

## An Analysis of User Attitudes to SNS

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### Abstract

Social Networking Service (SNS) have become widely used in Japan in recent years with Facebook, mixi and Twitter being the most popular. These are used in various fields of life together with the convenient devices such as smart-phones. A questionnaire investigation was used to clarify the current usage condition, issues and desired function etc. Information for marketing purposes was then extracted. Fundamental Statistical Analysis, Multi Corresponding Analysis, Quantitative Analysis and Text Mining Analysis were then performed. Reviewing past research, there are some related papers, but they do not include new tools which are evolving rapidly. Moreover there has been little research conducted on this precise topic. Some interesting results were obtained.

**Keywords:** SNS, questionnaire investigation, Multivariate Analysis, Text Mining

### 1. Introduction

Social Networking Service (SNS) become widely used in Japan in recent years with Facebook, mixi and Twitter are the popular one. Big Disaster happened at 11/March/2011 in the east part of Japan. It is well known that Facebook played important role in communication under the condition that telephone and/or cellular phone connected with Internet could not make link. Google launched forth into SNS by the name Google+ at June 2011. Thus, it has become a hot business spot and it makes great influence upon society and economy.

In this paper, we make questionnaire investigation in order to clarify the current usage condition, issues, and desired functions etc. Marketing applications would then, be extracted. Reviewing past researches, Miyao et al. (2008) made questionnaire investigation concerning usage objective of SNS and its usage consciousness. They analyzed into 4 clusters by cluster analysis but it does not include Facebook and Google+, which are increasing among users recently. Yamamoto et al. (2011) made research on the intimacy among friends on SNS but it does not mention about sharing information. Thus, there are researches concerning SNS, but there has been few researches made on our above stated themes.

The rest of the paper is organized as follows. Current condition of SNS is stated in section 2. Investigating Former Researches is stated in section 3. Outline of questionnaire research is stated in section 4. Multivariate Analysis such as Multi Correspondence Analysis and Quantitative Analysis is executed in section 5. Text Mining Analysis is executed in section 6, 7. Section 8 is a summary.

### 2. Current Condition of SNS

SNS means the services to construct social network on the Internet. Friendster which has started in the year 2002 is said to be the father of SNS (Saito, 2010). Various typed SNS were born ever since. Japanese users have reached 42.89 million at the end of December 2011. It is reported that 45.1% of Internet users (95.1 million) use SNS. SNS users will increase as is shown in Figure 1.

From the Nielsen data, major SNS's usage condition is as follows (Table 1, 2, Figure 2). Visitors to Facebook are 16.92 million people, which are the largest, and then Twitter: 12.78, mixi: 4.92, Google+: 3.86 follow. Nearly 30% domestic Internet users in Japan use Facebook. As for the average visiting time, mixi is the most for 125 minutes and heavy users often use this media. Twitter has achieved 120% compared with the former month's usage. This may be because it is used in such real time events as the election of The House of Representative. Various field of usage would prevail hereafter.

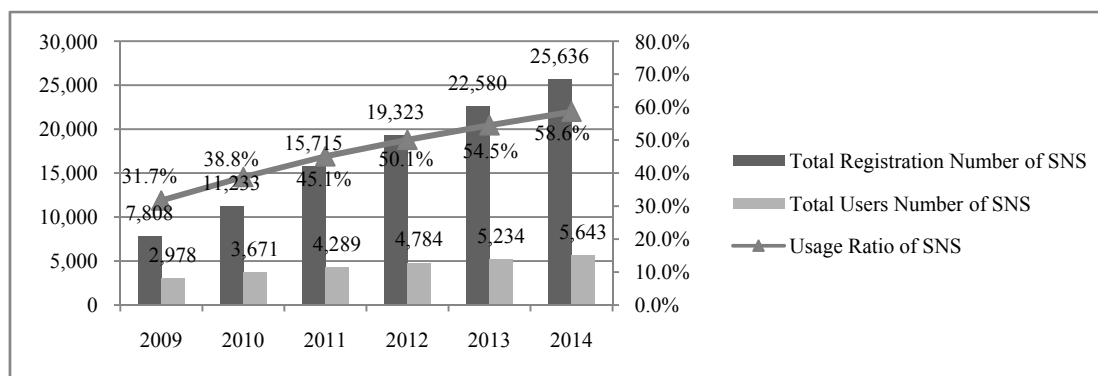


Figure 1. Users number of SNS in Japan

Source: ICT.Reserch &amp; Consulting Inc.

Table 1. Audience data for Dec/2012 mixi, Twitter, Facebook, Google+ by PC net

	User (×1000)	Ratio to the former month	Reach Ratio	Total using time (million minutes)	Ratio to the former month	Average using time (minutes)	Ratio to the former month
mixi	4,916	97.8%	8.1%	617	102.1%	125	104%
Twitter	12,776	100.5%	21.1%	562	120.6%	44	120%
Facebook	16,918	99.9%	28.0%	1,328	102.2%	78	102%
Google+	3,861	98.6%	6.4%	25	86.3%	6	88%

Source: Nielsen.

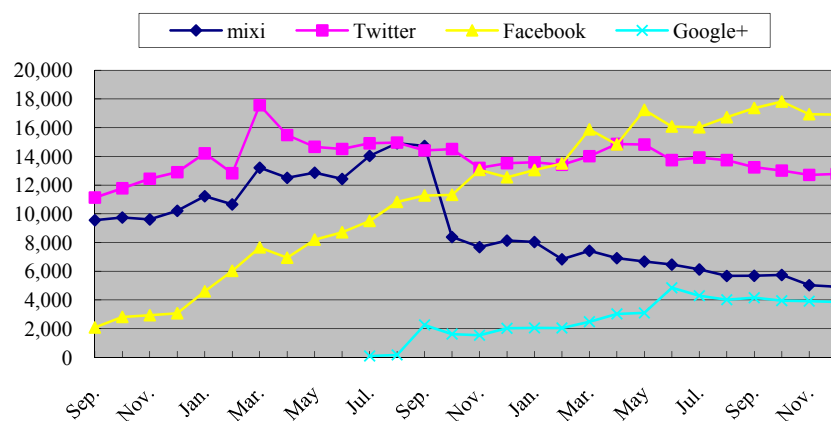


Figure 2. Time series of visitors by PC for Sep/2010~Dec/2012 (×1000)

Source: Nielsen.

Table 2. Time series of visitors by PC for Sep/2010~Dec/2012 (×1000)

	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.
mixi	9,557	9,744	9,608	10,214	11,228	10,659	13,211	12,507	12,864	12,433
Twitter	11,129	11,778	12,444	12,901	14,211	12,824	17,571	15,489	14,666	14,516
Facebook	2,080	2,819	2,934	3,077	4,598	6,030	7,659	6,939	8,204	8,717
Google+	—	—	—	—	—	—	—	—	—	—
	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
mixi	14,033	14,917	14,723	8,385	7,684	8,135	8,037	6,839	7,428	6,914
Twitter	14,914	14,962	14,416	14,551	13,199	13,529	13,593	13,419	14,017	14,866
Facebook	9,504	10,827	11,274	11,319	13,061	12,543	13,049	13,508	14,877	14,831
Google+	91	166	2,257	1,622	1,541	2,038	2,051	2,045	2,480	3,028
	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.		
mixi	6,682	6,463	6,127	5,671	5,686	5,745	5,028	4,916		
Twitter	14,824	13,741	13,920	13,741	13,243	13,011	12,710	12,776		
Facebook	17,241	16,083	16,027	16,730	17,369	17,821	16,937	16,918		
Google+	3,099	4,852	4,295	4,019	4,159	3,949	3,916	3,861		

### 3. Investigating Former Researches

#### 3.1 Positioning in SNS

There are some related papers concerning SNS. Thomson Robert et al. (2012) made a study of 131 Japanese SNS users who use both Facebook and mixi. In that research, self-disclosure, numbers of contacts, in-group numbers, and levels of perceived commitment on mixi and Facebook were measured. The study found that such users showed a lower level of self-disclosure, connected with fewer people and had fewer categories of contacts, and felt a higher degree of commitment on mixi than on Facebook. It may have found the characteristics of the correlation and distinction among tools, but it lacks the viewpoints of organizational management theory. In this paper, focusing the past researches of Harada (2008), a new approach is executed based upon organizational management theory. Such research is quite a new one.

Harada arranged four business models as Figure 3.

The horizontal line shows the users' communication motive and the vertical line shows the solution to be captured. Former one is represented as "Construction of relation" vs. "Self-expression" and the latter one as "Realization of dialogue" vs. "Self-assertion".

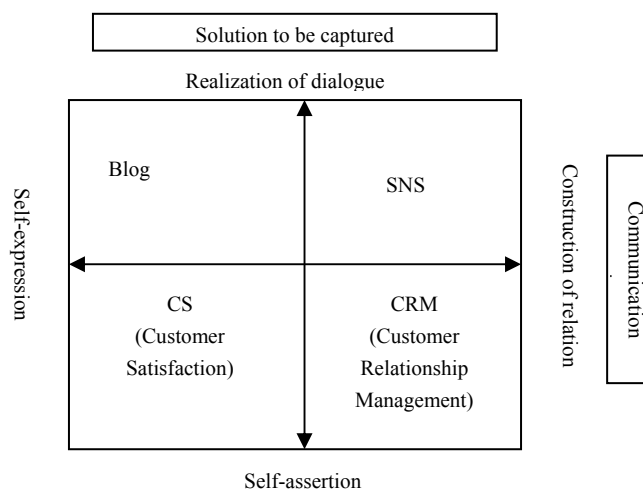


Figure 3. Positioning of SNS

Source: Harada Tamotsu/ Formation of Tribes by Cooperative Experiences- Revised by the writer.

