[51].</p>								
<p><u>Step 4</u> The determination of group consensus</p>	<p>The overall value of the items in each construct is assessed to exceed 75% in order to reach the group agreement [50], by using the formula (3) as the following:</p> $\frac{\text{Total of "d"} < 0.2 \times 100}{\text{Total of experts}} \quad (3)$								
<p><u>Step 5</u> The identification of defuzzification and ranking of items</p>	<p>To calculate the defuzzification, either of these formulas (i or ii or iii) can be used:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tbody> <tr> <td>i</td> <td>$A_{\max} = \frac{m_1 + m_2 + m_3}{3}$</td> </tr> <tr> <td>ii</td> <td>$A_{\max} = \frac{m_1 + 2m_2 + m_3}{4}$</td> </tr> <tr> <td>iii</td> <td>$A_{\max} = \frac{m_1 + 4m_2 + m_3}{6}$</td> </tr> </tbody> </table> <p>The resulting score numbers (defuzzification) must be in the range 0 to 1 [56] and the value of alpha-cut must be exceeding 0.5 [52]-[53] to indicate the expert consensus.</p>			i	$A_{\max} = \frac{m_1 + m_2 + m_3}{3}$	ii	$A_{\max} = \frac{m_1 + 2m_2 + m_3}{4}$	iii	$A_{\max} = \frac{m_1 + 4m_2 + m_3}{6}$
i	$A_{\max} = \frac{m_1 + m_2 + m_3}{3}$								
ii	$A_{\max} = \frac{m_1 + 2m_2 + m_3}{4}$								
iii	$A_{\max} = \frac{m_1 + 4m_2 + m_3}{6}$								

C. Data Analysis using Fuzzy Delphi

The analysis was conducted with the aim to prove that the individual item and the overall examined constructs - *Customer Engagement* and the two consequences namely *Increases in eWOM* and *Participates in Brand Communities* - are the valid model and will be eligible as the measurement items for the actual survey in the following research phase. Overall, the Fuzzy Delphi systematic analysis needs to be through 5 steps to obtain the final decision.

As summarized in Table II(B), data collected in the form of linguistic scales should first be altered to fuzzy triangular

numbers [50]. This is done for each expert before following the next procedure, determining average responses. Therefore, in the third step, the calculation of the threshold value ("d") for each item and construct is calculated to ensure that the decision does not exceed 0.2 to reach an expert agreement [50]-[51]. The overall value of items in each construct is then assessed to obtain a minimum of 75% in order to reach the group's consent [50]. This analysis ends by calculating the defuzzification value for each item in prioritizing its position according to the construct [52]-[53]. Each of the above steps has been presented distinctly in Table II(B).

TABLE III. VALUE “d” OF ITEM, VALUE “d” OF CONSTRUCT, % OF EXPERTS CONSENSUS, DEFUZZIFICATION AND ITEM RANKING FOR *ONLINE CUSTOMER ENGAGEMENT* (Q1 – Q9)

Expert	ONLINE CUSTOMER ENGAGEMENT								
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9
1	0.22	0.03	0.06	0.06	0.04	0.09	0.05	0.03	0.11
2	0.05	0.03	0.06	0.06	0.04	1.26	0.05	0.03	1.24
3	0.17	0.03	0.10	0.06	0.14	0.19	0.11	0.03	0.11
4	0.05	0.03	0.06	0.06	0.04	0.09	0.28	0.27	0.19
5	0.17	0.14	0.10	0.09	0.14	0.19	0.11	0.13	0.21
6	0.17	0.14	0.10	0.09	0.14	0.19	0.11	0.13	0.21
7	0.22	0.26	0.30	0.06	0.26	0.21	0.28	0.27	0.19
8	0.17	0.14	0.10	0.09	0.14	0.19	0.11	0.13	0.21
9	0.05	0.03	0.06	0.06	0.55	0.09	0.05	0.03	0.11
10	0.52	0.26	0.10	0.09	0.14	0.19	0.11	0.13	0.21
11	0.17	0.14	0.10	0.09	0.14	0.19	0.11	0.13	0.21
12	0.05	0.03	0.06	0.06	0.04	0.09	0.05	0.03	0.21
Value “d” of each item	0.17	0.10	0.10	0.07	0.15	0.25	0.12	0.11	0.27
Value “d” construct	0.15								
Percentage (%) of expert consensus for each item	75%	83%	92%	100%	83%	83%	83%	83%	42%
Percentage (%) of expert consensus for construct	81%								
Defuzzification	0.84	0.86	0.90	0.91	0.86	0.82	0.88	0.87	0.79
Item ranking in each construct	7	5	2	1	6	8	3	4	9
Item content	Spend a lot of time using [brand]	Usually use [brand] when use [category]	Inform positive things about [brand]	Recommend [brand] to other people	Read messages on [brand] post	Like messages on [brand] post	Write comments on [brand] post	Share messages on [brand] post	Follow the [brand] page

