

RCSS ディスカッションペーパーシリーズ

ISSN-1347-636X

第 64 号 2008 年 5 月

Discussion Paper Series

No.64 May, 2008

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Abstract

This paper provides the empirical study about whether or not, the new style knowledge management by using Blog and SNS (Social Networking Service, hereinafter SNS) within the intranets has the positive effect for the enterprises activity to create new products or services.

We consider that the key concept is Social Capital to make the knowledge management more effective.

When the social capital is formed based on confidential relationships in an enterprise, the utilization of Blog and SNS promotes information exchange and information sharing between employees, especially information concerning examples of success and/or failure. This paper proves that utilization of Blog and SNS have a positive effect on development of new products and services. Employees obtain networks of contacts and knowledge through the Blog and SNS, and utilize them for their business on an ongoing basis. They also teach and lead other employees by using such networks and knowledge. This is statistically proven effective.

In addition, the effect of utilizing Blog and SNS on business would be influenced by the kind of decision-making processes and organizational structure.

From our empirical study, we find that information exchange and sharing through the utilization of Blog and SNS brings about a positive effect on production innovation more so in decentralized companies rather than centralized ones in Japan as well.

Keywords

Blog, Social Networking Service (SNS), Knowledge Management, Social Capital, Centralized decision-making process Decentralized decision-making process

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Introduction

Our main concern is to research what type of corporation is suitable to create the innovation especially with the views of the communication network, and organization.

Companies are introducing intranet Blog¹ or SNS for the purposes of knowledge management and to revitalize employees' communication, and the number of these companies has been increasing.²

CGM (consumer-generated media) originated as a reference to posts of information exchange made by consumers on the internet, such as Blog and SNS, on products that they have purchased or would purchase. On the other hand, companies introduce Blog and SNS expecting to generate job-related information in the intranet, and to encourage employees to communicate actively.

If the manner of utilization is appropriate, it is our belief that Blog and SNS facilitate communication between employees and can be utilized knowledge management more efficiently, than traditional digital communication tools.

Knowledge management includes capturing insight and experience to make them available. McAfee (2006) calls new type of collaborative platforms, wikis, blogs, and group-messaging software as Enterprise 2.0 technologies which can make a corporate intranet into a constantly structure. So McAfee concludes "Enterprise 2.0 technologies have the potential to usher in a new era by making both practices of knowledge work and its outputs more visible".

One of the reasons Blog and SNS achieve efficient knowledge management is that they make it possible to search easily. With RSS reader, it is possible to collect information from internet sites quickly. SNS also visualize network of contacts. One can find the correct information from a correct source from community discussions or diaries in the SNS.

Of course, this does not mean that the introduction of Blog and SNS always makes it possible for employees to achieve effective knowledge management. In the absence of employees sharing useful job-related information in the intranet, old knowledge would simply accumulate and the creation of new values within the company would be impossible.

The conditions under which Blog and SNS could achieve knowledge management must be considered. We regard feelings of trust between employees and an atmosphere in which employees feel free to transmit information as minimum necessary conditions. Not limited to Blog and SNS, this is important even in daily face-to-face communication. If information

¹ Short for "web log".

² The Ministry of Internal Affairs and Communications (2007) states that, "in the background of the deepening ubiquitous net society such as the spread of mobile phones, the increasingly high functionality of mobile information-communication terminals and the advances in broadband network installation, is the expansion of the base of individuals disseminating information. Services known as consumer-generated media (CGM) such as Blog, SNS and word-of-mouth sites have been rapidly growing in recent years".

is exchanged but there is no mutual positive effect, it would be difficult for information exchange to occur.

Particularly in the “virtual world”, without trustworthy information there could not be sharing knowledge.

Especially in the intranet SNS, it is possible to identify the employee’s number and ID from the access data. In this circumstance, employees feel more trust than in completely anonymous conditions.

We introduce the concept of social capital, and discuss the importance of trusting relationships in networks. The social capital is originally a concept which analyzes the relationships of trust among people in society, but we think it can be applied to the Internet space in enterprises.

In addition, we also found that the effect of utilizing Blog and SNS for work would be influenced by the kind of decision-making processes and organizational structure. This is because these primary factors have an impact on communication within an enterprise.

Whether or not company’s hierarchy is centralized or decentralized determines the flow of communication and information.

Therefore, in this paper we examine two cases: (1) when the decision-making process of an enterprise is centralized, and (2) when the decision-making process of a company is decentralized and has a flattened hierarchy. We verify the effect of utilizing Blog and SNS in these two cases.

