

# Using Social Network Theory to Investigate Users' Content Contribution on Social Community

Shing-Ling Wu and Meng-Hsiang Hsu

**Abstract**—As the social community spreads rapidly in recent years, it has become a part of people's daily lives. In addition, people frequently get or share information through the social communities. They will contribute the content by themselves and continue contributing content on social communities when they get good reputations or good feedback. Rarely current research theories contributed for the content contribution. This study was to investigate the content contribution of social community members and combined with motivation of members and social networks (centrality and density and benefit) theory's analysis. Data were collected from 303 members of survey website (mySurvey), Twitter and Facebook in Taiwan. Under the hypothesis verification, results of this study found that: (1) Users' motivation and social networks have a positive impact except for exposure. (2) The social network benefit and social networks have a positive impact. (3) Social network density and benefit have a positive impact on content contribution. Finally, this research based on the above findings, the implications for theory and practice and future research directions are discussed.

**Index Terms**—Social network theory, social network density, social network centrality, social network benefit, content contribution.

## I. INTRODUCTION

With the popularity of the Internet and fast, the transmission of information between people becomes very convenient, so the message needs platform for the network community. People can share their moods and knowledge with each other through interactive media [1] by posting videos, photos, moods, and instant messages through the online community.

In the social community website, the users contribute the content frequently. Users can post other people's posts, add their own experiences to their posts, and others will respond directly to their thoughts and thoughts under the original post. In the study by [2], the success of the social community was determined by the user's contribution. Many of the network community's failures were attributable to the reduction of user contributions, and relatively speaking. The content contribution of the community is very important. Users have different preferences on the SNSs by themselves and each user shares will be distinct. A number of studies and applications of virtual communities have been found in the published literature [3]-[5].

The social community provides a web platform that communicates with others and can successfully attract users

[6]. [7] found that users' trust in the Internet community could increase the sharing of information and that users could have a good word-of-mouth in the sharing of information.

In the online community platform, where you want to be successful, you must have interesting content to get the user. There are also experts surveying the value and benefits of users' participation in the online community [8], [9]. Exposure, revenue sharing, and reputation [10] are the motivations behind the social community's contribution to the content.

In this study, according to [10] relevant papers, further study, the user contribution to the content of the impact of the network from a microscopic point of view. In addition, the social network theory is used to explain the follow-up behavior based on the influence of the user on the motive of use and satisfaction in the individual or group when using the community website.

## II. LITERATURE REVIEW

### A. Uses and Gratifications Theory (UGT)

UGT is the media research theory of communication. UGT is an audience-centered perspective, to understand and use the mass media, and to achieve their own satisfaction. [11] proposed that audiences use the media to satisfy themselves. They originated from the social sciences and studied the audience in the process of communication from the perspective of social satisfaction and psychological needs. The basic concepts are the individual social and psychological Demand, because the demand will produce personal use of the mass media or expectations, thus causing the demand to meet. Use and satisfaction theory, the main purpose is to explain the needs of the user's psychological level in an attempt to create the user's motivation in the use of the media to meet the user's intrinsic motivation [12-13]. According to [11] the assumption of the use and satisfaction theory is that the media user behavior is goal-oriented and active media users and can select the appropriate media to meet their needs. In addition to the social support of social network theory, users can use the "UGT" to infer the behavior of the user.

### B. Social Networking Theory

Social networks represent various relationships in society through which various people or organizations in accidental encounters are linked together [14]. [15] argues that in social organizations, the relationship of social networks is a collection of interconnected relationships between organizations and organizations or between individuals and individuals. [16], [17] view social networks as a set of individual ties or linkages that seek or provide assistance on

behalf of communication or work interactions.[18] According to the theory of social capital, social networks are a part of social capital, and social network members grow rapidly. Therefore, virtual communities enable people to connect and interact with each other [19]. This study will discuss the four parts of support network as mediating variables from the perspective of social network.

Ref. [20] argues that network density is a measure of the degree to which network members interact with each other, that is, the average degree of interaction among members of the community.

Network centrality stands for the position of individual members in the network, meaning that it concentrates on a number of important links to occupy a strategic position [20], [21]. Network centrality is defined as [22-23], in the context of human-to-human interaction.

Ref. [23] points out that the centrality of a network is the degree to which a member of the network is connected to other members and is a structural asset related to power, decision making and innovation. The higher the center of the network, the more access to network resources and knowledge, and easier with other community members have a good social relations.

