Ways of Identifying the Opinion Leaders in Virtual Communities

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Abstract

Virtual communities are the uppermost communication spaces and channels for online word-of-mouth. And opinion leaders are the most important group for enterprises' word-of-mouth communication. As enterprises are engaged in online word-of-mouth marketing activities, the key is to find out the opinion leaders in virtual communities. In this paper, after affirming the effects of opinion leaders and reviewing and summarizing the former ways of finding out opinion leaders, authors will introduce to us how to use the social network analysis method and the UCINET software, together with traditional observations and investigations, to analyze and identify the opinion leaders in virtual communities by case study.

Keywords: Virtual community, Opinion leader, Social network analysis, UCINET software

In every social field, from the noble to the humble, once people deviate from being alone, they will be under the control of certain leadership at once. ------ Gustave Le Bon, The Crowd: A Study of Popular Mind.

1. Introduction

In May, 2007, Samsung performed the word-of-mouth marketing based on online opinion leaders in virtual communities for the mobile telephone U608. Statistical data of results proved that the marketing was successful. From then on, a discussion to the word-of-mouth marketing in virtual communities is uprising. Although the word-of-mouth marketing in virtual communities is still at an exploring stage, enterprises begin to pay more and more attentions on tracing, analyzing, and guiding word-of-mouth marketing by Internet. Combining Samsung's word-of-mouth marketing based on opinion leaders in virtual communities with our study's purpose, this paper tends to answer the two questions as follow:

(1) What are the main influences (effects) of opinion leaders on individuals' decision in system?

(2) How to identify the opinion leaders in virtual communities?

2. Review of Literature on opinion leaders

2.1 Origin of theory of opinion leaders

In 1944, professor Lazarsfeld, in his researches, has found that the public communication does not directly flow to the mass but be interpreted firstly by opinion leaders and then reach the common people. The process is: the mass medium → the opinion leaders → the common people. That is the so-called "two step flow communication". The main contributions of this theory are: (1) Information can be transferred not only by medium but also by interpersonal communication network. In other words, people can obtain information by two channels or any of the two; (2) There is an interface between the medium and the interpersonal communication network, And the interface is the opinion leader; (3) The influences of opinion leaders and interpersonal communication network on information communication and individuals' decision are far larger than that of the mass medium.

2.2 The connotation of opinion leaders

Lazarsfeld discussed the concept of opinion leader in his book The People's Choice for the first time. After the general election in 1940, he began to notice the effect of interpersonal communication. He found that there was a small part of people who were active in interpersonal communication network, supplying information, opinions, and suggestions for people, exerting personal influences on others, and shouldering an idea-guiding responsibility. Lazarsfeld named them as "opinion leaders". The opinion leader refers to people who provide others with information or suggestions in the interpersonal communication network and at the same time they are activists who can affect others. Kotler (1998) defined "opinion leader" as: people who can influence members in the social community because of special techniques, knowledge, personalities, and other uniqueness.

2.3 The characteristics of opinion leaders

Rogers (1962) put forward three typical characteristics of opinion leaders: (1) high social participation; (2) high

social status; (3) high social responsibility. In Roberston's opinion (1971), what makes opinion leaders differ from common group members are: being more directive, more innovative, and more professional. Thereof, professional knowledge is decisive (Solomon, 1992). According to Childers' researches (1986), high knowledge / experiences, high innovation, and high endurance to risks are three main personal characteristics of opinion leaders. Most studies take specialty knowledge and influences as characteristics of opinion leaders. Considering the connotation of opinion leaders, in contrast with their followers, they have these characteristics in general as follow.

(1) They can obtain information by more channels and have rich life experiences. They are knowledgeable and professional in one specialty. They can contact with innovation agencies frequently. (2) They prefer to take part in formal or informal social activities. They have a wide social relationship and connect with the public closely. (3) They have far-reaching insight, innovative spirit; energetic thoughts and they would like to accept new things.