The sections are structured as follows. In section 2, we introduce the discussion on social capital. In section 3, we review the questionnaire survey that is the subject of our empirical analysis. In section 4, we study the relationship between social capital and knowledge management utilizing Blog and SNS, and also in section 5 study the relationship between knowledge management and corporate innovation. The final Section 6 is the conclusion.

2. The importance of Social Capital

Our hypothesis is that the abundance of the social capital can make it possible for employees to smoothly exchange information, and it is effective for enterprises to introduce Blog and SNS for knowledge management in this kind of environment. In this situation, the fusion of knowledge is achieved and this generates new values.

The typical definition of social capital is in the definition with social scholar Putnam, which is “social capital refers to features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit” (Putnam (1995)). Many assert the importance of social capital in regional areas or certain

communities.

Tsai and Ghoshal (1998) have conducted positive analysis on social capital playing an important role in the workplace, specifically with a multinational electronics corporation as its subject. Tsai and Ghoshal decomposes social capital into three parts: (1) Social Interaction Ties, (2) Shared Vision, (3) Trust and Trustworthiness.

They analyze the correlation of these factors. Social Interaction Ties consist of the questions, “Which people of which units do you spend the most time together in social occasions?”, “Please indicate the units which maintain close social relationships with your unit”. Shared Vision consists of the questions, “Our unit shares the same ambitions and vision with other units at work”, and “People in our unit are enthusiastic about pursuing the collective goals and missions of the whole organization”. “Trust and Trustworthiness” consist of the questions, “Please indicate the units which you belong you can rely on without any fear that they will take advantage of you or your unit even if the opportunity arises” and “In general, people from which of the following units will always keep the promise they make to you?” Tsai and Ghoshal concludes that Social Interaction Ties and Trust and Trustworthiness influence the combination of managerial resources, and have an impact on product innovation.

Previous works on the positive analysis measuring social capital with SNS include Minetaki and Yoshida (2006). Minetaki and Yoshida analyzed the correlation between active communication among employees through Blog and SNS and innovation from the perspective of employees. The main conclusion of this research is that the degree of awareness exchange on customers or clients correlates positively with the generation of new products, services and plans within three years.

However, Minetaki and Yoshida had reservations about a number of points. First, structural analysis had not been conducted regarding social capital. Second, with only employees’ perspectives there was much room for subjectivity to play a part in the answers, and it was therefore necessary to research from a different angle.

In this research, therefore, we conduct a positive analysis on social capital within enterprises using models that have been verified. We also report the results of analysis regarding the relationship between the utilization of Blog and SNS and the generation of new products, services and plans in enterprises from the perspective of management. By analyzing from the perspective of management we were able to add questions outside of the utilization of Blog and SNS covering the entire organization, making more comprehensive analysis possible.

Specifically, we could use questions regarding the organizational structure and the decision-making process within the enterprise. This makes it possible to add the verification of the effects of information exchange and sharing from Blog and SNS to the traditional research conducted on whether the effects of IT in Japanese enterprises differ

depending on the organizational structure and the decision-making process. Moreover, traditional research on the effects of IT on Japanese enterprises was not done from a social capital perspective. This point should also provide new knowledge to this field.

Communication that utilizes Blog and SNS makes it possible to write down one's feelings and thoughts in a straightforward manner, and also allows for fast information exchange concerning work such as awareness of clients or examples of success and failure. The characteristics of these communication tools of Blog and SNS are important for creation of new values in an enterprise. This is because new knowledge is oftentimes born from a chaotic state before it becomes formal knowledge. In addition, mutual trust relationships become a premise in the exchange of information before it becomes a formal document such as an official report. Even within enterprises, trust relationships become particularly important when dealing with relationships only existing on the net. Here we find the reason why social capital is focused on in this research and Blog and SNS analysis by Minetaki and Yoshida.

Norris (2003) offers the two hypotheses that "there is a strong likelihood that participation in groups on the internet strengthens social connections among people with homogeneous interests and backgrounds", and "there is a strong likelihood that participation in groups on the internet heightens social bonds between people with different interests".

3. Outline of the questionnaire survey

The subject data in this research is a questionnaire survey conducted in March 2007. The subjects of this questionnaire survey are management above middle management who use internet (including corporate managers), with valid responses numbering 1545 in total³. To find the attributes of the data, respondents were shown by the Company size (table 1), Sex (table 2), Age (table 3), and Occupation (table 4).

Concerning about company size, small-scale company represent a relatively large percentage with companies with fewer than 100 employees at about 48%. Further thought on this point will be necessary in terms of the positive analysis.