#### 3.2 SNS Users' Desire

Harada pointed out that SNS users want to have relation so as to satisfy following three desire.

- Desire for having relationship:

Desire for having relationship by making communication with friends in having mail and/ or agreement behavior.

The expected role in using SNS is to build good relationship with friends and keep it long. Furthermore, it is used to keep contact with those who are busy or stay in the distance.

- Desire for sharing sympathy:

Desire for sharing sympathy by enjoying hobbies with friends.

As for the second role, it is to talk with friends for about hobby freely. By attending the same hobby group, they seek to share the sympathy.

- Desire for making expression:

Desire for making expression as actor/ actress and being fascinated.

As for the third role, it is to confirm his own value through the evaluation executed by other people. By letting others know himself and by expressing his skill, SNS can be utilized as a "Theater".

#### 3.3 Social Background for the Prevailing SNS

In Marketing 3.0 by P. Kotler (2010), consumers can gather information speedily by utilizing IT. He says that

“cooperative marketing” utilizing SNS becomes an important keyword. Comparison of Marketing 1.0, 2.0 and 3.0 is shown in Table 3.

Table 3. Comparison of marketing 1.0, 2.0, and 3.0

	Marketing 1.0 1980-1989	Marketing 2.0 1990-2005	Marketing 3.0 2006-
	Product-centric Marketing	Consumer-oriented Marketing	Values-driven Marketing
Objective	Sell products	Satisfy and retain the consumers	Make the world a better place
Enabling forces	Industrial Revolution	Information technology	New wave technology
How companies see the market	Mass buyers with physical needs	Smarter consumer with mind and heart	Whole human with mind, heart, and spirit
Key marketing concept	Product development	Differentiation	Values
Company marketing guidelines	Product specification	Corporate and product positioning	Corporate mission, vision, and values
Value propositions	Functional	Functional and emotional	Functional, emotional, and spiritual
Interaction with consumers	One-to-many transaction	One-to-one relationship	Many-to-many collaboration

Source: P. Kotler/Marketing 3.0.

#### 4. Outline of the Questionnaire Research and Examinees

##### 4.1 Outline of the Questionnaire Research

We make a questionnaire investigation concerning the SNS. The outline of questionnaire research is as follows.

- 1) Scope of investigation: Student, Government Employee and Company Employee etc., Japan
- 2) Period: April/26/2012~June/6/2012
- 3) Method: Mail, online and self-writing
- 4) Collection: Number of distribution 1,500, Number of collection 1,197 (collection rate 79.8%), Valid answer 1,098

Major single variable summary results of questionnaire investigation are as follows.

Table 4. Major single variable summary results

Question	Answer	Number of Answer	Share
Q1. Use the SNS	Use	792	72.1%
	Do not use	306	27.9%
Q13. Gender	Male	650	59.2%
	Female	448	40.8%
Q14. Age	—20	196	17.9%
	—30	328	29.9%
	—40	299	27.2%
	—50	194	17.7%
	—60	73	6.6%
	60—	8	0.7%
Q15. Occupation	Student	295	26.9%
	Government Employee	15	1.4%
	Company Employee	595	54.2%
	School Teacher/Staff	43	3.9%
	Clerk of Organization	19	1.7%
	Independents	45	4.1%
	Temporary Employee	15	1.4%
	Part-timers	53	4.8%
	Miscellaneous	18	1.6%
Q16. Residence	Hokkaido	22	2.0%
	Tohoku Region	49	4.5%
	Kanto Region	157	14.3%
	Chubu Region	176	16%
	Kansai Region	400	36.4%
	Chugoku Region	110	10.0%
	Shikoku Region	105	9.6%
	Kyushu Region	79	7.2%

#### 4.2 Analysis Methods

Reviewing past researches, Miyao et al. (2008) made questionnaire investigation concerning usage objective of SNS and its usage consciousness. They analyzed into 4 clusters by cluster analysis but it does not include Facebook and Google+, which are increasing among users recently. Yamamoto et al. (2011) made research on the intimacy among friends on SNS but it does not mention about sharing information.

Questionnaire results are analyzed in five methods as is shown in Table 5. First, summary by single variable is executed in order to examine the pattern of responding about items. Second, analysis by Multi Corresponding Analysis is executed in order to visualize the relationship among the items. Third, analysis by Factor Analysis is executed in order to clarify the viewpoints of important factors. Fourth, Quantification Method II is executed in order to grasp the contribution to the usage of SNS. At the end, Text mining is executed in order to visualize the total structure among questions systematically.

Table 5. The systematic approach on efficient analysis

Step	Aim of analysis	Used Method
1	Examining the pattern of responding about Items	Single Variable Analysis
2	Examine the relationship among questionnaire items about important factors	Multi Correspondence Analysis : (Positioning)
3	Clarifying the viewpoints and axes for the important factors	Factor Analysis: (Extracting)
4	Grasp the contribution to the usage of SNS	Quantification Method II : (Contribution)
5	Visualize the Total structure among questions systematically	Key Graph and Text Analytics for Surveys : (Text Mining)

#### 4.3 Outline of Examinees

##### 4.3.1 Average Utilization Frequency of the SNS (Q2)

From Figure 4, we can observe that 78% people use the SNS every day.

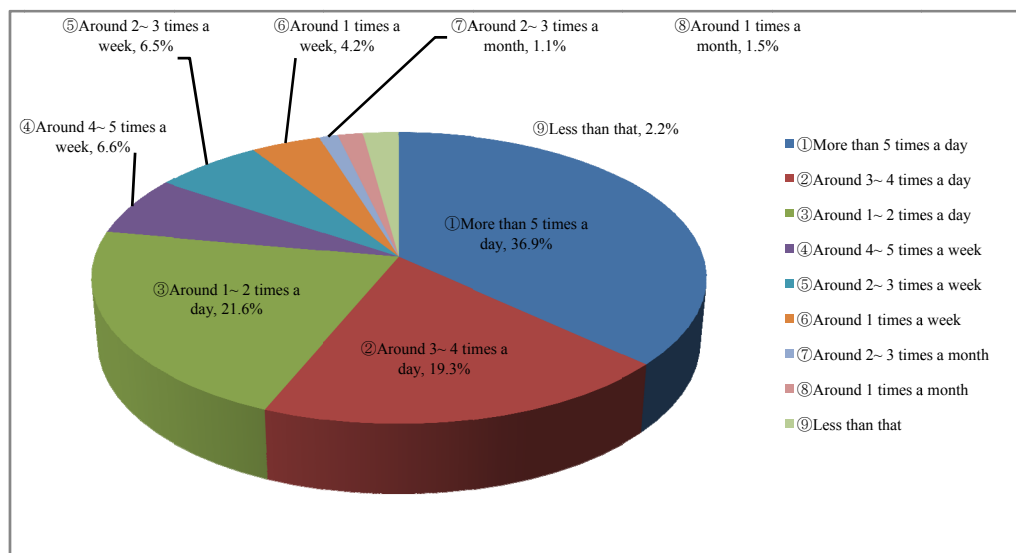


Figure 4. Average usage frequency of the SNS (Q2)

##### 4.3.2 Usage Condition of the SNS (Q3, Q4, Q9)

We show the usage condition of the SNS concerning following questions in Figure 5.

Q3. What kind of the SNS do you use?

Q4. What kind of the SNS do you use the most?

Q9. What kind of the SNS are you going to continue to use?

The usage of Facebook, mixi and Twitter, which are the genre of Integrated SNS, are frequently used and You Tube (one of the moving picture SNS) is the same.

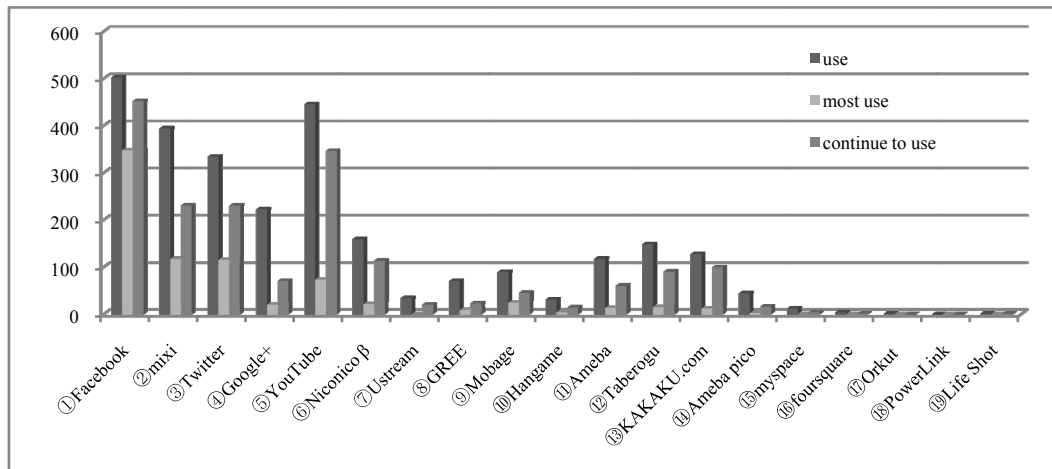


Figure 5. Usage condition of the SNS (Q3, Q4, Q9)

#### 4.3.3 Reason to Use the SNS (Q5)

Biggest reason is “①Able to communicate with friends and acquaintances”, then “⑨Able to collect/ put out hobby and interesting information”, “⑩Able to post diary, tweets, moving images and photos” follow.