2.4 The effects of opinion leaders

For individuals, the innovation---decision process has five stages, namely the recognizing and understanding stage, the attitude-forming stage, the valuation and decision stage, the testing and performing stage, and the adoption and execution stage. At the recognizing and understanding stage, people can obtain information by the public medium or interpersonal communication network. But from the attitude-forming stage to the evaluation and decision stage, people are chiefly under the influences of interpersonal relationship. Therefore, the opinion leader plays a key role in the two stages. The effects of opinion leaders in information diffusion are as follow.

(1) The process and interpretation effect. Opinion leaders can provide with constructive information for members in their interpersonal communication network; (2) The diffusion and communication effect. Opinion leaders can serve as communication assistants of innovation agencies, help to understand the need and find out new communication channels; (3) The decision and guidance effect. Opinion leaders are usually the first people who accept innovations. They drive and push the diffusion of innovations; (4) The exterior optimizing effect. According to the externality theory of economics, the behaviors of opinion leaders, such as adopting innovations early, providing with information and suggestions for their followers, helping innovation agencies to communicate new things, show an obvious effect of exterior optimization; (5) The "bridge" effect. Because of the special status and fame, opinion leaders usually possess the central position in their communities. They can connect with many individuals in their communities and can associate with other communities by interpersonal relationship.

3. The measurement of opinion leaders

It is vital for enterprises to identify the opinion leaders exactly and rapidly. Logistically, it is not hard to advance some standards for opinion leaders. However, the problem is that opinion leaders are not fixed people for different products in different system and environment.

3.1 The traditional way of identifying opinion leaders

Rogers mentioned four ways of identifying opinion leaders in his book Diffusion of Innovations: (1) observation; (2) to grade the key roles; (3) social interpersonal relationship measurement; (4) self- identification. These measures are summarized in table 1 as follow.

The observation method is to identify opinion leaders by network structure and behavior traces in the system. For the way of grading key roles, the opinion leaders are appointed in special fields by people who are informed in social system (Butler, 1923). The social interpersonal relationship measurement is to inquire informants whom will they get or ask information or suggestions from in certain special fields (Lazarsfeld, Berelson, and McPhee, 1954). The self-identification is to make informants evaluate their influences and find out the opinion leader (Carlson, 1965).

3.2 The measurement of opinion leaders in virtual communities

To identify opinion leaders in virtual communities, we can adopt the observation method and the investigation method comprehensively. Procedures are as follow: (1) Find out people who are active and have lots of followers for certain topic in a community forum by observation. If can not, come to the second step; (2) Make an online investigation on followers in the topic and ask them whom they take as their opinion leader. For schools' BBS and other virtual communities that are close to these followers, it will be possible and necessary to make an off-line inquiry; (3) Summarize the data and combine them together with the former observation and identify one or several opinion leaders (notice: considering the diversity of topics in virtual communities, opinion leaders are not necessarily only one).

However, if community members are too much, it is hard to find out the opinion leaders only by observation. Under this circumstance, we can find out the key participators firstly and then identify the opinion leader by the social network analysis method and the UCINET software. This paper takes the fitment part of a virtual community with

more than five thousand members as an example to introduce how to find out the opinion leader. The process is as follow:

(1) Online observation. Target twenty participators who are active and have more followers as objects in further analysis.

(2) Construct a relational matrix. Investigate the details of these twenty activists participating in topics and construct a relational matrix (the social network analysis method is usually to arrange participators in a row-and-column matrix, use 0 or 1 to stand for informants' attitude, and form a relational data matrix. In this study, "1" means consultation and "0" no consultation. In the data matrix, the "1" on row 4 column 3 means the activist "04" consults activist "03" in the virtual community).

(3) The centrality analysis. Procedures are as follow: open UCINET 6.0 → click the data distribution table → copy the data in table 3 and paste them to the data table → store the file "consult about real estate fitment" → enter the operation interface → click the Network in the tool bar → Centrality → Degree → open the file "consult about real estate fitment" → OK. Get the data in table 2 (being processed by standardization).