Concerning about Sex, number of male is about 8 times than that of female.

Concerning about Age, while the highest percentage came from the late 30's to early 40's age bracket, the late 20's bracket was at about 8% and the 50's or above bracket was at 14%, suggesting that imbalances in distribution were not too significant.

Concerning about Occupation, executive manager, manager (clerk), and manager (engineer) are not so large difference.

When we step up the next section, trying the empirical study, we must to estimate to

³ We use online survey questionnaire.

consider that those data attribution brings the sampling bias.

The key statistics (sample number, average, standard deviation, minimum value and maximum value) of the variables used in the Section 4 and 5 analyses are shown in table5 which has four categories of (1)Innovation,(2)Knowledge Management, (3)Social Capital, and (4) Organization.

Table 1 Description of Data set2 (Company Size)

Number of employees	number	%
under 10	337	21.81
10-99	415	26.86
100-299	176	11.39
300-499	94	6.08
500-999	131	8.48
1000-4999	155	10.03
5000-10000	84	5.44
over 10000	153	9.9
Total	1,545	100

Table 2 Description of Data set1 (Survey Respondents' Sex)

Sex	number	%
Male	1,370	88.67
Female	175	11.33
total	1,545	100

⁵ Each question is in five degrees.

Table 3 Description of Data set1 (Survey Respondents' Age)

Age	number	%
25-29	116	7.51
30-34	326	21.1
35-39	336	21.75
40-44	316	20.45
45-49	242	15.66
50-54	115	7.44
55-59	75	4.85
over 60	19	1.23
Total	1,545	100

Table 4 Description of Data set3 ((Survey Respondents' Occupation)

Occupation	number	%
executive manager	407	26.34
manager (clerk)	460	29.77
manager (engineer)	418	27.06
others	260	16.83
Total	1,545	100

Table 5 Basic Statistics

Category	Variables	Number of Observations	Average	S.E.	Minum degree	Maxum degree
Innovation	Successful for creating new products/services in this three years	1545	3.06	0.88	1	5
Knowledge Management	Percentage of employees utilizing Blog based knowledge for business	1202	2.67	1.06	1	5
Knowledge Management	Percentage of employees utilizing SNS based knowledge for business	718	2.86	1.03	1	5
Knowledge Management	Number of cases leaders who gain Blog based knowledge teach others	1202	2.54	1.04	1	5
Knowledge Management	Number of cases leaders who gain SNS based knowledge teach others	718	2.67	1.04	1	5
Knowledge Management	Number of cases where business practice is improvemnet by Blog/SNS based communication about failure or success examples	1045	3.54	0.81	1	5
Social Capital	Degree of eagerness pursuing the collective goals and dreams of whole the company	1545	3.21	0.85	1	5
Social Capital	Open atmosphere talking to each other	1545	3.40	0.91	1	5
Social Capital	Degree of willingness to support other employee's work not concerned with own business	1545	3.42	0.92	1	5
Social Capital	Employees like their company	1545	3.45	0.84	1	5
Social Capital	Extent to which trust existed among employees	1545	3.60	0.82	1	5
Social Capital	Managers express understanding when collaborating beyond divisions	1545	3.21	0.94	1	5
Social Capital	Managers support financially when collaborating beyond divisions	1545	3.01	0.94	1	5
Organization	Creating new goods and services with the networks outside company	1545	3.14	0.93	1	5
Organization	Degree of speed of decision-making	1545	3.24	0.98	1	5
Organization	Degree of easiness that employee's opinions can reach the executive	1545	3.26	0.97	1	5

4. Empirical study about the relationship between social capital and knowledge management by Blog and SNS

In this section, we research the relationship between social capital and new type of knowledge management using Blog and SNS. Firstly, we make some factors related social capital. Secondly, we estimate the dependent variable of knowledge management by using Ordered Probit Model.

We choose the following variables as social capital⁵ referring to Ghoshal Tsai.

1. Degree of eagerness pursuing the collective goals and dreams of whole company
2. Open atmosphere talking freely each other
3. Degree of willingness to support other employee's work not concerned with one's own business
4. Affection toward company by employees
5. Degree of trust among employees
6. Management understanding when collaborating beyond divisions
7. Management financial support when collaborating beyond divisions

We use the factor analysis for above variables of social capital. Table6 shows the result of the factor analysis.

Factor 1 correlates positively highly variables of management understanding when collaborating beyond divisions and Management financial support when collaborating beyond divisions, so factor 1 can be interpreted as the factor of collaboration beyond divisions.