IV. RESULT

Fuzzy Delphi analysis that has been implemented on 42 items has met the objective with compelling results. Available in Table III are the results obtained for *Online Client Engagement* in the dimensions of the behaviour as a latent construct under investigation. Boxes marked with colour display values of “d” above 0.2, indicating that some experts disagree with the items reviewed.

However, unmarked boxes have a much larger number, concluding that most items are relevant in their view. It has

reached a member consensus percentage of more than 75%, and defuzzification score of individual items is greater than 0.5. With the defuzzification scores, the item ranking can be calculated to know the priorities. Counting scores displaying two items that tend to be an expert choice are the similarity of questions that put forward suggestions and positive feedback about the brand initiated by a customer to other prospects or customers within the community they are interacting with (refer Q3 and Q4).

TABLE IV. VALUE “D” OF ITEM, VALUE “D” OF CONSTRUCT, % OF EXPERTS CONSENSUS, DEFUZZIFICATION AND ITEM RANKING FOR INCREASE IN ELECTRONIC WORD-OF-MOUTH (EWOM) (Q10 – Q14)

Expert	INCREASES IN EWOM				
	Q10	Q11	Q12	Q13	Q14
1	0.07	0.05	0.05	0.07	0.16
2	0.07	0.05	0.05	0.07	0.05
3	0.19	0.17	0.05	0.19	0.16
4	0.49	0.52	0.21	0.20	0.23
5	0.19	0.17	0.18	0.19	0.16
6	0.19	0.17	0.18	0.19	0.16
7	0.07	0.05	0.05	0.07	0.05
8	0.19	0.17	0.18	0.19	0.16
9	0.49	0.22	0.21	0.79	0.23
10	0.20	0.22	0.50	0.20	0.53
11	0.19	0.17	0.18	0.19	0.16
12	0.07	0.05	0.05	0.07	0.05
Value “d” of each item	0.20	0.17	0.16	0.20	0.17
Value “d” construct	0.18				
Percentage (%) of expert consensus for each item	83%	75%	75%	92%	75%
Percentage (%) of expert consensus for construct	80%				
Defuzzification	0.82	0.84	0.83	0.82	0.85
Item ranking in each construct	5	4	2	3	1
Item content	Persuade contacts in the SNS to buy products of [brand]	Influence the contacts’ opinions about [brand] and its products	Ask contacts in the SNS for advice in considering new products	Get contacts opinions in the SNS before buying new products of [brand]	Pass along the [brand] related information or opinion to other contacts in the SNS

On the other hand, an assessment of the 9 items in the eWOM construct returned the unpredictable results initially. This is because nearly half of the threshold item value (“d”) has exceeded 0.2 indicating the disagreement of experts on some adapted items from the previous context and research setting. To achieve a good overall agreement, this study has released 4 individual items with the lowest percentage of “d” value (not reaching 75%). Consequently, the scale supporting the *Increase in eWOM* measurements is comprised of only 5 items left as these have the percentage of expert consensus for more than 75%, contributing the total consensus of 80%. Refer Table IV.

According to the same table, score numbers (defuzzification) lie between 0 and 1 [56]. The value of alpha-cut is calculated to be greater than 0.5 [52]-[53] to support the consensus of experts on 5 items for the eWOM consequence. Attitudes to conveying brand-related information to their contact network at SNS are the most accepted items by experts who evaluate the question. Online subscribers are also interested in soliciting opinions or suggestions of members of the branded site community about their new favorite product release.