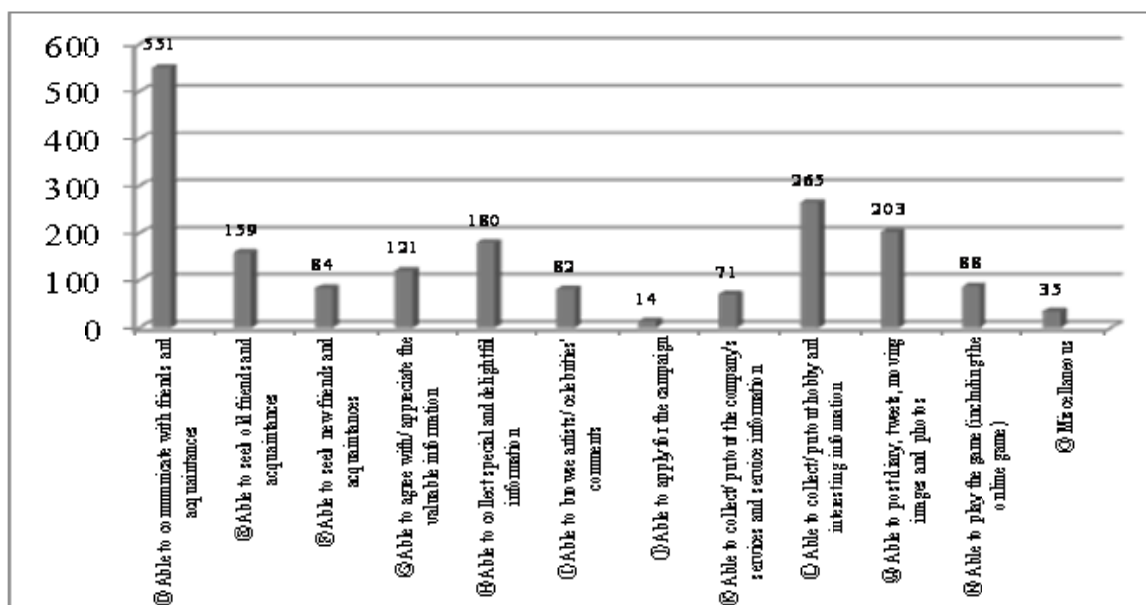


Figure 6. Reason to use the SNS (Q5)

#### 4.3.4 Interesting and Fascinating Points When Using the SNS (Q6)

From Figure 7, we can observe that “①Able to communicate with each other by diary and tweets” is the most and then “⑫Good for killing time”, “②Obtained much opportunities to contact with friends and acquaintances who were under rare contact” and “⑤Able to collect news and information efficiently” follow.

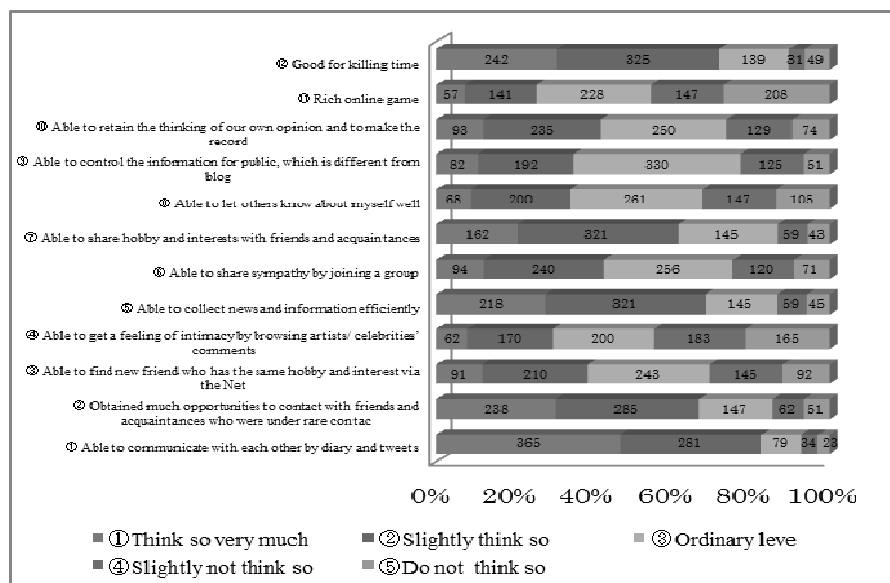


Figure 7. Interesting and fascinating points when using the SNS (Q6)

#### 4.3.5 The Reason for Coming to Use the SNS (Q7)

Biggest reason is “⑨Suggestion by the friends and acquaintances”, then “③To collect information”, “⑩Acquaintances and friends use them” follow.

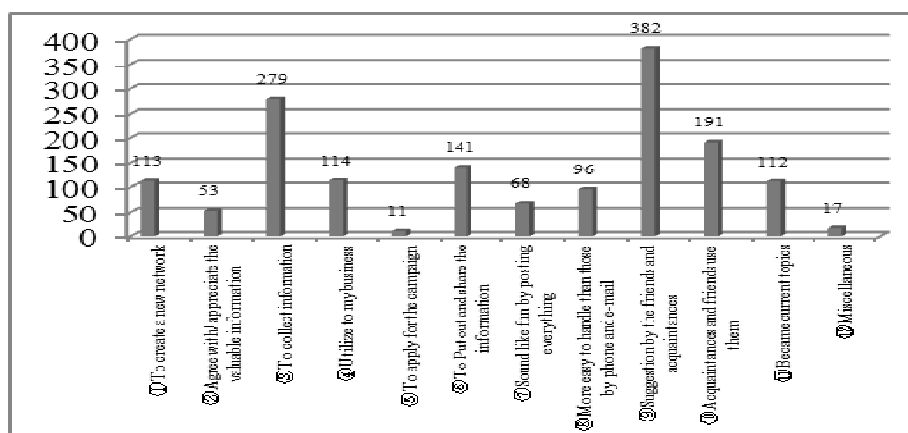


Figure 8. The reason for coming to use the SNS (Q7)

#### 4.3.6 Average Utilization Frequency Reply to the Comments or Share Photos and News (Q8)

From Figure 9, we can observe that 32% people reply to the comments or share photos and news every time and frequency.

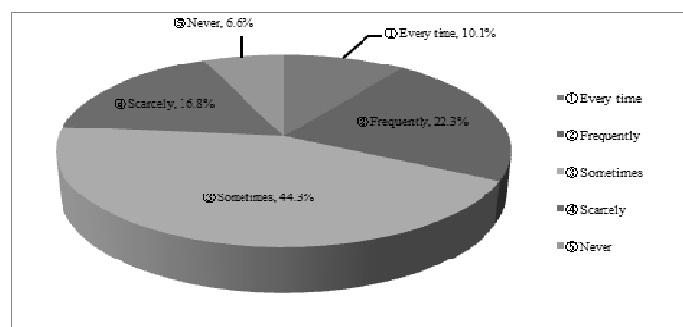


Figure 9. Average utilization frequency reply to the comments or share photos and news (Q8)

#### 4.3.7 The Reason for Continuing to Use the SNS in the Future (Q10)

Biggest reason is “①Want to enrich communication with friends and acquaintances”, then “⑨Want to collect/put out hobby and interesting information”, “⑤Want to collect beneficial and delightful information” follow.

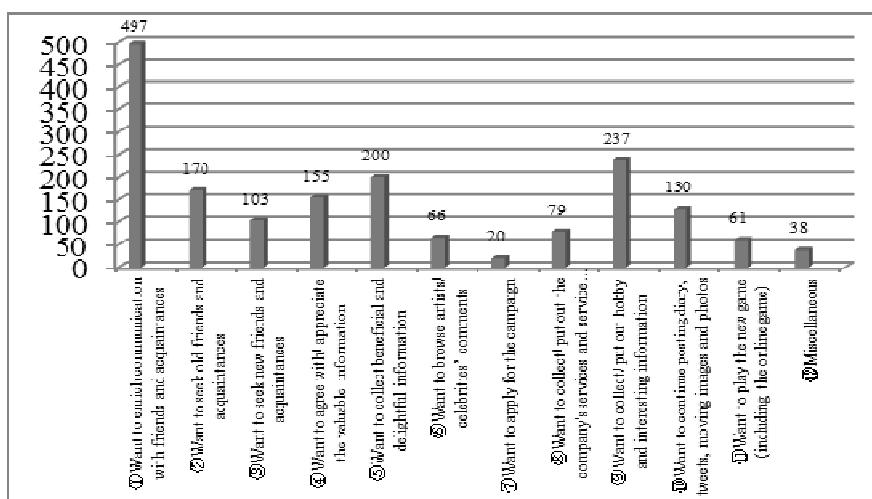


Figure 10. The reason for continuing to use the SNS in the future (Q10)

#### 4.3.8 Important Points When Not Using the SNS (Q11)

From Figure 11, we can observe that “⑨Cannot continue because it is too bothering” is the most and then “③Anxious about security concerning individual information”, “⑩Likely to increase the spam e-mail” and “①Do not have interest” follow. Those who do not use SNS recognize that they do not have Internet because they feel anxiety how to use.