Factor 2 correlates positively highly variables of Affection toward company by employees and Degree of trust among employees, so factor 2 can be interpreted as the factor related to individual emotions.

Factor 3 correlates positively highly variables of Open atmosphere talking freely each other and Degree of willingness to support other employee's work not concerned with one's own business so factor 3 can be interpreted as the factor of interrelationships among employees in an organization.

According to our result of factor analysis, the social capital are formed by the factor of collaboration beyond divisions, the factor related to individual emotions and the factor of interrelationships among employees in an organization.

We try to investigate the relationship between the new type of knowledge management by using Blog and SNS and those factors of the social capital.

We estimate following equation1.

$$KM_i = \alpha_1 Factor1_i + \alpha_2 Factor2_i + \alpha_3 Factor3_i + \sum \lambda_j control_{ij} + constant + \varepsilon_i \quad (1)$$

There are four patterns of the dependent variables of KM_i .

KM(KnowledgeManagemet)

1. The percentage of employees continuously utilizing knowledge and contacts found in Blog for work.
2. The percentage of employees continuously utilizing knowledge and contacts found in SNS for work.
3. The degree to which employees, who are continuously utilizing and applying knowledge and contacts found in Blog for work, lead and instruct other employees.
4. The degree to which employees, who are continuously utilizing and applying knowledge and contacts found in SNS for work, lead and instruct other employees.

In each case there are the following independent variables.

Factor1-Factor3 are the social capital variables as follows.

Factor(SocialCapital)

Factor1: the factor of collaboration beyond divisions

Factor2: the factor related to individual emotions

Factor3: the factor of interrelationships among employees in an organization

In each case, we use the following control variables to control the other individual effect of the dependent variable.

Control(Control variables)

control: Seize of company (number of employees), Sex, Age, Job

We estimate the dependent variables of knowledge management by using Blog and SNS by using the social capital factors and the control variables where the estimation method is the Ordered Probit Model.

The results from the empirical study in this section are summarized as following.

The results of the estimates are shown in table 8. In all four estimates, the social capital factors were statistically at a 1% level significant.

In this way, we find that the variables of social capital have positive correlations with

information exchange through Blog or SNS in all cases.

Especially, Factor3 that is the factor of interrelationships among employees in an organization has the largest positive effect on the knowledge management.

5. Empirical study about the relationship between knowledge management by Blog and SNS and innovation

In this section, we research the relationship between new type of knowledge management using Blog and SNS and corporate innovation as following equation.

$$Innovation_i = \sum \beta_j KM_{ij} + \sum \theta_k Org_{ik} + \sum \omega_l Contorol_{il} + constant + \mu_i \quad (2)$$

The dependent variable is the factor which means innovation

Innovation

Successful for creating new products/services in this three years

There are the following independent variables.

KM(KnowledgeManagemet)

- 1) The percentage of employees continuously utilizing knowledge and contacts found in Blog for work.
- 2) The percentage of employees continuously utilizing knowledge and contacts found in SNS for work.
- 3) The degree to which employees, who are continuously utilizing and applying knowledge and contacts found in Blog for work, lead and instruct other employees.
- 4) The degree to which employees, who are continuously utilizing and applying knowledge and contacts found in SNS for work, lead and instruct other employees.
- 5) Blog/SNS based communication about failure or success examples

Org(CorporateOrganization)

- 1) Creating new goods and services with the networks outside company
- 2) Degree of speed of decision-making
- 3) Degree of easiness that employee's opinions can reach the executive

We use the following control variables to control the other individual effect of the dependent variable.

Control(Control variables)

control : Seize of company (number of employees), Sex, Age, Job

We add the perspective of decision-making processes and organizational structure of companies to the analysis conducted in the previous section. Research on differences in the effect of ICT on productivity depending on a company's decision-making process and organizational structure has been conducted primarily by MIT's Brynjolfsson in the US. In Japan this research has been pursued by the Economic Planning Agency of Japan (2000), the Cabinet Office (2004) and Minetaki (2005).

The research of Brynjolfsson, Economic Planning Agency of Japan (2000) and the Cabinet Office (2004) found that ICT development in companies with the decentralized decision-making processes and "flattened" organizations leads to more improvement in productivity. One reason for this result is that in a decentralization company, employees at work can voluntarily share realizations or awareness within the company, and also the discretionary scope for these employees to make decisions will expand based on information shared within the company. Productivity is increased in both instances.