TABLE V. (A). VALUE “d” OF ITEM, VALUE “D” OF CONSTRUCT, % OF EXPERTS CONSENSUS, DEFUZZIFICATION AND ITEM RANKING FOR PARTICIPATES IN BRAND COMMUNITIES (Q15 – Q24)

Expert	PARTICIPATES IN BRAND COMMUNITIES									
	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24
1	0.03	0.03	0.11	0.09	0.06	0.08	0.06	0.03	0.10	0.10
2	0.03	0.03	0.05	0.06	0.06	0.08	0.09	0.03	0.06	0.06
3	0.03	0.03	0.05	0.06	0.09	0.08	0.06	0.03	0.06	0.06
4	0.26	0.28	0.29	0.06	0.06	0.08	0.09	0.03	0.06	0.06
5	0.14	0.12	0.11	0.09	0.09	0.08	0.06	0.12	0.10	0.10
6	0.14	0.12	0.11	0.09	0.09	0.08	0.06	0.12	0.10	0.10
7	0.03	0.03	0.05	0.06	0.06	0.08	0.09	0.28	0.30	0.30
8	0.14	0.12	0.11	0.09	0.09	0.08	0.06	0.12	0.10	0.10
9	0.03	0.03	0.05	0.06	0.06	0.08	0.09	0.03	0.06	0.06
10	0.26	0.03	0.05	0.06	0.06	0.08	0.06	0.03	0.10	0.10
11	0.14	0.12	0.11	0.09	0.09	0.08	0.06	0.12	0.10	0.10
12	0.03	0.03	0.05	0.06	0.06	0.08	0.09	0.03	0.06	0.06
Value “d” of each item	0.10	0.08	0.09	0.07	0.07	0.08	0.07	0.08	0.10	0.10
Value “d” construct	0.11									
Percentage (%) of expert consensus for each item	83%	92%	92%	100%	100%	100%	100%	92%	92%	92%
Percentage (%) of expert consensus for construct	86%									
Defuzzification	0.86	0.88	0.89	0.91	0.91	0.92	0.93	0.88	0.90	0.90
Item ranking in each construct	15	12	9	4	3	2	1	11	5	6
Item content	<p>Can help improve [brand] and its products</p> <p>Increasing the strength of relationships and the brand community</p> <p>Feel more connected to the [brand]</p> <p>Feel more connected to other customers of [brand]</p> <p>Use experience to help other customers</p> <p>Share experience and knowledge with others so as to help them be more educated about [brand]</p> <p>Feel good to help answering member's questions</p> <p>Look forward to discussing opinions about [brand] and its products with other people</p> <p>Enjoy conversing with similar people</p> <p>It is important to have conversations with people who share the same views about [brand]</p>									

The second consequence of *Online Customer Engagement*, namely *Participates in Brand Communities* was captured as significance by the findings (refer Table V(A) and Table V(B)). Examined items were calculated with the value of “d” ≤ 0.2 , proven that all questions are relevant for reaching an agreement 86%. When the selected group of experts evaluates these items, they have confirmed that they are suitable as measuring scales to the studied constructs.

According to the results of defuzzification in both tables, the scores obtained for all items are within the range of 0 to 1

and the alpha-cut values have exceeded 0.5 [52]-[53], [56]. The achievement of these values demonstrates the success of obtaining the experts' consent on each item submitted after the analysis. As mentioned earlier, *Participates in Brand Communities* has adopted the most number of items from literature. Following that, 9 out of 24 questions (leaving 15 items) have been excluded from this construct based on the ranking to minimize and facilitate respondents in answering the questionnaire in the actual survey soon.

TABLE V. (B). VALUE “D” OF ITEM, VALUE “D” OF CONSTRUCT, % OF EXPERTS CONSENSUS, DEFUZZIFICATION AND ITEM RANKING FOR PARTICIPATES IN BRAND COMMUNITIES (Q25 – Q29)