In order to achieve a more direct expression, we can use the drawing tool in UCINET 6.0 to generate a network relation map. Specific operations are: open UCINET 6.0 → click "Draw" in the tool bar → open the drawing tool "NetDraw" → click and open the file → open the "consult about real estate fitment" → OK. The automatically-generated map is in figure 1.

(4) Analyze and identify. In general, the centrality is the degree of activist's connection with others. It is valued by the number of connections. For a small group (here we do not consider the centrality under the circumstance with many small groups), the more the connections are, the higher the possibility of activist possessing centrality is, and the higher the degree of centrality (Jun Liu, 2004; Jiade Luo, 2005, Kilduff, 2007). By comparing the standardized degrees of participators' centralities and referencing the network relation map, we conclude that the "12" has the highest possibility of being the opinion leader (the standardized centrality degree is 57.895), followed by the "10" (the standardized centrality degree is 52.632).

(5) Correlation analysis and check and identification. If the centrality data and the map analysis fail to recognize the opinion leaders, we can make online investigation that aims at finding out who are the opinion leaders in these participators' opinions. Similar to above, we can get the relational data matrix. In order the check the relationship between opinion leaders and followers, we can adopt the UCINET 6.0 software. Operations are as follow: ① input the matrix from the data window and set up the file "personal-accepted opinion leaders in the topic 'consult about real estate fitment'"; ② open "Tools" → Statistics → Matrix (QAP) → QAP Correlation, choose the file "consult about real estate fitment" and the file "personal-accepted opinion leaders in the topic 'consult about real estate fitment'" → OK. The output data is in table 3. We can find out the Pearson coefficient between the "consult about real estate fitment" and the "personal-accepted opinion leaders in the topic 'consult about real estate fitment'" is 0.805. In general, as the Pearson coefficient is higher than 0.6, the more the informant takes the activist as an opinion leader, the more he or she will follow, vice versa. In other words, we can identify that the "12" and "10" are the opinion leaders for the real estate fitment part.

4. Discussions and Implication

By case study, this paper puts forward the way of identifying opinion leaders in virtual communities. In specific, we can use the social network analysis method and the UCINET 6.0 software, together with the traditional ways, to find out the opinion leaders step by step, aiming at the circumstance of network virtual community. Because of the particularities of virtual communities, such as the anonymous communication among participators, and the weak ties mutually, the way of grading key roles and the self-identification method are not right for identifying opinion leaders in virtual communities. One of prominent advantages of word-of-mouth communication in network virtual community is that both disseminators and acceptors of information will leave traces as they start or follow a topic online, which makes it easy to identify opinion leaders by observation. The implementation of the social network analysis method and the UCINET software can simplify the process to a great degree, identifying the opinion leaders in certain part or whole virtual community exactly. Although we do not check the result further, the measuring items and data are believable because they are simple (one or two problems and data concerns merely 0 and 1) and the network analysis accomplished by the UCINET software in this paper does not concern complex scales. Moreover, this paper focuses on the virtual community that does not demand higher requirements for reliability. It is not necessary to consider the exterior effectiveness. And after many tests, the effectiveness and the reliability can be guaranteed basically. Our contribution in the research is bring forward a new way of identify opinion leader combing with traditional measuring in the virtual community.

Once enterprises identify opinion leaders, they can apply (1) empowerment tactic, (2) experience tactic, and (3)

assembled relation tactic to influence these opinion leaders. Just as what was said by Einstein, the generation of a question is more important than the settlement. Virtual communities are the uppermost spaces and channels for network word-of-mouth communication and opinion leaders are the most important group for enterprises' word-of-mouth communication. Therefore, as enterprises are engaged in network word-of-mouth marketing activities, the vital step is to identify the opinion leaders in virtual communities rightly.

References

Bayus, B.L. (1985). Word-of-mouth: the indirect effects of marketing efforts. *Journal of Advertising Research*. No.25. p31-9.