As tools that collect the awareness of employees, Blog and SNS seem to be more effective compared to communication tools used in the past. Instead of an official and formal report, one can freely write one's feelings and awareness in a diary format and can also receive feedback.

Until now, research focusing on Blog and SNS in the discussion of ICT development and productivity has been close to nonexistent. In this research, we focus on the aspect of drawing out awareness, the strength of Blog and SNS, and verified the effect on company activity.

Estimation results are shown in Table8-13. Table8-10 show the cases of creating new products, and table11-13 for the cases of creating new services.

In both creating new products, and new services, they include the cases considering differences in decision-making processes of centralized and decentralized.

According to table8, in every case, all knowledge management variables are statistically significant. Especially the variable of Blog/SNS based communication about failure or success examples is 1% level significant.

Table 9 shows the result of centralized decision-making processes case. A few of knowledge management variables are statistically significant, but almost not significant. Especially the variable of Blog/SNS based communication about failure or success

examples is not significant in every case.

Table 10 shows the result of decentralized decision-making processes case. Many knowledge management variables are statistically significant. Especially, the variables of percentage of employees continuously utilizing knowledge and contacts found in Blog /SNS for work, and variables of the degree to which employees who are continuously utilizing and applying knowledge and contacts found in Blog/SNS for work lead and instruct other employees are 1% level significant.

According to table11-13 for the cases of creating new services, the significance of knowledge management by using Blog/SNS variables are relatively weaker than the cases of creating new products. To compare centralized decision-making processes with decentralized decision-making processes, the centralized case shows no correlation between corporate innovation and knowledge management by using Blog/SNS.

Table 6
Results of Factor Analysis Regarding Social Capital Variables⁶

	Factor1	Factor2	Factor3
Degree of eagerness pursuing the collective goals and dreams of whole the company	0.257	0.302	0.505
Open atmosphere talking freely each other	0.275	0.302	0.710
Degree of willingness to support other employee's work not concerned with one's own business	0.287	0.250	0.606
Affection toward company by employees	0.250	0.949	0.192
Degree of trust among employees	0.270	0.505	0.445
Management understanding when collaborating beyond divisions	0.954	0.235	0.185
Management financial support when collaborating beyond divisions	0.609	0.274	0.228

⁶ Axis rotation uses the varimax method.

Table 7
Estimates Regarding the Utilization of Social Capital and Blog/SNS

Dependent variables	Percentage of employees utilizing Blog based knowledge for business		Percentage of employees utilizing SNS based knowledge for business		Number of cases leaders who gain Blog based knowledge teach others		Number of cases leaders who gain SNS based knowledge teach others	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
Factor1	0.2018	0.0312 ***	0.2031	0.0406 ***	0.2327	0.0314 ***	0.1601	0.0406 ***
Factor2	0.1456	0.0312 ***	0.1933	0.0425 ***	0.1560	0.0314 ***	0.1833	0.0425 ***
Factor3	0.2961	0.0380 ***	0.2537	0.0504 ***	0.2934	0.0382 ***	0.2696	0.0507 ***
Number of employees	0.0373	0.0154 **	0.0251	0.0191	0.0414	0.0154 ***	0.0360	0.0191 *
Sex	0.2017	0.0966 **	-0.0492	0.1189	0.0918	0.0970	-0.0643	0.1189
Age	0.0046	0.0190	0.0150	0.0247	0.0167	0.0190	-0.0107	0.0247
Job(manager,clerk)	-0.0989	0.0940	-0.1163	0.1291	-0.0419	0.0944	-0.0749	0.1291
Job(manager,engineers)	-0.0892	0.0948	-0.2266	0.1269 *	0.0329	0.0951	-0.2568	0.1271 **
Job(Others)	-0.0262	0.1019	-0.2062	0.1368	0.0301	0.1024	-0.2150	0.1370
Number of Observations	1202		718		1202		718	
Pseudo R2	0.0421		0.0420		0.0448		0.0348	