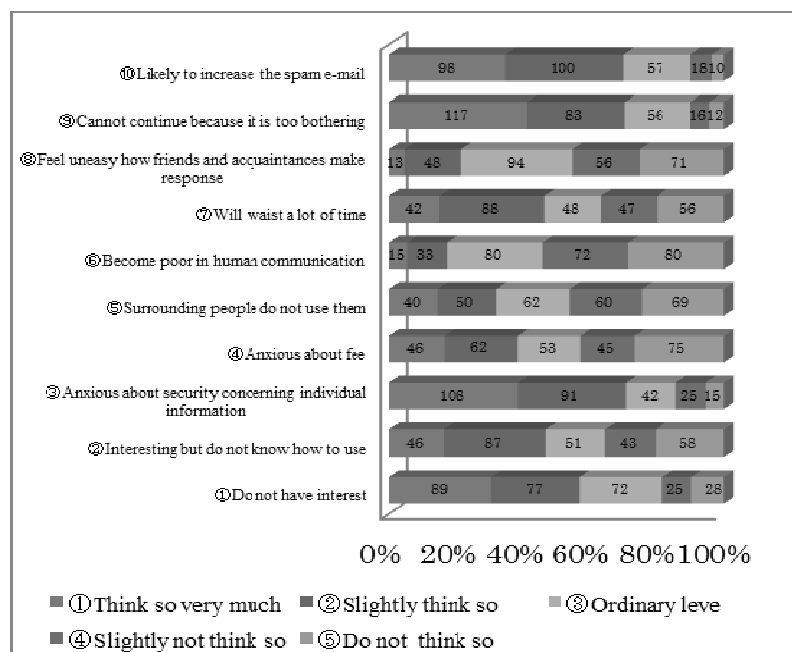


Figure 11. Important points when not using the SNS (Q11)

#### 4.3.9 Expectation to the SNS in the Future (Q12)

From Figure 12, we can observe that “⑨To make perfect the security of individual information” is the most and then “⑩Easiness in using OREasy to use”, “⑤Enrich the collection of information” and “①Make full communication with friends and acquaintances” follow. Both users and non-users want to resolve the security anxiety at first. They also want to have easiness of handling. SNS which meet these requests will develop.



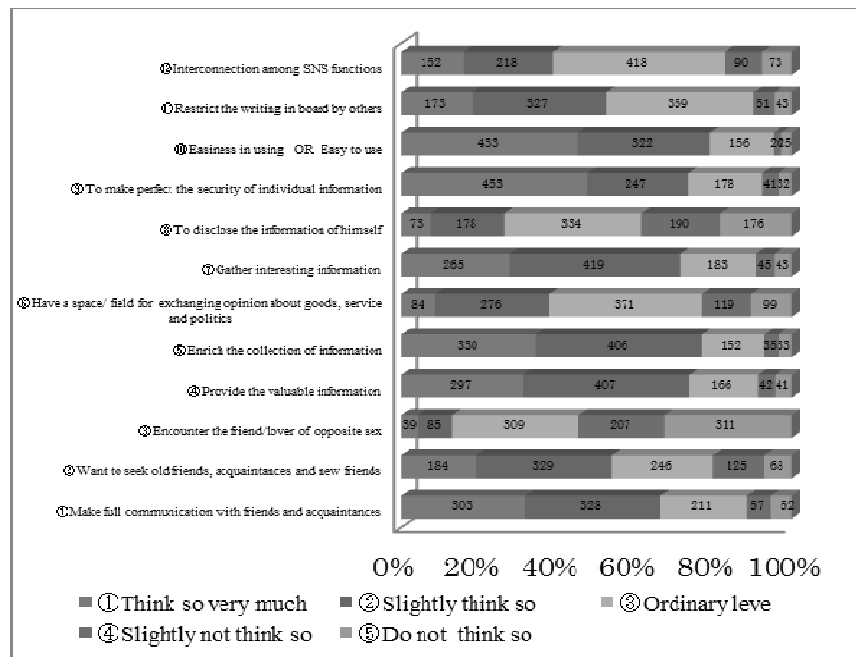


Figure 12. Expectation to the SNS in the future (Q12)

## 5. Multivariate Analysis

### 5.1 Multi Correspondence Analysis

#### 5.1.1 Execution of Analysis

We execute the multi correspondence analysis in Q6 (What are the SNS's interesting and fascinating points?), Q11 (Why don't you use the SNS?), Q12 (What do you expect the SNS in the future?) (Fig 13, 14, 15) in order to find the correlation of each items.

#### 1) What are the SNS's interesting and fascinating points? (Q6)

We can observe the following result from Figure 13. From the data, we can confirm that Dimension 1 axis can be interpreted as "Sympathy" and Dimension 2 as "Society". An eigenvalue of Dimension 1 axis is 0.348 and those of Dimension 2 is 0.273. 62.1% can be explained by these two major axes. We can extract two clusters. We can assume that the first cluster shows "relationship, confirmation and function" (②Obtained much opportunities to contact with friends and acquaintances who were under rare contact), ⑤(Able to collect news and information efficiently), ⑪(Rich online game)). The second one would mean "Sympathy and Participation" (③(Able to find new friend who has the same hobby and interest via the Net), ⑥(Able to share sympathy by joining a group)).

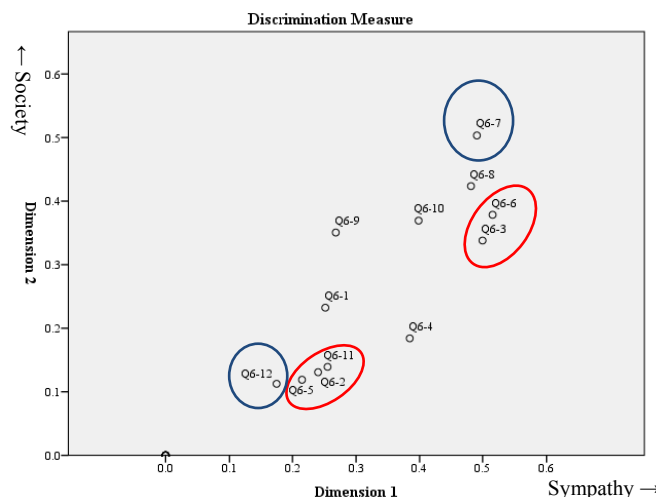


Figure 13. What are the SNS's interesting and fascinating points? (Q6)

## 2) Why don't you use the SNS? (Q11)

We can observe the following result from Figure 14. From the data, we can confirm that Dimension 1 axis can be interpreted as “Relationship” and Dimension 2 as “Indifference” and eigenvalue of Dimension 1 axis is 0.388 and those of Dimension 2 is 0.305. 69.3% can be explained. We can extract four clusters. We can assume that the first cluster shows “Safety, anxiety about operation” (③(Anxious about security concerning individual information), ⑨(Cannot continue because it is too bothering)). The second one would mean “Indifference” (①(Do not have interest), ②(Interesting but do not know how to use)). The third one “Anxious about fee” (④(Anxious about fee), ⑩(Likely to increase the spam e-mail)). The fourth one “Anxiety for human relationship” (⑥(Become poor in human communication), ⑦(Will waist a lot of time)).

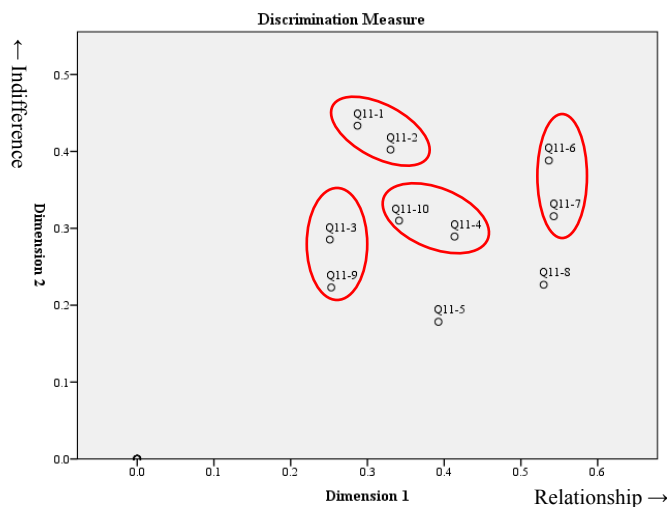


Figure 14. Why don't you use the SNS? (Q11)

## 3) What do you expect the SNS in the future? (Q12)

We can observe the following result from Figure 15. From the data, we can confirm that Dimension 1 axis can be interpreted as “Function” and Dimension 2 as “Information”. An eigenvalue of Dimension 1 axis is 0.471 and those of dimension 2 is 0.301. 77.2% can be explained by these two major axes. We can extract three clusters. We can assume that the first cluster shows “relationship, participation and function” (①(Make full communication with friends and acquaintances), ②(Want to seek old friends, acquaintances and new friends), ⑥(Have a space/ field for exchanging opinion about goods, service and politics), ⑫(Interconnection among SNS functions)). The second cluster would mean “Sharing • Diffusion and Function” (⑦(Gather interesting information), ⑩(Easiness in using)). The third one “Sympathy and Confirmation” (④(Provide the valuable information), ⑤(Enrich the collection of information)).