Brooks Jr. & Robert C. (1957). Word of mouth: advertising in selling new products. *Journal of Marketing*. No.22(2). p154-162.

Brown, J. J & Reingen, P. H. (1987). Social ties and word-of-mouth referral behavior. *Journal of Consumer Research*. No.14(3). p350-362.

Childers, Terry. (1986). Assessment of the psychometric properties of an opinion leadership scale. *Journal of Marketing Research.* Vol. XXUI (May). p184-8.

Forum of Owners. http://dl.focus.cn/group/group_forum.php.

Katz,E. & Lazarsfeld, P. F. (1955). Personal Influence: the Part Played by People in the Flow of Mass Communications. Glencoe, Ill: Free Press.

King, Charles W. & John O. Summers. (1970). Overlap of opinion leadership across consumer product categories. *Journal of Marketing Research*. Vol. Vir (February). p43-50.

Lazarsfeld, P. F., Berelson, B. & Gaudet, H. (1944). *The people's choice: how the voter makes up his mind in a presidential campaign*. New York: Duell, Sloan and Pearce.

Li, Dongjin. (2001). *Consumer Behavior*. Beijing: Economic Science Press. August.

Liu, Jun. (2004). *An Introduction to Social Relationship Network*. Beijing: Social Sciences Academic Press. Dec.

Luo, Jiade. (2005). *Teaching Materials for Social Network*. Beijing: Social Sciences Academic Press. Apr.

Martin Kilduff. translated by Wang, Fengbin. (2007). *Social Relationship Network and Organization.* Beijing: China Renmin University Press. Jan.

Philip Kotler. (1998). *Marketing Management (Tenth Edition)*. Published By Prentice Hall, Inc.

Robertson, T. S. (1971). *Innovative Behavior and Communication*. New York: Holt, Rinehart and Winston.

Rogers, E. M. (1962). *Diffusion of Innovations*. New York: Free Press.

Rogers, E. M. (1995). translated by Xin, Xin. (2002). *Diffusion of Innovations*. Beijing: Central Compilation & Translation Press.

Samsung's Experiences in Word-of-Mouth Marketing: Realize Popularization based on Opinion Leaders. http://www.web2list.cn/web2news/web2news_1760.html.

Solomon, M. R. (1992). *Consumer Behavior*. Boston, MA: Allyn & Bacon.

Zhou, Xiaohong. (2002). *Modern Social Psychology (First Edition): Researches on Social Behaviors from a Multi-Dimensional View*.

Table 1. The main ways of identifying opinion leaders.

Category	Description	Measuring Items	Advantage	Disadvantage
(1) observation	Identify by recognizing and recording communication network chain and behavior traces in system.	None	Effective	Right for small system, high requirements for observers
(2) grading key roles	Find out potential key roles by instinct and make further identification by grading.	(1) Who are key roles in the system? (2) Who, in your opinion, is the opinion leader of these key roles?	Save costs and time, direct and convenient	Informant should be familiar with the system structure and individuals to a great degree
(3) social interpersonal relationship measurement	Study whom will individuals ask for information and suggestion as they accept new products / services / ideas.	(1) Who is your leader? (2) Whom will you ask for information or suggestion?	Easy to design; effective, and right for different backgrounds	The investigation should cover amounts of informants. Data is too large to small groups.
(4) self-identification	Every informant values whether he or she is an opinion leader or not by answering a series of questions.	Are you an opinion leader in the system?	Evaluate individuals directly and motivate their later behaviors	Poor exactness and the facts need to be further examined.

Resource: From Rogers. (1994). Translated by Xin, Xin. (2002). Beijing: Central Compilation & Translation Press. No.274. (Being revised)

Table 2. The centrality analysis on participators in topic of consulting about real estate fitment.