***:statistically 1% significant, **: statistically 5% significant, *:statistically 10% significant

Table 8
Effects of Blog/SNS on corporate Innovation
Creating New Products

Dependent variable: Successful for creating new products in this tree year	Case1	Case2	Case3	Case4
Percentage of employees utilizing Blog based knowledge for business	0.1356 0.0448 ***			
Percentage of employees utilizing SNS based knowledge for business		0.1091 0.0569 *		
Number of cases leaders who gain Blog based knowledge teach others			0.1992 0.0458 ***	
Number of cases leaders who gain SNS based knowledge teach others				0.1760 0.0559 ***
Blog/SNS based communication about failure or success examples	0.2432 0.0531 ***	0.2475 0.0703 ***	0.2375 0.0522 ***	0.2310 0.0690 ***
Creating new goods and services with the newtworks outside company	0.4127 0.0494 ***	0.5258 0.0648 ***	0.3954 0.0497 ***	0.5133 0.0650 ***
Degree of speed of decision-making	0.2805 0.0506 ***	0.3451 0.0638 ***	0.2673 0.0508 ***	0.3346 0.0640 ***
Degree of easiness that employe's opinions can reach the executive	0.1141 0.0520 **	0.1740 0.0664 ***	0.1136 0.0519 **	0.1814 0.0661 ***
Number of employees	0.0507 0.0194 ***	0.0441 0.0238 *	0.0495 0.0194 **	0.0419 0.0238 *
Sex	0.1714 0.1209	0.1678 0.1425	0.1803 0.1209	0.1684 0.1428
Age	0.0126 0.0236	-0.0108 0.0293	0.0083 0.0237	-0.0095 0.0294
Job(manager,clerk)	0.0804 0.1216	0.0828 0.1548	0.0776 0.1216	0.0978 0.1550
Job(manager,engineers)	0.0002 0.1223	0.2308 0.1572	-0.0210 0.1220	0.2574 0.1577
Job(Others)	0.2420 0.1312 *	0.3881 0.1677 **	0.2367 0.1313 *	0.4119 0.1682 **
Number of Observations	830	555	830	555
Pseudo R2	0.1487	0.1782	0.1534	0.1826

***:statistically 1% significant, **: statistically 5% significant, *:statistically 10% significant

Table 9

**Effects of Blog/SNS on corporate Innovation(Centralized Decision-making company)
Creating New Products**

Dependent variable: Successful for creating new products in this tree year	Case5	Case6	Case7	Case8
Percentage of employees utilizing Blog based knowledge for business	0.1728 0.0854 **			
Percentage of employees utilizing SNS based knowledge for business		0.17641 0.11347		
Number of cases leaders who gain Blog based knowledge teach others			0.2335 0.0940 **	
Number of cases leaders who gain SNS based knowledge teach others				0.1853 0.1163
Blog/SNS based communication about failure or success examples	0.0656 0.1051	0.14717 0.14953	0.0382 0.1065	0.1177 0.1566
Creating new goods and services with the newtworks outside company	0.6281 0.1037 ***	0.64173 0.13928 ***	0.6148 0.1035 ***	0.6182 0.1384 ***
Degree of speed of decision-making	0.2058 0.1044 **	0.47537 0.14039 ***	0.1874 0.1048 *	0.4692 0.1406 ***
Degree of easiness that employe's opinions can reach the executive	0.1630 0.1060	0.2594 0.14365 *	0.1734 0.1048 *	0.2889 0.1431 **
Number of employees	-0.0169 0.0355	0.1406 0.0466 ***	-0.0208 0.0356	0.1402 0.0466 ***
Sex	0.0706 0.2120	-0.1509 0.2431	0.0640 0.2122	-0.1604 0.2432
Age	0.0270 0.0450	-0.0336 0.0591	0.0184 0.0452	-0.0393 0.0593
Job(manager,clerk)	0.4897 0.2314 **	-0.1410 0.2896	0.5297 0.2327 **	-0.1003 0.2924
Job(manager,engineers)	0.3166 0.2267	0.1991 0.2873	0.3493 0.2279	0.2277 0.2895
Job(Others)	0.3625 0.2627	0.3567 0.3240	0.4084 0.2638	0.4225 0.3255
Number of Observations	239	159	239	159
Pseudo R2	0.1816	0.2674	0.185	0.2677

*****:statistically 1% significant, **: statistically 5% significant, *:statistically 10% significant**

Table 10**Effects of Blog/SNS on corporate Innovation (Decentralized Decision-making company)****Creating New Products**