C. Social Network Benefits

According to the benefits and social networks, and known as the social network benefits Social network efficiency is defined as the user through the Internet in the virtual platform, to obtain tangible or intangible utility and benefits. This study will be in the community website generated benefits, through the implementation of the Internet, and further study the user's follow-up behavior. And according to the above-mentioned literature, the paper summarizes the social network benefits close to the purpose of the study, among which the social network benefit can be divided into income, reputation and social influence. It is defined as follows: Revenue is the share of revenue generated by users in the context of the Internet when a social media site invites a user to write a post on his site's platform [14]. On social media sites such as YouTube, Facebook, Twitter, etc., you can find the content generated by users themselves to attract the attention of other people and advertisers. From the reality of the surface, you can find the contribution of contributors to the content of social media sites is very important, so the site did not dare to neglect the contribution of the contribution of the importance of contributors. And many social media sites will provide users of their ad revenue sharing in order to gain his centripetal force and inspire its continuing contribution to the content in order to achieve a win-win situation. Reputation refers to the reputation and reputation of social evaluations given by website operators or other users in the context of social media when users write articles on a web platform. Some scholars believe that, in terms of social media content contributors, the key and driving factor is reputation [10]. For tens of thousands of data on the Internet, users are often the first choice from well-known contributors [10].

D. Content Contribution

In the current Internet, users can use the network to contribute their talents to social networking sites, and can

quickly gather a variety of important content of the message. In this paper, the contribution of the content of the important concepts, according to [24] will be user content contribution is divided into three ways, used in the Web 2.0 Internet. Web 2.0 is a new platform for the new era of web-based use, where content is generated by user participation, and participant's personalization content is shared among the various participants. Sharing is the formation of the Web 2.0 of the Internet world. There are three ways to contribute content: (1) Participation (2) Sharing and Community (3) Tagging and Folksonomy.

III. RESEARCH QUESTION AND HYPOTHESIS

As above literature review, members of content contribution get or share information for others through social networks communication and social support network in social communities. This study focus on the perspective of social network community to support part of the discussion and referred to social support networks, integrated pattern of social networks of social support provided by the literature can be divided into: emotional, informational, tangible and accompanying support network. The study identified five constructs which build up the conceptual model of this paper are users' motivation, social networks (combined with support, centrality and density), social network benefit and content contribution. We intend to test the direct and indirect relationships of these constructs on content contribution. It is defined as shown in Fig. 1.

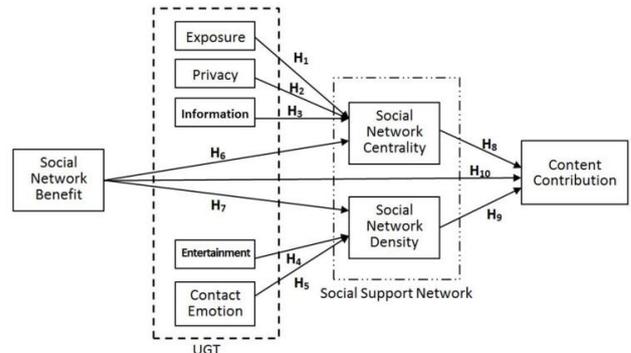


Fig. 1. The research model.

A. User motivation and Social Network Centrality

According to the uses and gratification theory, we propose five motives, with exposure, privacy and information to explore individual motivation in the social community site. And another, through social community interaction behavior, users will share information or contact emotional behavior, and was willing to exchange information by individual intentions [25].

Exposure is the user's to let other members know him through social community, but not for users to get to know other members. As exposure increased by using social media, he felt that privacy was more important. In the era of advanced information technology, individuals will be affected by the privacy policy of the social community website will affect the behavior of individuals. According to the above, the user's motivation is based on the individual. Therefore,

we based on the social network centrality theory. We suggest the following three hypotheses:

- H<sub>1</sub>:** Exposure is positively related to Social network centrality.
- H<sub>2</sub>:** Privacy is positively related to Social network centrality.
- H<sub>3</sub>:** Information is positively related to Social network centrality.

*B. User Motivation and Social Network Density*

According to the uses and gratification theory, we have two motives of entertainment and contact emotion for user degree of interactive relationship between each other in social sites. Now social sites not only share articles, connect with friends, but also play games in the online game. Users can chat online with other users or friends and break through the barrier and share with friends and relatives during the game experience, strategy, cheat, etc. [26] points out that it is helpful to users contact relationships with others on entertainment-oriented interaction between users. In addition, [27] say, the social community site in the process of delivering information is the contact emotion. According to the social network density theory, we suggest the following two hypotheses:

- H<sub>4</sub>:** Entertainment is positively related to Social network density.
- H<sub>5</sub>:** Contact Emotion is positively related to Social network density.