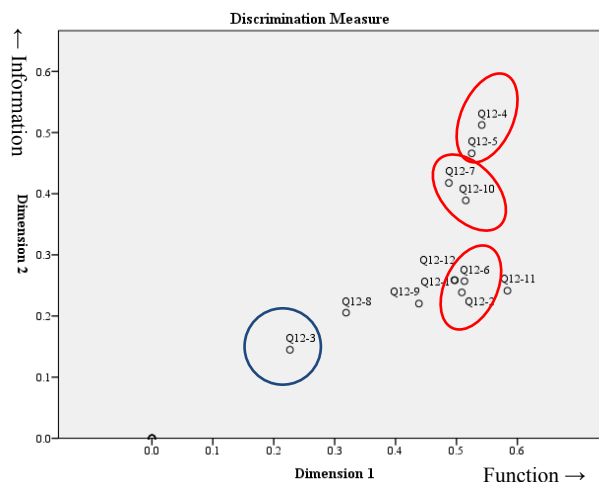


Figure 15. What do you expect the SNS in the future? (Q12)

#### 4) Difference between users and non-users in Q12

We analyze Q12 by diving users and non-users. First of all, we see the users' case. From the data shown in Figure 16, ④(Provide the valuable information) has the largest score. This means that sharing information is valuable for them. Dimension 1 axis can be interpreted as "Sympathy" and Dimension 2 as "Society". This is the same with Figure 13. An eigenvalue of Dimension 1 axis is 0.327 and those of Dimension 2 is 0.265. 59.2% can be explained. We can extract three clusters. The first cluster shows "Relationship and Function" (①(Make full communication with friends and acquaintances), ⑪(Restrict the writing in board by others), ⑫(Interconnection among SNS functions)). The second cluster would mean "Confirmation and Sharing • Diffusion" (⑤(Enrich the collection of information), ⑦(Gather interesting information)). The third one "Expression and Function" (⑧(To disclose the information of himself/herself), ⑨(To make perfect the security of individual information)). This is the one we could not find in Figure 15. Users want to share information or express themselves under the strengthened security system.

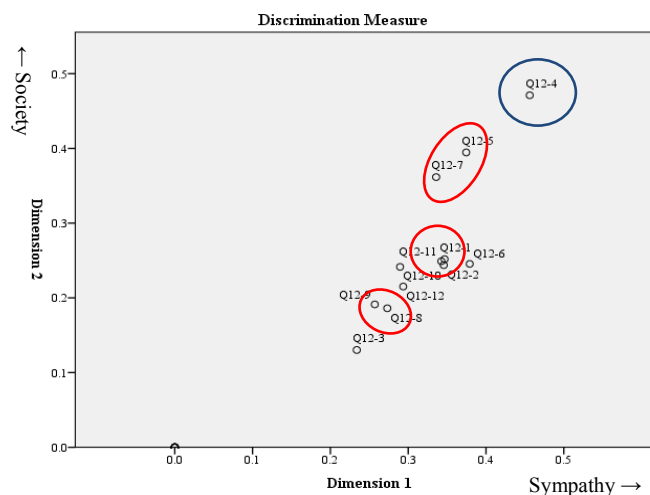


Figure 16. Users' expecting items for SNS in the future (Q12)

Now we see non-users' case (Fig 17). Dimension 1 axis can be interpreted as "Function" and Dimension 2 as "Relationship". ⑧(To disclose information of himself/herself) is located in the small value part, which shows their attitude toward SNS. An eigenvalue of Dimension 1 axis is 0.482 and those of Dimension 2 is 0.267. 74.8% can be explained. We can extract three clusters. The first cluster shows "Participation and Function" (⑥(Have a space/ field for exchanging opinion about goods, service and politics), ⑫(Interconnection among SNS functions)). The second cluster would mean "Relationship and Sharing • Diffusion" (①(Make full communication with friends and acquaintances), ⑦(Gather interesting information)). The third one "Function" (⑩(Easiness in using), ⑪(Restrict the writing in board by others)).

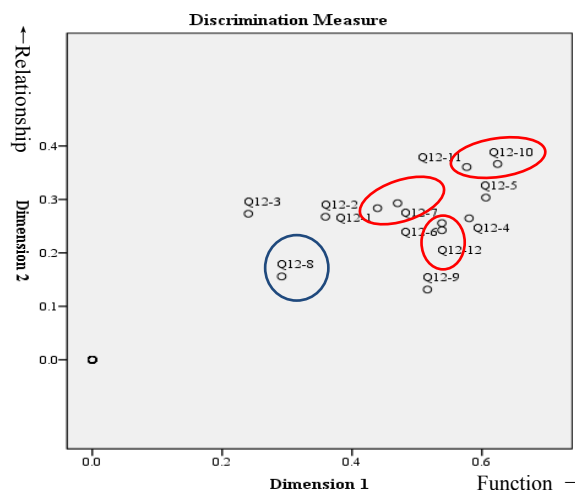


Figure 17. Non-users' expecting items for SNS in the future (Q12)

### 5.1.2 Remarks for Multi Correspondence Analysis

“Confirmation” of Q6⑤(Able to collect news and information efficiently), Q12⑤(Enrich the collection of information) and “Expression” of Q6⑧(Able to let others know about myself well), Q12⑧(To disclose the information of himself/herself) are located in the distant way and they have few relationship, which can be seen Figure 13 and Figure 14. Common theme is to share sympathy in society, which can be observed in Figure 13 and Figure 16. As for non-users, minus item can be seen in Q11 (Why don't you use the SNS?) owing to the indifference. But the Figure 17 shows that the non-users have demands for relationship, attendance, Share & Spread. Therefore they have a probability to shift to users if anxiety items are resolved.

## 5.2 The Analysis by the Factor Analysis

### 5.2.1 Execution of Analysis

Factor Analysis is executed so as to extract viewpoints or axes for the appraisal concerning Q6 (What are the SNS's interesting and fascinating points?), Q11 (Why don't you use the SNS?) and Q12 (What do you expect the SNS in the future?). As for the extraction method of the factor, “the principal axis factoring” is adopted, and as for the rolling-method, “the varimax rotation which is accompanied by the normalization of kaiser as orthogonal rotation” is adopted. Also, we confirmed the validity of the model in the KMO (Kaiser-Meyer-Olkin) specimen validity measure. When the value is more than 0.8, it is said meritorious, more than 0.7 middling, more than 0.6, mediocre. Bartlett sphericity test is executed as well. If the score is less than 0.05, then it is said that there is a correlation among observation variables.

#### 1) What are the SNS's interesting and fascinating points? (Q6)

Table 6. What are the SNS's interesting and fascinating points? (Q6)(factor matrix after rotation)

Q6: What are the SNS's interesting and fascinating points?	Factor		
	1	2	3
①Able to communicate with each other by diary and tweets	.134	.733	-.003
②Obtained much opportunities to contact with friends and acquaintances who were under rare contact	.042	.617	-.047
③Able to find new friend who has the same hobby and interest via the Net	.611	.082	.174
④Able to get a feeling of intimacy by browsing artists/ celebrities' comments	.341	.048	.466
⑤Able to collect news and information efficiently	.291	-.068	.170
⑥Able to share sympathy by joining a group	.641	.173	.133
⑦Able to share hobby and interests with friends and acquaintances	.680	.318	.037
⑧Able to let others know about myself well	.539	.412	.151
⑨Able to control the information for public, which is different from blog	.256	.329	.184
⑩Able to retain the thinking of our own opinion and to make the record	.359	.320	.286
⑪Rich online game	.140	-.041	.703
⑫Good for killing time	.063	.058	.460

KMO measure is 0.798 and Bartlett Score is 0.000. We can confirm a rather appropriate common factor. From the Factor Matrix after rotation, we can extract 3 meaningful axes. We can see that the first axis is the factor about “Sympathy”, “Participation” and “Share & Spread” as the score for ③(Able to find new friend who has the same hobby and interest via the Net), ⑥(Able to share sympathy by joining a group) and ⑦(Able to share hobby and interests with friends and acquaintances) is high. Second axis is the factor about “Relationship” as the score for ①(Able to communicate with each other by diary and tweets) and ②(Obtained much opportunities to contact with friends and acquaintances who were under rare contact) is high, Third axis is the factor about “Function” as the score for ⑪(Rich online game) is high.

## 2) Why don't you use the SNS? (Q11)

Table 7. Why don't you use the SNS? (Q11) (factor matrix after rotation)

Q11. Why don't you use the SNS?	Factor		
	1	2	3
①Do not have interest	.116	-.103	.464
②Interesting but do not know how to use	.434	.145	.022
③Anxious about security concerning individual information	.405	.188	.155
④Anxious about fee	.814	.108	.000
⑤Surrounding people do not use them	.429	.143	.110
⑥Become poor in human communication	.380	.421	.164
⑦Will waist a lot of time	.205	.715	.018
⑧Feel uneasy how friends and acquaintances make response	.201	.714	-.079
⑨Cannot continue because it is too bothering	-.022	.084	.839
⑩Likely to increase the spam e-mail	.385	.211	.423

KMO measure is 0.690 and Bartlett sore is 0.000. We can confirm an ordinary common factor. From the Factor Matrix after rotation, we can extract 3 meaningful axes. We can see that the first axis is the factor about “Anxiety for communication tool” (④(Anxious about fee)). Second axis is the factor about “Fatigue in soul and anxiety for human relationship” (⑦(Will waist a lot of time), ⑧(Feel uneasy how friends and acquaintances make response)). Third axis is the factor about “Anxiety for operation” (⑨(Cannot continue because it is too bothering)).