Dependent variable: Successful for creating new products in this tree year	Case9	Case10	Case11	Case12
Percentage of employees utilizing Blog based knowledge for business	0.2161 0.0659 ***			
Percentage of employees utilizing SNS based knowledge for business		0.2242 0.0821 ***		
Number of cases leaders who gain Blog based knowledge teach others			0.2515 0.0663 ***	
Number of cases leaders who gain SNS based knowledge teach others				0.2300 0.0793 ***
Blog/SNS based communication about failure or success examples	0.1954 0.0784 *	0.0929 0.1021	0.2090 0.0765 ***	0.0922 0.1015
Creating new goods and services with the newtworks outside company	0.5064 0.0787 ***	0.6569 0.0987 ***	0.4948 0.0789 ***	0.6589 0.0988 ***
Degree of speed of decision-making	0.2782 0.0724 ***	0.4308 0.0900 ***	0.2649 0.0725 ***	0.4260 0.0902 ***
Degree of easiness that employe's opinions can reach the executive	0.1993 0.0801 **	0.2490 0.0980 **	0.2086 0.0798 ***	0.2624 0.0979 ***
Number of employees	0.0883 0.0270 ***	0.0960 0.0332 ***	0.0885 0.0270 ***	0.0939 0.0332 ***
Sex	0.0745 0.1769	0.2847 0.1997	0.0726 0.1768	0.2531 0.2002
Age	0.0027 0.0337	-0.0192 0.0413	-0.0004 0.0338	-0.0242 0.0413
Job(manager,clerk)	0.2191 0.1837	0.1656 0.2182	0.2093 0.1836	0.1592 0.2181
Job(manager,engineers)	0.1731 0.1867	0.3742 0.2234 *	0.1631 0.1865	0.3693 0.2231 *
Job(Others)	0.3671 0.2002 *	0.3096 0.2431	0.3597 0.2005 *	0.3226 0.2433
Number of Observations	408	298	408	298
Pseudo R2	0.1905	0.2413	0.194	0.2426

***:statistically 1% significant, **: statistically 5% significant, *:statistically 10% significant

Table 11**Effects of Blog/SNS on corporate Innovation****Creating New Services**

Dependent variable: Successful for creating new services in this tree year	Case13	Case14	Case15	Case16
Percentage of employees utilizing Blog based knowledge for business	0.0839 0.0450 *			
Percentage of employees utilizing SNS based knowledge for business		0.1149 0.0574 **		
Number of cases leaders who gain Blog based knowledge teach others			0.1488 0.0459 ***	
Number of cases leaders who gain SNS based knowledge teach others				0.1525 0.0562 ***
Blog/SNS based communication about failure or success examples	0.2661 0.0533 ***	0.2144 0.0710 ***	0.2553 0.0524 ***	0.2079 0.0697 ***
Creating new goods and services with the new networks outside company	0.3893 0.0495 ***	0.4864 0.0654 ***	0.3745 0.0499 ***	0.4759 0.0657 ***
Degree of speed of decision-making	0.2857 0.0507 ***	0.3186 0.0643 ***	0.2747 0.0509 ***	0.3097 0.0645 ***
Degree of easiness that employe's opinions can reach the executive	0.2203 0.0523 ***	0.2843 0.0674 ***	0.2182 0.0522 ***	0.2935 0.0672 ***
Number of employees	0.0383 0.0195 **	0.0303 0.0240	0.0369 0.0195 *	0.029 0.024
Sex	0.1458 0.1217	0.1022 0.1441	0.1492 0.1216	0.103 0.144
Age	0.0035 0.0237	-0.0414 0.0297	-0.0001 0.0238	-0.040 0.030
Job(manager,clerk)	-0.0642 0.1223	-0.1173 0.1575	-0.0640 0.1222	-0.110 0.157
Job(manager,engineers)	-0.1156 0.1229	-0.1705 0.1595	-0.1279 0.1226	-0.154 0.160
Job(Others)	0.1823 0.1317	0.0190 0.1691	0.1798 0.1318	0.033 0.169
Number of Observations	830	555	830	555
Pseudo R2	0.163	0.1961	0.1664	0.1985

***:statistically 1% significant, **: statistically 5% significant, *:statistically 10% significant

Table 12**Effects of Blog/SNS on corporate Innovation(Centralized Decision-making company)****Creating New Services**