Expert	PARTICIPATES IN BRAND COMMUNITIES				
	Q25	Q26	Q27	Q28	Q29
1	0.03	0.11	0.10	0.11	0.04
2	0.03	0.05	0.06	0.05	0.04
3	0.13	0.05	0.10	0.05	0.13
4	0.03	0.05	0.06	0.05	0.26
5	0.13	0.11	0.10	0.11	0.13
6	0.13	0.11	0.10	0.11	0.13
7	0.27	0.29	0.30	0.29	0.26
8	0.13	0.11	0.10	0.11	0.13
9	0.03	0.05	0.06	0.05	0.04
10	0.27	0.05	0.06	0.05	0.26
11	0.13	0.11	0.10	0.11	0.13
12	0.03	0.05	0.06	0.05	0.13
Value “d” of each item	0.11	0.09	0.10	0.09	0.14
Value “d” construct	0.11				
Percentage (%) of expert consensus for each item	83%	92%	92%	92%	75%
Percentage (%) of expert consensus for construct	86%				
Defuzzification	0.87	0.89	0.90	0.89	0.86
Item ranking in each construct	13	8	7	10	14
Item content	Derives enjoyment from problem solving and idea generation	Community members can use their knowledge to help	Gives an opportunity to receive help from other community members	Able to use the community to find answers about [brand]	Freely share interest in the brand community

After the analysis and modification process, the number of items retained is 29 against 42 original items reviewed in the provided questionnaire by the expert group. Table VI presents the summary of the items investigated after the Fuzzy Delphi analysis by the experts. The findings demonstrate that items obtained and modified from literature has been validated to be tested with the actual sample of brand communities in SNS environment.

TABLE VI. THE MODIFIED NUMBER OF ITEMS AFTER FUZZY DELPHI ANALYSIS

Construct	Number of initial items	Number of items (after analysis)	Labelled of questions
Online Customer Engagement	9 items	9 items	Q1 – Q9
eWOM	9 items	5 items	Q10 – Q14
Participate in Brand Communities	24 items	15 items	Q15 – Q29
Total	42 items	29 items	

V. DISCUSSION AND CONCLUSION

Taking the example of the analysis has been discussed, Fuzzy Delphi method proved very effective to confirm the modified set of items of literature into a different dimension of the study in terms of platform, object and subject of customer engagement. Indeed, it shows that *Increases in eWOM* and *Participates in Brand Communities* is a relevant result of customers engaged in behavioural aspects of the SNS community network. It coincides with the success of previous researcher studies that use Fuzzy Delphi for verification thus determining the priorities of factors or elements on a subject being examined [46]-[47], [56]-[57].

The analyzed items were well-calculated, as evidenced by the average threshold “d” ≤ 0.2 [50]-[51] and the average achievement of specialist consensus for proximal customer engagement variables and both consequences, which exceeded 75% [50]. The defuzzification scores obtained for all items is in the range of 0 to 1 and alpha-cut values have exceeded 0.5 as mentioned by [52] and [53] that confirms items analyzed are acceptable and contribute to the body of knowledge. The

full analysis results conclude that it has met the objective of this study to validate the measurement items for customer engagement and its consequences from the manifestation of their behaviour on the SNS avenue.

The outcome of this study offers two implications via the side of practical and social. First, by knowing the scales of the customer's engagement in the SNS interface such as indicators like, share and comment, digital marketers can establish effective strategies to drive customer or prospect towards promotional activities, campaigns, and brand-run contests. The items agreed by experts to evaluate the increase of customers through eWOM and the active participation in brand communities should be noted by the firms so that their brand can be recognized by the prospect and maintained by existing customers. For example, customers who continuously react to specific product or brand; by liking or sharing tips and uses of a brand are loyal customers that must be preserved by firms because they are valuable assets for brand life sustainability. This situation dictates the concept of relationship marketing that emphasizes those customers who have interacted with and are familiar with the brand become the source of informers to members within the brand's community site. Other theoretical support for customer engagement in brand community activities is derived from social exchange theory, where customers who are satisfied with the quality of their ties from the brand will resonate the sentiment, for example, through sharing of ideas to advance future brand products.

In terms of social implications, SNS software providers can offer a non-charge indicator within a wider radius to firms, capable of capturing the number of active loyal customers who often contribute brand-related information to other customers. This view aligns with the tendency of firms that often use built-in dashboards as they are cheaper and easier to learn on their own [58]-[59]. Programmers and social media administrators are also encouraged to provide similar approaches to these firms. With that, virtual marketers who are mostly small-scale businesses can leverage it to measure the effectiveness of their brand marketing efforts in the community.