## 3) What do you expect the SNS in the future? (Q12)

Table 8. What do you expect the SNS in the future? (Q12) (factor matrix after rotation)

Q12. What do you expect the SNS in the future?	Factor			
	1	2	3	4
①Make full communication with friends and acquaintances	.124	.224	.742	.184
②Want to seek old friends, acquaintances and new friends	.073	.160	.733	.309
③Encounter the friend/lover of opposite sex	.025	-.025	.190	.498
④Provide the valuable information	.799	.219	.125	.148
⑤Enrich the collection of information	.865	.158	.092	.109
⑥Have a space/ field for exchanging opinion about goods, service and politics	.304	.213	.037	.609
⑦Gather interesting information	.601	.227	.047	.238
⑧To disclose the information of himself/herself	.157	.118	.184	.539
⑨To make perfect the security of individual information	.196	.568	.062	-.013
⑩Easiness in using	.250	.596	.285	.005
⑪Restrict the writing in board by others	.106	.643	.100	.210
⑫Interconnection among SNS functions	.103	.436	.135	.347

KMO measure is 0.814 and Bartlett score is 0.000. We can confirm an appropriate common factor. From the Factor Matrix after rotation, we can extract 4 meaningful axes. We can see that the first axis is the factor about “Sympathy”, “Identify” and “Share & Spread” (④(Provide the valuable information), ⑤(Enrich the collection of information), ⑦(Gather interesting information)). Second axis is the factor about “Function” (⑩(Easiness in using), ⑪(Restrict the writing in board by others)). Third axis is the factor about “Relationship” (①(Make full communication with friends and acquaintances), ②(Want to seek old friends, acquaintances and new friends)). Forth axis is the factor about “Participation” (⑥(Have a space/ field for exchanging opinion about goods, service and politics)).

## 4) Difference between users and non-users in Q12

Table 9. Users' expecting items for SNS in the future (factor matrix after rotation)

Q12. What do you expect the SNS in the future?	Factor			
	1	2	3	4
①Make full communication with friends and acquaintances	.045	.242	.692	.150
②Want to seek old friends, acquaintances and new friends	.065	.086	.785	.285
③Encounter the friend/lover of opposite sex	.013	-.048	.184	.458
④Provide the valuable information	.778	.222	.086	.141
⑤Enrich the collection of information	.875	.076	.060	.101
⑥Have a space/ field for exchanging opinion about goods, service and politics	.261	.209	-.001	.582
⑦Gather interesting information	.576	.220	.009	.163
⑧To disclose the information of himself/herself	.123	.092	.160	.523
⑨To make perfect the security of individual information	.132	.516	.027	.029
⑩Easiness in using	.164	.490	.204	-.034
⑪Restrict the writing in board by others	.094	.612	.071	.146
⑫Interconnection among SNS functions	.090	.355	.118	.301

KMO measure is 0.758 and Bartlett score is 0.000 in Table 11. We can confirm a rather appropriate common factor. From the Factor Matrix after rotation, we can extract 4 meaningful axes. We can see that the first axis is the factor about "Sympathy" and "Identify" (④(Provide the valuable information), ⑤(Enrich the collection of information)). Second axis is the factor about "Function" (⑪(Restrict the writing in board by others)). Third axis is the factor about "Relationship" (①(Make full communication with friends and acquaintances), ②(Want to seek old friends, acquaintances and new friends)). Fourth axis is the factor about "Participation" (⑥(Have a space/ field for exchanging opinion about goods, service and politics)).

Table 10. Non-users' expecting items for SNS in the future (factor matrix after rotation)

Q12. What do you expect the SNS in the future?	Factor	
	1	2
①Make full communication with friends and acquaintances	-.046	.290
②Want to seek old friends, acquaintances and new friends	-.077	.267
③Encounter the friend/lover of opposite sex	-.123	.317
④Provide the valuable information	.146	.014
⑤Enrich the collection of information	.190	-.040
⑥Have a space/ field for exchanging opinion about goods, service and politics	.034	.169
⑦Gather interesting information	.110	.035
⑧To disclose the information of himself/herself	-.019	.147
⑨To make perfect the security of individual information	.313	-.194
⑩Easiness in using	.218	-.007
⑪Restrict the writing in board by others	.163	-.024
⑫Interconnection among SNS functions	.105	.040

In Table 10, KMO measure is 0.885 and Bartlett score is 0.000. We can confirm an appropriate common factor. First axis would mean "Function" (⑨(To make perfect the security of individual information)). Second axis would mean "Anxiety for relationship" (②(Want to seek old friends, acquaintances and new friends)).

## 5.2.2 Remarks for Factor Analysis

Factors for Q6 (What are the SNS's interesting and fascinating points?) and Q12 (What do you expect the SNS in the future?) are arranged in Table 11.

Table 11. Factors for Q6 (What are the SNS's interesting and fascinating points?) and Q12 (What do you expect the SNS in the future?)

Q6: What are the SNS's interesting and fascinating points?			Q12: What do you expect the SNS in the future?			
1	2	3	1	2	3	4
Sympathy			Sympathy			
Participation	Relationship	Function	Identify	Function	Relationship	Participation
Share & Spread			Share & Spread			

As is shown in Table 11, we can confirm the combination of common factors between Q6 and Q12. One is "Relationship" and another one is "Function". "Participation" which is the first factor in Q6 is replaced into "Identify" in Q12. This implies that after confirming the profile of friend and goods, they proceed to the "Participation" stage. Thus, effective approach is considered by these combinations in demand and action.

### 5.3 The Analysis by the Quantification Method II

#### 5.3.1 Execution of Analysis

Quantification Method II is executed in order to grasp the contribution to the usage of SNS. Outer criteria is set "Use or do not use SNS". Explanation variables are set for each question number of Q12. The discriminate hitting ratio is 66.9%. It is rather good in this case. Utilizing the result of coefficient of canonical discrimination function, discrimination equation of outer criteria can be stated as follows.

$$\begin{aligned}
 Z = & -1.344 + 0.596 Q1201 - 0.038 Q1202 - 0.181 Q1203 + 0.304 Q1204 + 0.172 Q1205 \\
 & - 0.128 Q1206 - 0.089 Q1207 + 0.169 Q1208 - 0.243 Q1209 + 0.525 Q1210 - 0.170 Q1211 \\
 & - 0.232 Q1212
 \end{aligned}$$

Where question number is added to Q12\*\*, for example, Q1209 means that question number is 9 in Q12.

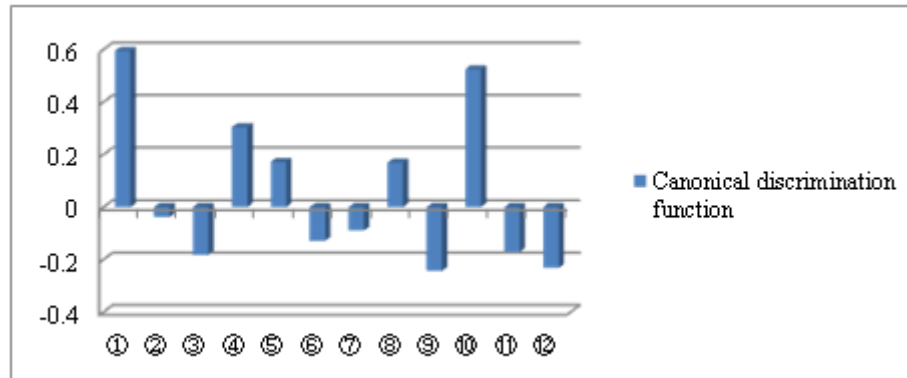


Figure 18. Influence of demand item for SNS

#### 5.3.2 Remarks for Quantification Method II Analysis

From Figure 18, we can observe that big contribution is achieved by the following items. First, ①(Make full communication with friends and acquaintances). Second, ⑩(Easiness in using). Third, ④(Provide the valuable information). Fourth, ⑨(To make perfect the security of individual information). Fifth, ⑫(Interconnection among SNS functions). From these, we can see that "Relationship", "Function", "Sympathy", "Identify" and "Expression" are important factors in utilizing SNS. "Relationship", "Sympathy" and "Expression", which are listed in the former study, are all included.

### 6. Analysis Using Key Graph

Key Graph Method is to clarify the data structure by using key words. Data occurrences at the same period of time are exhibited by the link of Key Graph.

#### 1) Used SNS and their using frequency (Q2-Q3)

The Key Graph Analysis is executed by utilizing Q2 (How often do you use the SNS?) and Q3 (What kind of the

SNS do you use?). The occurrence rate and co-occurrence rate are important measures. From Figure 19, we can see that “More than 5 times a day” has the high co-occurrence rate with “Facebook”, “mixi”, “Twitter”, “You Tube” and “Niconico  $\beta$ ”, while “Around 3-4 times a day” with “Facebook”, “mixi” and “You Tube”, furthermore “Around 1-2 times a day” with “Facebook”, “Twitter” and “You Tube”. Among them, Integrated Genre and Moving Picture Genre were used well.