Dependent variable: Successful for creating new services in this tree year	Case17	Case18	Case19	Case20
Percentage of employees utilizing Blog based knowledge for business	-0.0258 0.0841			
Percentage of employees utilizing SNS based knowledge for business		0.1422 0.1119		
Number of cases leaders who gain Blog based knowledge teach others			0.0677 0.0919	
Number of cases leaders who gain SNS based knowledge teach others				0.1880 0.1156
Blog/SNS based communication about failure or success examples	0.1026 0.1043	-0.0307 0.1508	0.0591 0.1056	-0.0749 0.1568
Creating new goods and services with the newnetworks outside company	0.4728 0.1011 ***	0.7373 0.1405 ***	0.4720 0.1011 ***	0.7180 0.1401 ***
Degree of speed of decision-making	0.2819 0.1040 ***	0.3965 0.1382 ***	0.2761 0.1042 ***	0.3860 0.1385 ***
Degree of easiness that employe's opinions can reach the executive	0.3064 0.1060 ***	0.2936 0.1437 **	0.2892 0.1045 ***	0.3192 0.1433 **
Number of employees	0.0241 0.0353	0.0622 0.0456	0.0219 0.0354	0.0611 0.0457
Sex	0.0263 0.2113	-0.1486 0.2407	0.0063 0.2110	-0.1612 0.2413
Age	0.0037 0.0447	-0.0839 0.0587	0.0005 0.0449	-0.0904 0.0590
Job(manager,clerk)	0.0279 0.2280	-0.1529 0.2904	0.0442 0.2288	-0.1024 0.2937
Job(manager,engineers)	0.1088 0.2249	-0.1681 0.2874	0.1269 0.2256	-0.1273 0.2900
Job(Others)	0.0300 0.2595	-0.1815 0.3200	0.0399 0.2600	-0.1241 0.3212
Number of Observations	239	159	239	159
Pseudo R2	0.1673	0.2646	0.168	0.2671

*****:statistically 1% significant, **: statistically 5% significant, *:statistically 10% significant**

Table 13**Effects of Blog/SNS on Company Activity(Decentralized Decision-making company)****Creating New Services**

Dependent variable: Successful for creating new services in this tree year	Case21	Case22	Case23	Case24
Percentage of employees utilizing Blog based knowledge for business	0.0629 0.0660			
Percentage of employees utilizing SNS based knowledge for business		0.1249 0.0811		
Number of cases leaders who gain Blog based knowledge teach others			0.1223 0.0663 *	
Number of cases leaders who gain SNS based knowledge teach others				0.1710 0.0791 **
Blog/SNS based communication about failure or success examples	0.2970 0.0795 ***	0.1649 0.1031	0.2863 0.0774 ***	0.1457 0.1026
Creating new goods and services with the newtworks outside company	0.4516 0.0792 ***	0.5868 0.0987 ***	0.4412 0.0794 ***	0.5856 0.0988 ***
Degree of speed of decision-making	0.3552 0.0735 ***	0.4172 0.0896 ***	0.3482 0.0737 ***	0.4109 0.0898 ***
Degree of easiness that employe's opinions can reach the executive	0.2878 0.0811 ***	0.2467 0.0981 ***	0.2859 0.0807 ***	0.2540 0.0980 ***
Number of employees	0.0654 0.0272 **	0.0541 0.0330	0.0648 0.0272 **	0.052 0.033
Sex	0.0960 0.1790	0.1579 0.1984	0.0801 0.1788	0.136 0.199
Age	0.0253 0.0341	-0.0206 0.0414	0.0234 0.0342	-0.024 0.041
Job(manager,clerk)	0.1309 0.1857	0.1447 0.2193	0.1355 0.1855	0.145 0.219
Job(manager,engineers)	0.1350 0.1888	0.0086 0.2233	0.1416 0.1886	0.017 0.223
Job(Others)	0.4938 0.2031 **	0.2323 0.2431	0.4916 0.2033 **	0.238 0.243
Number of Observations	408	298	408	298
Pseudo R2	0.2062	0.2243	0.2087	0.2275

*****:statistically 1% significant, **: statistically 5% significant, *:statistically 10% significant**

6. Conclusion

From our empirical studies shown in section 4 and 5, we conclude as follows.

- (1) Social capital is formed by three factors. First factor is collaboration beyond divisions, second factor is individual emotions and third factor is interrelationships among employees in an organization.
- (2) The factors of social capital have positive correlations with knowledge management by information exchange through Blog or SNS.
- (3) Especially, the factor of interrelationships among employees in an organization has the largest positive effect on the knowledge management.
- (4) The knowledge management by information exchange through Blog or SNS has positive effect on innovation in creating new products and new services.
- (5) Especially the Blog/SNS based communication about failure or success examples is very important on innovation in creating new products.
- (6) To compare centralized decision-making processes company with decentralized decision-making processes company, the centralized case shows no correlation between corporate innovation and knowledge management by information exchange through Blog or SNS.

We can show the importance of new type of knowledge management by information exchange through Blog or SNS. Failure or success information concerning about business can be shared with together in company Blog or SNS. This type of information is crucial to corporate innovation. To bring such good effect, we need the high level of social capital in the company. And also the corporate organization is important. The company where its decision-making process is decentralized can have better effect than the centralized case. Our empirical study suggests the direction for the Japanese companies to advance.

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