	Degree	NrmDegree	Share		Degree	NrmDegree	Share
12 12	11.000	***57.895***	0.125	10 10	10.000	***52.632***	0.114
17 17	8.000	42.105	0.091	1 1	7.000	36.842	0.080
14 14	6.000	31.579	0.068	20 20	6.000	31.579	0.068
3 3	5.000	26.316	0.057	8 8	4.000	21.053	0.045
13 13	4.000	21.053	0.045	15 15	4.000	21.053	0.045
5 5	4.000	21.053	0.045	16 16	3.000	15.789	0.034
9 9	3.000	15.789	0.034	19 19	3.000	15.789	0.034
11 11	2.000	10.526	0.023	7 7	2.000	10.526	0.023
4 4	2.000	10.526	0.023	6 6	2.000	10.526	0.023
2 2	1.000	5.263	0.011	18 18	1.000	5.263	0.011

	Degree	NrmDegree	Share
1 Mean	4.400	23.158	0.050
2 Std Dev	2.764	14.548	0.031
3 Sum	88.000	463.158	1.000
4 Variance	7.640	211.634	0.001
5 SSQ	540.000	14958.449	0.070
6 MCSSQ	152.800	4232.687	0.020
7 Euc Norm	23.238	122.305	0.264
8 Minimum	1.000	5.263	0.011
9 Maximum	11.000	57.895	0.125

Network Centralization = 38.60%

Heterogeneity = 6.97%. Normalized = 2.08%

Actor-by-centrality matrix saved as dataset FreemanDegree

Running time: 00:00:01

Output generated: 10 四月 08 21:21:10

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Table 3. The correlation analysis on the topic "consult about real estate fitment" and the personal- accepted opinion leaders for the topic "consult about real estate fitment".

	Value	Signif	Avg	SD	P(Large)	P(Small)	
NPerm							
1 Pearson Correlation:	***0.805***	0.000	0.000	0.067	0.000	1.000	2500.000
2 Simple Matching:	0.961	0.000	0.801	0.021	0.000	1.000	2500.000
3 Jaccard Coefficient:	0.700	0.000	0.060	0.034	0.000	1.000	2500.000
4 Goodman-Kruskal Gamma:	0.992	0.000	-0.065	0.335	0.000	1.000	2500.000
5 Hamming Distance:	15.000	0.000	75.512	5.238	1.000	0.000	2500.000

	consult	opinon leader
1 Mean	0.121	0.103
2 Std Dev	0.326	0.303
3 Sum	46.000	39.000
4 Variance	0.106	0.092
5 SSQ	46.000	39.000
6 MCSSQ	40.432	34.997
7 Euc Norm	6.782	6.245
8 Minimum	0.000	0.000
9 Maximum	1.000	1.000
10 N of Obs	380.000	380.000

QAP MATRIX CORRELATION

Observed matrix: 1.consult about real estate fitment

Structure matrix: 2. personal- accepted opinion leaders for the topic "consult about real estate fitment".

# of Permutations: 2500

Random seed: 761

Hubert's gamma: 35.000

Bivariate Statistics

Univariate statistics

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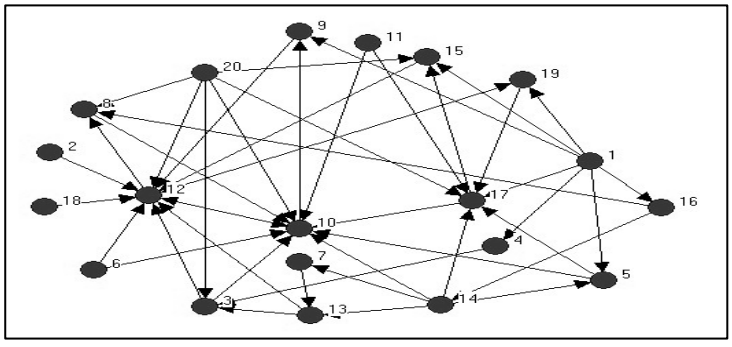

Figure 1. The Network Relation Map of the Topic "Consult about Real Estate Fitment".