*C. Social Network Benefit and Social network Density and Social Network Centrality*

According to [2] the research results found for users of social networking sites, reputation does not directly affect the user's contributions, but it can promote user's motivation and in social sites or open cooperation platform was very important [2]. Scholars [28] said enterprise or industry in the social community that they can gain increased Revenue. They were established with members of the community on the other hand indirect values such as reputation, influence and recommendations of community members. Thus, we propose two hypotheses:

- H<sub>6</sub>:** Social network benefit is positively related to Social network centrality.
- H<sub>7</sub>:** Social network benefit is positively related to Social network density.

*D. Social Network Density and Social Network Centrality and Social Network Benefit and Content Contribution*

Users interact with each other in social community site and degree of links. Content contribution in assessing the individuals in social community website, is provided on and shares all kinds of data and information. In using community website of process in the, user will for personal of habits, and preferences, also will select and himself by familiar, and trust of people to for information share [29], also using and others of interactive process in the, also will by effect, has scholars pointed out that in groups in the, user through community website common share related file message Shi, is by these message in the get himself of needs and can feel to meet, and on the is in established and maintenance social relationship [30]. However, scholars say successful use of community website enables individuals or enterprises, building a reputation, Word of mouth, and for a successful enterprise,

can reduce costs, increase revenue [15]. According to the social network density theory, we suggest the following three hypotheses:

- H<sub>8</sub>:** Social network centrality is positively related to Content contribution.
- H<sub>9</sub>:** Social network density is positively related to Content contribution.
- H<sub>10</sub>:** Social network benefit is positively related to Content contribution.

IV. METHODOLOGY

An empirical study was conducted to test the relationship between the constructs and a questionnaire was developed for this purpose. This study conducted a survey to collect the data, which is described below.

*A. Instrument Development*

This study has four main aspects: uses and gratification, social network, social network benefit and content contribution. We have nine constructs. Our questionnaire was created by adapting measures had been validated by prior literature, or converting the definition of items developed based on the relevant theory and prior studies into questionnaire format. The research used a five point Likert-scale from 1, strongly disagree to 5, strongly agree, total has 60 problem asked items, the frame surface of development process and variable number of operation type defined points said following.

*B. Data Collection*

TABLE I: DEMOGRAPHICS OF SAMPLES

Demographics		Number of Responses	Percentage of Responses
Sex	male	155	51%
	female	148	49%
Age	<20	35	12%
	20-39	252	83%
	>40	16	5%
Education	High school or below	22	7%
	College and University	192	63%
	Graduate school or above	89	29%
Social Network Sites	Facebook	212	70%
	Line	78	26%
	BBS	4	1%
	Google+	3	1%
	Twitter	3	1%
Member history of SNS's usage	other	3	1%
	Less than 1 year	5	2%
	1 to 2 years	18	6%
	2 to 3 years	34	11%
Average daily number of hours	Over 3 years	246	81%
	Very few	3	1%
	Very little	21	7%
	Less	4	1%
	Average	54	18%
	A little	62	20%
Average daily number of hours	A little more	63	21%
	Many	96	32%

The data was collected through a survey conducted from users of social community sites in Taiwan in May 2014. A total of 303 responses were received. Some of the questionnaires were dropped as they were incomplete. To target the users of Facebook, a banner with a hyperlink connecting to the Web survey was posted on questionnaire-website (mySurvey) and social community sites (Facebook and Twitter). Members with Facebook use experience were invited to support this survey. At the end of

data collection, a total of 303 questionnaires were collected for further data analysis. The demographics of participants are shown in Table I.

V. RESULTS OF ANALYSIS

A. Data Analysis and Hypotheses Test

Partial Least Squares (PLS) was used as the structural equation modeling tool for the analysis. PLS is chosen because PLS has minimum restriction on measurement scales, sample size and residual distribution. PLS also allows researchers to assess measurement and structural model simultaneously, including indirect and direct effects. Following a two-stage methodology recommended by [31], this study assessed reliability and construct validity by conducting conformation factor analysis (CFA) in the first step. Then, the structure model was examined in the second step.

B. Measurement Model

The adequacy of the measurement model was evaluated in terms of reliability, convergent validity, and discriminant validity. Reliability was examined using the composite reliability values. As listed in Table II, all of these values were greater than 0.87, well above the commonly acceptance levels of 0.70 [32]. The results indicate adequately composite reliability.