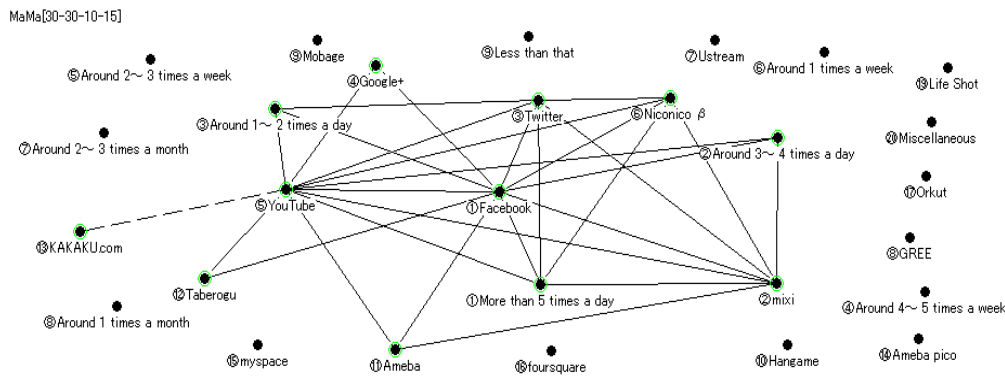


Figure 19. Used SNS and their using frequency

## 2) Attributes and Mostly Using SNS and Its Reason (Q13-14-15-16, Q4-5)

Q4 (What kind of the SNS do you use the most?), Q5 (Why is it?), Q13 (Gender), Q14 (Age), Q15 (Occupation) and Q16 (Address) are analyzed altogether. From Figure 20, we can see that one big cluster is formed. “Male”, “Female”, “-30”, “-40”, “Company employee” and “Kansai” have the high co-concurrency rate. As for SNS site, “Facebook” and its selecting reason “Relationship”, “Share & Spread” factors are extracted.

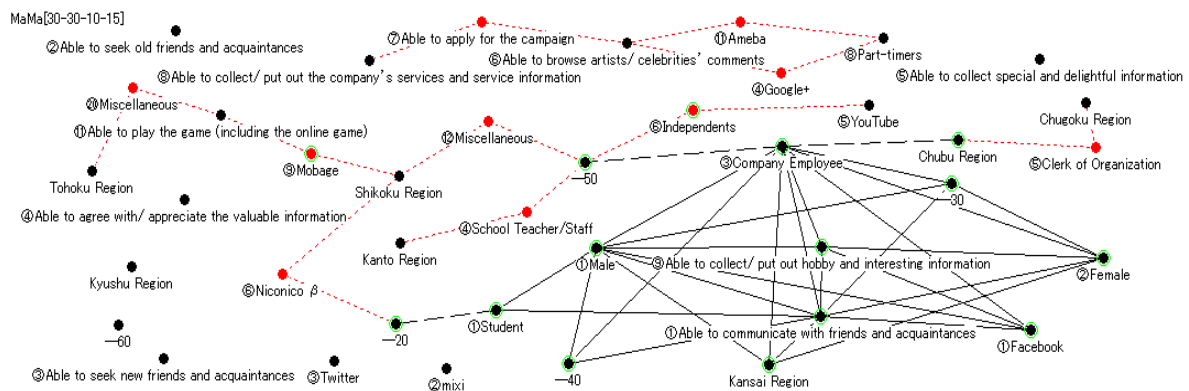


Figure 20. Attributes and mostly using SNS and its reason

## 3) Attributes and the Reason for Commencement of SNS (Q13-14-15, Q3, Q7)

Q3 (What kind of the SNS do you use?), Q7 (How did you come to use the SNS?), Q13 (Gender), Q14 (Age) and Q15 (Occupation) are analyzed altogether. From Figure 21, we can observe that two clusters are formed. For the first cluster, “Male”, “Female”, “-20”, “-30”, “-40”, “Student” and “Company employee” have the high co-occurrence rate.

They use “Facebook”, “mixi”, “Twitter” and “You Tube” with the commencement reason “Identify” factor. Integrated genre and Moving Picture Genre have the similar commencement reason. For the second cluster, “-60” and “Part-timers” have the high co-occurrence rate. They use “Ameba” and “Ameba pico”. Housewives mainly use them as a diary. “-60” has the high co-occurrence rate with “-50”, “School teacher/staff” and “Independents”. They use “Niconico  $\beta$ ” and “Ustream” with the commencement reason, “Utilize in Business” and “To apply for the campaign”.



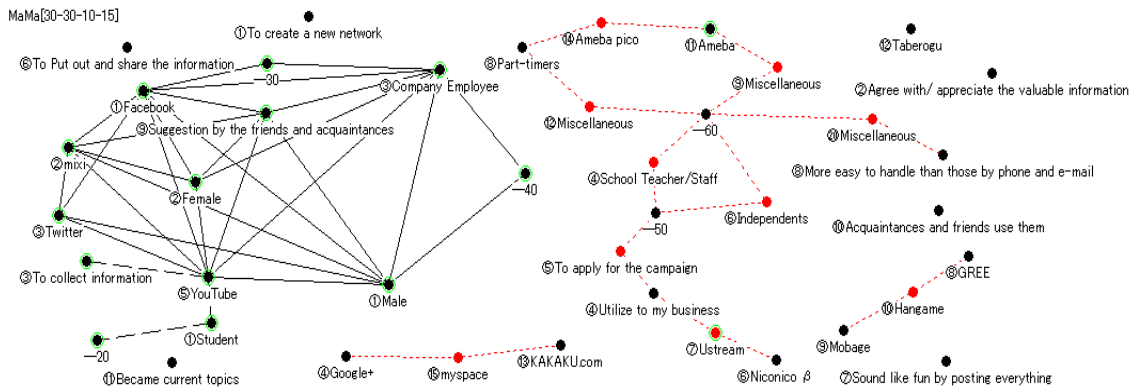


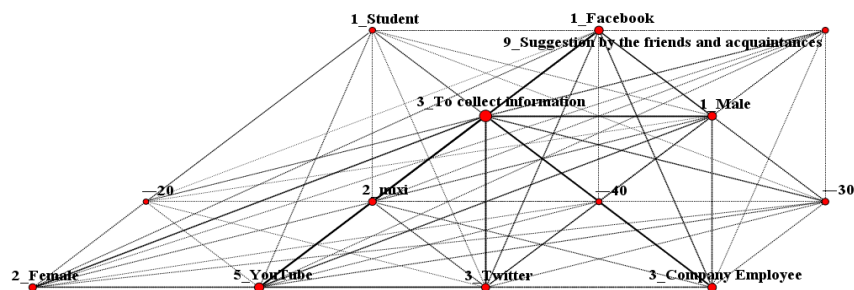
Figure 21. Attributes and the reason for commencement of SNS

### 7. Analysis by “Text Analytics for Surveys”

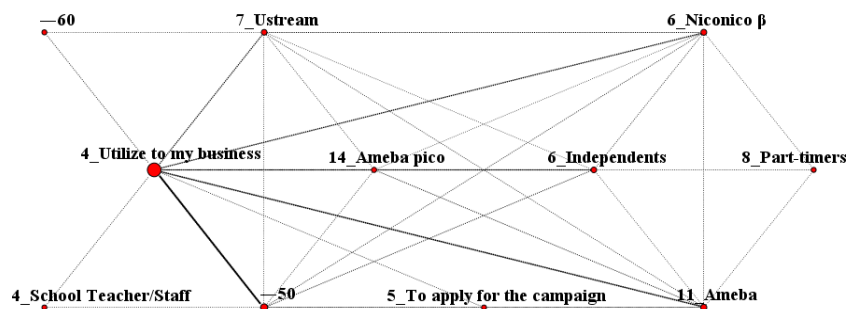
We can extract keywords which have high co-occurrence rate by utilizing the Key Graph Analysis Method. The co-occurrence condition is exhibited by Key Graph and we can classify the data by the Key Graph Clusters. Now, we make analysis utilizing “Text Analytics for Surveys” by focusing important keywords found in Key Graph.

Two clusters, which is analyzed in 6.3) Attributes and the Reason for Commencement of SNS (Q13-14-15, Q3, Q7), are analyzed as follows.

In Figure 22, we make focus on “Confirmation” Factor for the 1<sup>st</sup> cluster, which is in the question item “To collect information”. We can confirm from this Figure that keyword which has strong correlation with “To collect information” is “Male”, “-40” and “Company employee” and the site used is “Facebook”, “mixi” and “You Tube”.

Figure 22. Attributes and the reason for commencement of SNS (1<sup>st</sup> cluster)

In Figure 23, we make focus on “Utilize in Business” Factor for the 2<sup>nd</sup> cluster. We can confirm from this Figure that keyword which has strong correlation with “To collect information” is “-50” and “Independents” and the site used is “Ameba”, “Ameba pico”, “Niconico β” and “Ustream”.

Figure 23. Attributes and the reason for commencement of SNS (the 2<sup>nd</sup> cluster)

## 8. Conclusion

Social Networking Service (SNS) have become widely used in Japan in recent years.

In this paper, a questionnaire investigation was executed to SNS users and non-users in order to grasp its usage condition and examine expected psychological desire/function etc. systematically. Multi Correspondence Analysis, Quantitative Analysis and Text Mining Analysis were utilized for the analysis. By combining these methods effectively, we could make clear the important points and future expectations etc. systematically while using SNS.