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REFERENCES

- [1] J. Wirtz et al., "Managing brands and customer engagement in online brand communities," *Journal of Service Management*, vol. 24, no. 3, pp. 223–244, Jun. 2013.
- [2] F. Kujur and S. Singh, "Engaging customers through online participation in social networking sites," *Asia Pacific Management Review*, vol. 22, no. 1, pp. 16–24, Mar. 2017.
- [3] V. Blazevic et al., "Beyond traditional word-of-mouth," *Journal of Service Management*, vol. 24, no. 3, pp. 294–313, 2013.
- [4] "2016-2018 Research Priorities", *Marketing Science Institute*, 2016. [Online]. Available: <http://www.msi.org/research/2016-2018-research-priorities>. [Accessed: Nov. 07, 2017].
- [5] T. Hennig-Thurau, C. F. Hofacker, and B. Bloching, "Marketing the pinball way: understanding how social media change the generation of

- value for consumers and companies," *Journal of Interactive Marketing*, vol. 27, no. 4, pp.237-241, 2013.
- [6] T. Aichner and F. Jacob, "Measuring the degree of corporate social media use," *International Journal of Market Research*, vol. 57, no. 2, pp. 257–275, 2015.
- [7] J. Gummerus, V. Liljander, E. Weman, and M. Pihlström, "Customer engagement in a Facebook brand community," *Management Research Review*, vol. 35, no. 9, pp. 857–877, Aug. 2012.
- [8] L. Dessart, C. Veloutsou, and A. Morgan-Thomas, "Consumer engagement in online brand communities: a social media perspective," *Journal of Product & Brand Management*, vol. 24, no. 1, pp. 28–42, Mar. 2015.
- [9] C. M. Sashi, "Customer engagement, buyer-seller relationships, and social media." *Management Decision*, vol. 50, no. 2, pp. 253-272, 2012.
- [10] R. J. Brodie et al., "Consumer engagement in a virtual brand community: an exploratory analysis consumer engagement in a virtual brand community: An exploratory analysis," *Journal of Business Research*, vol. 66, no. 1, 2013.
- [11] D. E. Schultz and J. Peltier, "Social media's slippery slope: challenges, opportunities and future research directions," *Journal of Research in Interactive Marketing*, vol. 7, no. 2, pp. 86–99, May 2013.
- [12] J. Van Doorn et al., "Customer engagement behavior: theoretical foundations and research directions." *Journal of Service Research*, vol. 13, no. 3, pp. 253-266, 2010.
- [13] R. C. Gambetti, G. Graffigna, and S. Biraghi, "The Grounded Theory approach to consumer-brand engagement," *International Journal of Market Research*, vol. 54, no. 5, pp. 659-687, 2012.
- [14] L. D. Hollebeek, M. S. Glynn, and R. J. Brodie, "Consumer brand engagement in social media: conceptualization, scale development and validation," *Journal of Interactive Marketing*, vol. 28, no. 2, pp. 149–165, May 2014.
- [15] F. J. Martínez-López, R. Anaya-Sánchez, S. Molinillo, R. Aguilar-Illescas, and I. Esteban-Millat, "Consumer engagement in an online brand community," *Electronic Commerce Research and Applications*, vol. 23, pp. 24–37, 2017.
- [16] R. Thakur and S. P. Jain, "Customer engagement and online reviews," *Journal of Retailing and Consumer Services*, 41, pp.48-59, 2017.
- [17] S. L. Vargo and R. F. Lusch, "Service-dominant logic: continuing the evolution." *Journal of the Academy of Marketing Science*, vol. 36, no. 1, pp. 1-10, 2008.
- [18] M. Clark, H. G. Black, and K. Judson, "Brand community integration and satisfaction with social media sites: a comparative study," *Journal of Research in Interactive Marketing*, vol. 11, no. 1, pp. 39–55, 2017.
- [19] P. M. Blau, *Exchange and Power in Social Life*. Transaction Publishers, 1964.
- [20] S. J. Pervan, L. L. Bove and L. W. Johnson, "Reciprocity as a key stabilizing norm of interpersonal marketing relationships: Scale development and validation." *Industrial Marketing Management*, vol. 38, no. 1, pp. 60-70, 2009.
- [21] A. Dovaliene, A. Masiulyte, and Z. Piligrimiene, "The relations between customer engagement, perceived value and satisfaction: the case of mobile applications," *Procedia-Social and Behavioral Sciences*, vol. 213, pp. 659–664, Dec. 2015.
- [22] T. H. Bijmolt, M. Eisenbeiss, B. G. Hardie, A. Lemmens and P. Saffert, "Analytics for customer engagement." *Journal of Service Research*, vol. 13, no. 3, pp. 341-356, 2010.
- [23] A. Javornik and A. Mandelli, "Behavioral Perspectives of Customer Engagement: An exploratory study of customer engagement with three Swiss FMCG brands," *Journal of Database Marketing & Customer Strategy Management*, vol. 19, no. 4, pp. 300–310, 2012.
- [24] W. Kunz, L. Aksoy, H. Hall, Y. Bart, K. Heinonen, and R. Marketing, "Customer engagement in a big data world," *Journal of Services Marketing*, vol. 31, no. 2, pp. 1–39, 2017.
- [25] M. R. Habibi, M. Laroche, and M.-O. Richard, "The roles of brand community and community engagement in building brand trust on social media," *Computers in Human Behavior*, vol. 37, pp. 152-161, 2014.