Convergent validity was evaluated for the measurement scales using two criteria suggested by [33]: (1) all indicator factor loadings should be significant and exceed 0.70, and (2) average variance extracted (AVE) by each construct should exceed the variance due to measurement error for that construct (i.e., should exceed 0.50). As shown in Table III, standardized CFA loadings for all items were significant and exceed the minimum criteria of 0.7. Furthermore, as can be seen in Table IV all AVE values of all constructs are greater over the minimum threshold value of 0.5. As a result, results indicate the adequate convergent validity.

Discriminant validity was evaluated using the criteria recommended by [33] that the square root of the AVE should exceed the correlation shared between the construct and other constructs in the model. Table II lists the correlations among constructs, with the square root of the AVE on the diagonal. The results demonstrate the accepted discriminant validity.

C. Result of Structural Equation Model

The theoretical model and hypothesized relationships were estimated using the bootstrap approach with a sample size of 500 to generate t-values and standard errors for determining the significance of paths in the structural model. Fig. 2 summarized the results of structural model test.

As hypothesized, the results pointed out that Exposure has not significant positive impact to Social network centrality ( $H_1$ :  $t$ -value=1.78,  $p$ >0.05, and path-coefficient of 0.14). Privacy has significant positive impact to Social network centrality ( $H_2$ :  $t$ -value=5.05,  $p$ <0.001, and path-coefficient of 0.23). Information has a significant positive impact to Social network centrality ( $H_3$ :  $t$ -value=2.88,  $p$ <0.001, and path-coefficient is 0.19).

Entertainment has significant positive impact to Social network density ( $H_4$ :  $t$ -value=3.41,  $p$ <0.001, and path-coefficient is 0.26). Contact emotion has significant positive impact to Social network density ( $H_5$ :  $t$ -value=4.13,  $p$ <0.001, and path-coefficient is 0.31).

TABLE II: CR, AVE AND CORRELATIONS OF LATENT VARIABLES

Constructs	Composite Reliability	Cronbach's Alpha	R Square	Discriminate validity	AVE
Exposure (EX)	0.93	0.89	-	0.90	0.81
Privacy (PR)	0.91	0.86	-	0.86	0.78
Information (IN)	0.88	0.80	-	0.84	0.70
Entertainment (EN)	0.95	0.94	-	0.84	0.81
Contact Emotion (CE)	0.93	0.88	-	0.90	0.80
Social Network Benefit (SNB)	0.92	0.88	-	0.73	0.52
Social Network Centrality (SNC)	0.93	0.92	0.36	0.90	0.70
Social Network Density (SND)	0.90	0.88	0.47	0.80	0.63
Content C contribution(CC)	0.94	0.92	0.44	0.87	0.76

TABLE III: THE CONSTRUCTS OF STRUCTURE ANALYSIS

Hypothesis	Constructs Structure Relation	Path coefficient	t value
H <sub>1</sub>	EX → SNC	0.14	1.78
H <sub>2</sub>	PR → SNC	0.23	5.05***
H <sub>3</sub>	IN → SNC	0.19	2.88**
H <sub>4</sub>	EN → SND	0.26	3.41***
H <sub>5</sub>	CE → SND	0.31	4.13***
H <sub>6</sub>	SNB → SNC	0.21	2.88**
H <sub>7</sub>	SNB → SND	0.26	4.13***
H <sub>8</sub>	SNC → CC	0.23	1.87
H <sub>9</sub>	SND → CC	0.28	2.37*
H <sub>10</sub>	SNB → CC	0.27	5.05***

\*p<0.05 ; \*\* p<0.01 ; \*\*\* p<0.001

TABLE IV: HYPOTHESES TEST RESULT

Item	Hypotheses	Result
H <sub>1</sub>	Exposure is positively related to Social network centrality.	Reject
H <sub>2</sub>	Privacy is positively related to Social network centrality.	Accept
H <sub>3</sub>	Information is positively related to Social network centrality.	Accept
H <sub>4</sub>	Entertainment is positively related to Social network density.	Accept
H <sub>5</sub>	Contact Emotion is positively related to Social network density.	Accept
H <sub>6</sub>	Social network benefit is positively related to Social network centrality.	Accept
H <sub>7</sub>	Social network benefit is positively related to Social network density.	Accept
H <sub>8</sub>	Social network centrality is positively related to Content contribution.	Reject
H <sub>9</sub>	Social network density is positively related to Content contribution.	Accept
H <sub>10</sub>	Social network benefit is positively related to Content contribution.	Accept