As a result, we could confirm the following major items.

- (1) We can observe that 78% people use the SNS every day.
- (2) The usage of Facebook, mixi and Twitter, which are the genre of Integrated SNS, are frequently used and You Tube (one of the moving picture SNS) is the same.
- (3) We can observe that big contribution is achieved by the following items. First, ①(Make full communication with friends and acquaintances). Second, ⑩(Easiness in using). Third, ④(Provide the valuable information). Fourth, ⑨(To make perfect the security of individual information). Fifth, (Interconnection among SNS functions). From these, we can see that “Relationship”, “Function”, “Sympathy”, “Identify” and “Expression” are important factors in utilizing SNS. “Relationship”, “Sympathy” and “Expression”, which are listed in the former study, are all included.
- (4) We can observe that “⑨To make perfect the security of individual information” is the most and then “⑩Easiness in using” “⑤Enrich the collection of information” and “①Make full communication with friends and acquaintances” follow. Both users and non-users want to resolve the security anxiety at first. They also want to have easiness of handling. SNS which meet these requests will develop.
- (5) We can confirm the combination of common factors between Q6 and Q12. One is “Relationship” and another one is “Function”. “Participation” which is the first factor in Q6 is replaced into “Identify” in Q12. This implies that after confirming the profile of friend and goods, they proceed to the “Participation” stage. Thus, effective approach is considered by these combinations in demand and action.

Much more easy access to SNS is enabled by using smart-phone and tablet terminal from now on. Some of SNS will be selected unless they have particularly strengthened function. Users will also be divided into the group to the objective they seek. “Effective Utility of SNS” is required as for enterprise marketing tool.

Our various findings and knowledge obtained in this research will contribute to these issues effectively.

Systematic research investigation for SNS is still on the beginning stage. Such demonstrative research as this should be further developed with the increased case studies.

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## Appendix

Questionnaire concerning the SNS

Please answer the following questions. Please write down ○ to the answering items. Plural selection is allowed for the Question 3, 5, 7, 9, 10. Select ①~⑤ of the right column for the Question 6, 11, 12.

### 1. Do you use the SNS?

**Q1** ①YES ②NO\* If you answer “②NO”, then proceed to Q11, please.

### 2. How often do you use the SNS?

**Q2** ①More than 5 times a day ②Around 3~ 4 times a day ③Around 1~ 2 times a day  
④Around 4~ 5 times a week ⑤Around 2~ 3 times a week ⑥Around 1 times a week  
⑦Around 2~ 3 times a month ⑧Around 1 times a month ⑨Less than that

### 3. What kind of the SNS do you use?

**Q3** ①Facebook ②mixi ③Twitter ④Google+ ⑤YouTube ⑥Niconico β ⑦Ustream ⑧GREE  
⑨Mobage ⑩Hangame ⑪Ameba ⑫Taberogu ⑬KAKAKU.com ⑭Ameba pico ⑮myspace ⑯foursquare  
⑰Orkut ⑱PowerLink ⑲Life Shot ⑳Miscellaneous ( )

### 4. What kind of the SNS do you use the most?

( )

### 5. Why is it?

**Q5** ①Able to communicate with friends and acquaintances  
②Able to seek old friends and acquaintances  
③Able to seek new friends and acquaintances  
④Able to agree with/ appreciate the valuable information  
⑤Able to collect special and delightful information  
⑥Able to browse artists/ celebrities' comments  
⑦Able to apply for the campaign  
⑧Able to collect/ put out the company's services and service information  
⑨Able to collect/ put out hobby and interesting information  
⑩Able to post diary, tweets, moving images and photos  
⑪Able to play the game (including the online game)  
⑫Miscellaneous ( )

**6. What are the SNS's interesting and fascinating points?**

Importance	Think so very much	Slightly think so	Ordinary level	Slightly not think so	Do not think so
<b>Q6</b> ①Able to communicate with each other by diary and tweets ②Obtained much opportunities to contact with friends and acquaintances who were under rare contact ③Able to find new friend who has the same hobby and interest via the Net ④Able to get a feeling of intimacy by browsing artists'/ celebrities' comments ⑤Able to collect news and information efficiently ⑥Able to share sympathy by joining a group ⑦Able to share hobby and interests with friends and acquaintances ⑧Able to let others know about myself well ⑨Able to control the information for public, which is different from blog ⑩Able to retain the thinking of our own opinion and to make the record ⑪Rich online game ⑫Good for killing time ⑬Miscellaneous ()	①	②	③	④	⑤

**7. How did you come to use the SNS?**

<b>Q7</b> ①To create a new network ②Agree with/ appreciate the valuable information ③To collect information ④Utilize to my business ⑤To apply for the campaign ⑥To Put out and share the information ⑦Sound like fun by posting everything ⑧More easy to handle than those by phone and e-mail ⑨Suggestion by the friends and acquaintances ⑩Acquaintances and friends use them ⑪Became current topics ⑫Miscellaneous ()
---

**8. How often do you reply to the comments or share photos and news?**

<b>Q8</b> ①Every time ②Frequently ③Sometimes ④Scarcely ⑤Never
---

**9. What kind of the SNS are you going to continue to use?**

<b>Q9</b> ①Facebook ②mixi ③Twitter ④Google+ ⑤YouTube ⑥Niconico ⑦Ustream ⑧GREE ⑨Mobage ⑩Hangame ⑪Ameba ⑫Taberogu ⑬KAKAKU.com ⑭Ameba pico ⑮myspace ⑯foursquare ⑰Orkut ⑱PowerLink ⑲Life Shot ⑳Miscellaneous ()
---

**10. Why is it?**

<b>Q10</b> ①Want to enrich communication with friends and acquaintances ②Want to seek old friends and acquaintances ③Want to seek new friends and acquaintances ④Want to agree with/ appreciate the valuable information ⑤Want to collect beneficial and delightful information ⑥Want to browse artists/ celebrities' comments ⑦Want to apply for the campaign ⑧Want to collect/ put out the company's services and service information ⑨Want to collect/ put out hobby and interesting information ⑩Want to continue posting diary, tweets, moving images and photos ⑪Want to play the new game (including the online game) ⑫Miscellaneous ()
---

**11. Why don't you use the SNS?**

Importance		Think so very much	Slightly think so	Ordinary level	Slightly not think so	Do not think so
<b>Q11</b> ①Do not have interest ②Interesting but do not know how to use ③Anxious about security concerning individual information ④Anxious about fee ⑤Surrounding people do not use them ⑥Become poor in human communication ⑦Will waste a lot of time ⑧Feel uneasy how friends and acquaintances make response ⑨Cannot continue because it is too bothering ⑩Likely to increase the spam e-mail ⑪Miscellaneous ()		①	②	③	④	⑤

**12. What do you expect the SNS in the future?**

Importance	Think so very much	Slightly think so	Ordinary level	Slightly not think so	Do not think so
<b>Q12</b> ①Make full communication with friends and acquaintances ②Want to seek old friends, acquaintances and new friends ③Encounter the friend/lover of opposite sex ④Provide the valuable information ⑤Enrich the collection of information ⑥Have a space/ field for exchanging opinion about goods, service and politics ⑦Gather interesting information ⑧To disclose the information of himself ⑨To make perfect the security of individual information ⑩Easiness in using ⑪Restrict the writing in board by others ⑫Interconnection among SNS functions ⑬Miscellaneous ()	①	②	③	④	⑤

**About yourself**

<b>Q13 &lt;Gender&gt;</b> ①Male ②Female
<b>Q14 &lt;Age&gt;</b> ( ) years old
<b>Q15 &lt;Occupation&gt;</b> ①Student②Government Employee ③Company Employee ④School Teacher/Staff ⑤ Clerk of Organization ⑥Independents ⑦Temporary Employee ⑧Part-timers ⑨Miscellaneous ()
<b>Q16&lt;Address&gt;</b> Prefecture : () City : ()
<b>Q17&lt;Are you married?&gt;</b> ①Married②Single
<b>Q18&lt;How many children do you have?&gt;</b> ( )
<b>Q19&lt;Are you positive to do anything?&gt;</b> ①Positive②Somewhat positive ③Ordinary level ④Somewhat passive⑤Not positive
<b>Q20&lt; Do you like to play with many others?&gt;</b> ①Think so very much ②Slightly think so ③Ordinary level ④Slightly not think so ⑤Do not think so
<b>Q21&lt;How do you spend holidays?&gt;</b> ①Outdoor②Indoor ③Cannot choose either
<b>Q22&lt;What is the most important thing to you?&gt;</b> ①Affection②Safety and security ③Honor ④Clothes/Eating/House⑤Self-realization ⑥Contribution to society ⑦Recognized from others ⑧Miscellaneous ()

The figure below is an on-line data gathering Form for Questionnaire Investigation.

The screenshot shows a web browser window with multiple tabs. The active tab is titled "Survey on SNS" and displays a Google Docs form. The form has a title "■ Survey on SNS" and a detailed introduction paragraph in English. Below the introduction, there is a section marked "Required" with the question "Is the use of SNS". Two radio button options are provided: "YES" and "NO". A "Continue" button is located below the options. At the bottom of the form, it says "Powered by Google Docs" and provides links for "Report Abuse", "Terms of Service", and "Additional Terms". The browser's address bar shows the URL "https://docs.google.com".

Figure 24. On-line data gathering form for questionnaire investigation, <https://docs.google.com>