- [26] B. J. Baldus, C. Voorhees, and R. Calantone, "Online brand community engagement: Scale development and validation," *Journal of Business Research*, vol. 68, no. 5, pp. 978–985, 2015.
- [27] G. Greve, "ScienceDirect The moderating effect of customer engagement on the brand image – brand loyalty relationship," *Procedia -Social Behavior. Science*, vol. 148, no. 148, pp. 203–210, 2014.
- [28] G. Broekemier, N. N. Chau, and S. Seshadri, "Social Media Practices Among Small Business-to-Business Enterprises," *Small Business Institute® Journal Small Business Institute®*, vol. 11, no. 1, pp. 37–48, 2015.
- [29] S. Hassan, S.Z.A. Nadzim and N. Shiratuddin, "Strategic use of social media for small business based on the AIDA model," *Procedia-Social and Behavioral Sciences*, vol. 172, pp. 262-269, 2015.
- [30] H.M. Taiminen and H. Karjaluo, "The usage of digital marketing channels in SMEs," *Journal of Small Business and Enterprise Development*, vol. 22. no. 4, pp. 633-651, 2015.
- [31] C. K. Prahalad and V. Ramaswamy, "Co-creating unique value with customers," *Strategy & leadership*, vol. 32, no. 3, pp. 4-9, 2004.
- [32] E. Jaakkola and M. Alexander, "The role of customer engagement behavior in value co-creation : a service system perspective," *Journal of Service Research*, vol. 17, no. 3, pp. 247–261, 2014.
- [33] T. Hennig-Thurau, K. P. Gwinner, G. Walsh, and D. D. Gremler, "Electronic word-of-mouth via consumer-opinion platforms: what motivates consumers to articulate themselves on the Internet?," *Journal of Interactive Marketing*, vol. 18, no. 1, pp. 38–52, Jan. 2004.
- [34] J. Brown, A. J. Broderick and N. Lee, "Word of mouth communication within online communities: Conceptualizing the online social network," *Journal of Interactive Marketing*, 21(3), pp.2-20, 2007.
- [35] R. E. Goldsmith and R. A. Clark, "An analysis of factors affecting fashion opinion leadership and fashion opinion seeking," *Journal of Fashion Marketing and Management*, vol. 12, no. 3, pp. 308-322, 2008.
- [36] A. Shoham and A. Ruvio, "Opinion leaders and followers: A replication and extension," *Psychology & Marketing*, vol. 25, no. 3, pp. 280-297, 2008.
- [37] S. Chu and Y. Kim, "Determinants of consumer engagement in Electronic word-of-mouth (eWOM) in Social Networking Sites", *International Journal of Advertising*, vol. 30, no. 1, pp. 47-75, 2011
- [38] A. T. Norman and C. A. Russell, "The pass-along effect: Investigating word-of-mouth effects on online survey procedures," *Journal of Computer-Mediated Communication*, vol. 11, no. 4, pp. 1085-1103, 2006.
- [39] A. M. Muniz and T. C. O'Guinn, "Brand Community," *Journal of Consumer Research*, vol. 27, no. 4, pp. 412–32, 2001.
- [40] V. A. Barger and L. Labrecque, "An integrated marketing communications perspective on social media metrics," *International Journal of Integrated Marketing Communications*, pp. 64-76, 2013.
- [41] C. M. K. Cheung, M. K. O. Lee, and X.-L. Jin, "Customer Engagement in an Online Social Platform: A Conceptual Model and Scale Development," in *Thirty Second International Conference on Information Systems*, 2011.
- [42] S. D. Vivek, S. E. Beatty and R. M. Morgan, "Customer Engagement: Exploring customer relationships beyond purchase," *Journal of Marketing Theory and Practice*, vol. 20, no. 2, pp. 122-146, 2012.