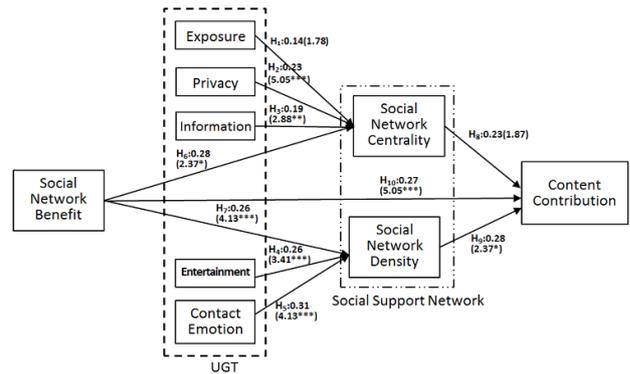


Fig. 2. Results of the research SEM.

Social network benefit has significant positive impact to Social network centrality ( $H_6$ :  $t$ -value=2.88,  $p$ <0.001, and path-coefficient is 0.21). Social network benefit has significant positive impact to Social network density ( $H_7$ :  $t$ -value=4.13,  $p$ <0.001, and path-coefficient is 0.26).

Social network centrality has not significant positive impact to Content contribution ( $H_8$ :  $t$ -value=1.87,  $p$ >0.05, and path-coefficient is 0.23). Social network density has significant positive impact to Content contribution ( $H_9$ :  $t$ -value=2.37,  $p$ <0.05, and path-coefficient is 0.28). Social

network benefit has significant positive impact to Content contribution ( $H_{10}$ :  $t$ -value=5.05,  $p < 0.001$ , and path-coefficient is 0.27).

Based on the statistical analysis and path-coefficient and  $t$  values were significant, the hypothesis has been supported by this study, all detailed results summary follow below. PLS analysis results put in Table II, Table III. This study presents the analysis of frame structure model, verified results of Table IV.

## VI. CONCLUSION AND LIMITATION

With the rapid development of the Internet, social community website has become a part of the daily life of many users. People use information technology or the final purpose of the social community, we hope that technology can bring better living environment, improve the quality of life and promote communication. This study explores social networking information sharing as a blueprint, through the social network theory to analyze the impact of user motivation on the content contribution, such research results, can make the community website developers a better understanding of the needs of users, the other proposed community website developers, users can benefit for further reward mechanism, So the contribution of the practice can also show the importance of this study.

According to [9], the benefits of cognitive learning and social integration evolve over time as a result of social relationships, with benefits as a sense of belonging or personal identity. In other words, the behavioral elements of the environment in which the individual participates in the community, as in status, reputation or prestige in the group. In addition, [34] proposed the social network; the structure is connected by nodes through the way to illustrate the relationship between people. Therefore, this paper combines the benefits of the network with the social network, and uses the connection relations generated by the social network to illustrate the user benefits in the community website, which is called the social network benefit.

Few scholars apply the benefits of the web to the content contributions that people make on the web. In addition, scholars have explored content contributions for network benefits. From a macro point of view, we can understand the motivations of users in social networking sites. The social network theory is not mentioned; the user is affected by individual factors or group factors, and then contributes to the content, the other in accordance with past use and satisfaction of the theory of relevant literature to understand the users in the use of community websites. The motive of satisfying, and to discuss these motives in detail.

This research examines a deeper layer of social networking and explores how social networking benefits can influence content contributions. They lead us to the idea that people can turn self-needs into words, voice, video, so that the participants in the community to get information and feedback or to meet people's needs, this phenomenon in the academic discussion is worthy of attention.

While the results of this study provide several interesting findings, it is necessary to recognize its limitations. This

research in Taiwan, we use variety social community and it is most often using of user for research object. First, the questionnaires test on mySurvey, Twitter and Facebook and participants test almost are young students that subjects may limit the generalizability of the findings to other types of Virtual Communities in other countries. Further study is needed to examine the extent to which the findings of this study can be applicable in various types of social communities in different countries. Second, this study only focuses on Facebook users and not taking into account other virtual community platform that this research is limit. Finally, this research maybe need to expand more constructs. The future research can analysis and discussion of the other factors that can also identify the respective construct model of high and low. It can make this research more complete.

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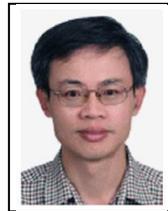
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