- [43] M. Á. Moliner, D. Monferrer, and M. Estrada, "Consequences of customer engagement and customer self-brand connection," *Journal of Services Marketing*, vol. 32, no. 19, pp. 8357–25, 2018.
- [44] T. Wang, R. K. Yeh, C. Chen and Z. Tsydypov, "What drives electronic word-of-mouth on social networking sites? Perspectives of social capital and self-determination," *Telematics and Informatics*, vol. 33, pp. 1034–1047, 2016.
- [45] S. Gregory, J. F. T. Hartman and J. Krahn, "The Delphi method for graduate research.," *Journal of Information Technology Education: Research*, vol. 6, pp. 1-21, 2007.
- [46] R. Mustapha, Z. Hussin and S. Siraj, "Analisis faktor penyebab ketidakjujuran akademik dalam kalangan mahasiswa: aplikasi teknik Fuzzy Delphi.", *Jurnal Kurikulum & Pengajaran Asia Pasifik*, vol. 2, no. 2, pp. 1-17, 2017.
- [47] N. Mat Noh, S. Abd Razak, N. Alias, S. Siraj, M. Mohd Jamil and Z. Hussin, "Usage of Facebook : the future impact of curriculum implementation on students in Malaysia", *Procedia-Social and Behavioral Sciences*, vol. 103, pp. 1261-1270, 2013.
- [48] M. Adler and E. Ziglio, "Gazing into the oracle: the Delphi Method and its application to social policy and public health." London: Jessica Kingsley Publishers, 1996.
- [49] T. J. Gordon, *The Delphi Method*. Future Research Methodology, 1994.
- [50] P. L. Chang, C. W. Hsu and P. C. Chang, "Fuzzy Delphi Method for evaluating hydrogen production technologies." *International Journal of Hydrogen Energy*. pp. 14172 – 14179, 2011.
- [51] C.H. Cheng and Y. Lin, "Evaluating the best main battle tank using Fuzzy Decision Theory with linguistic criteria evaluation." *European Journal of Operational Research*, vol. 142, no. 1, pp. 174-186, 2002.
- [52] S. Bodjanova, "Median alpha-levels of a Fuzzy Number." *Fuzzy Sets and Systems*. vol. 157, no. 7, pp. 879-891, 2006.
- [53] C. W. Tang and C. T. Wu, "Obtaining a picture of undergraduate education quality: a voice from inside the university." *Higher Education*, vol. 60, pp. 269–286, 2010.
- [54] M. A. Bashir and N. A. Ali, "Impact of customer brand relationship through Facebook on the level of customer engagement," *Pakistan Business Review*, no. April 2016, pp. 159–178, 2016.
- [55] J. Gutiérrez-Cillán, C. Camarero-Izquierdo, and R. San José-Cabezudo, "How brand post content contributes to user's Facebook brand-page engagement. The experiential route of active participation," *BRQ Business Research Quarterly*, vol. 20, no. 4, pp. 258–274, 2017.
- [56] M. Mohd Jamil, S. Siraj, Z. Hussin, N. M. Noh and A. Arifin, *Pengenalan asas kaedah Fuzzy Delphi dalam penyelidikan rekabentuk pembangunan*. Minda Inteltek, Bangi, 2014.
- [57] N. Habibah, A. Ramlie, Z. Hussin and M. Mohd Jamil, "Aplikasi Teknik Fuzzy Delphi Terhadap Keperluan Aspek ' Riadhah Ruhiiyyah ' Untuk Profesionalisme Perguruan Pendidikan Islam." *The Online Journal of Islamic Education*, 2014.
- [58] T. Wiesel, K. Pauwels and J. Arts, "Practice prize paper—Marketing's profit impact: quantifying online and off-line funnel progression." *Marketing Science*, vol. 30, no. 4, pp. 604-611, 2011.
- [59] B. Grosser, "What do metrics want? How quantification prescribes social interaction on Facebook", *Computational Culture*, 2014.