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Principal Component Analysis on the Twitter Data in the Restaurant Industry

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Abstract

Social Networking Service (SNS) is prevailing rapidly in Japan in recent years. Facebook, mixi and Twitter are the popular one. These are utilized in various field of life together with the convenient tool such as smart-phone. In this paper, principal component analysis and cluster analysis are executed in order to clarify the relationship among the corporate performance and the SNS utilization condition. We focus on restaurant industry and convenience store industry, where marketing competition which utilizes SNS to consumers is fierce. Marketing application would then be extracted. Reviewing past researches, there are some related papers, but they do not handle these analysis techniques. Moreover there have been few researches made on our theme stated above. Some interesting results were obtained.

Keywords: SNS, twitter, twitter followers, principal component analysis, cluster analysis

1. Introduction

Social Networking Service (SNS) is prevailing rapidly in Japan in recent years. Facebook, mixi and twitter are the popular one. In particular, the number of users is increasing year by year and it has reached 328 million users at the point of September 2017.These are utilized in various field of life together with the convenient tool such as smart-phone. Twitter is well used in the marketing activities of each company. They carry out campaign through SNS, which become very popular in Japan. It is reported that many companies have improved corporate performance by utilizing SNS. In this paper, principal component analysis and cluster analysis are executed in order to clarify the relationship among the corporate performance and the SNS utilization condition. We focus on restaurant industry and convenience store industry, where marketing competition which utilizes SNS to consumers is fierce. Marketing application would then be extracted. Reviewing past researches, there are some related papers, but they do not handle these analysis techniques. Moreover there have been few researches made on our theme stated above. Some interesting results were obtained.

Reviewing past researches, Sako et al. (2013) devised the system to identify the user's sex by extracting characteristics from the tweet big data through using Support Vector Machine. Kadowaki et al. (2014) proposed the method to inquire recipe which fit to the user by the analysis of twitter text. Tamai et al. (2016) estimated the degree of depression from the tweet data.

There are many related papers concerning twitter but there are few papers which analyze the correlation between twitter related data and corporate performance by using principal component analysis and/or cluster analysis.

The rest of the paper is organized as follows. Principal component analysis is executed in section 2. Cluster analysis is carried out in section 3, which is followed by the Remarks of section 4.

2. Principal Component Analysis

The analysis data for restaurant industry and convenience industry is attached in Appendix. Most of the big and famous companies are covered. Principal component analysis is executed on these data. Analysis results are as follows. Eigen value and cumulative hitting ratio are exhibited in Table 1.

Table 1. Eigen value and Cumulative hitting ratio

Component	Eigen value	Cumulative hitting ratio %
1	7.542	44.364
2	2.600	59.657
3	2.051	71.724
4	1.674	81.569
5	.930	87.040
6	.835	91.952
7	.597	95.462
8	.321	97.352
9	.271	98.944
10	.084	99.438
11	.057	99.771
12	.018	99.877
13	.010	99.937
14	.009	99.989
15	.001	99.996
16	.001	100.000
17	.000004325	100.000

Cumulative hitting ratio of the 1st principal component is 44.364％ and cumulative hitting ratio up to the 2nd principal component is 59.657％, 3rd principal component is 71.724％ 4th is 81.569％. i.e., nearly60 % of the data is explained by up to the 2nd principal component and over 80 % of the data is explained by up to the 4th principal component.

Next, factor loading matrix is exhibited in Table 2. In this Table, up to 4th principal component is exhibited.

Table 2. Factor Loading Matrix

	Factor 1	Factor 2	Factor 3	Factor 4
Total assets	.916	.167	-.312	-.001
Net Income	.890	.199	-.326	.058
Operating Income	.875	.183	-.364	.027
Ordinary income	.873	.183	-.375	.024
Number of stores	.828	.075	-.146	-.078
Number of tweets	.802	.058	.358	-.402
twitter followers	.791	.537	.035	-.017
replies	.723	-.266	.336	.409
amount of sales	.708	.248	.424	-.106
user mentions	.640	-.309	.346	.375
Number of twitter follow	.628	.017	.565	-.443
retweets	-.306	.756	-.088	.085
tweets retweeted	-.495	.692	.062	-.283
tweets favorited	-.496	.672	.060	-.223
links	-.009	.018	.696	-.223
hashtags	-.089	.355	.337	.690
Number of likes	-.075	.558	.282	.567

Next, plot chart is exhibited in Figure 1 where X axis is the 1st principal component and Y axis is the 2nd principal component.

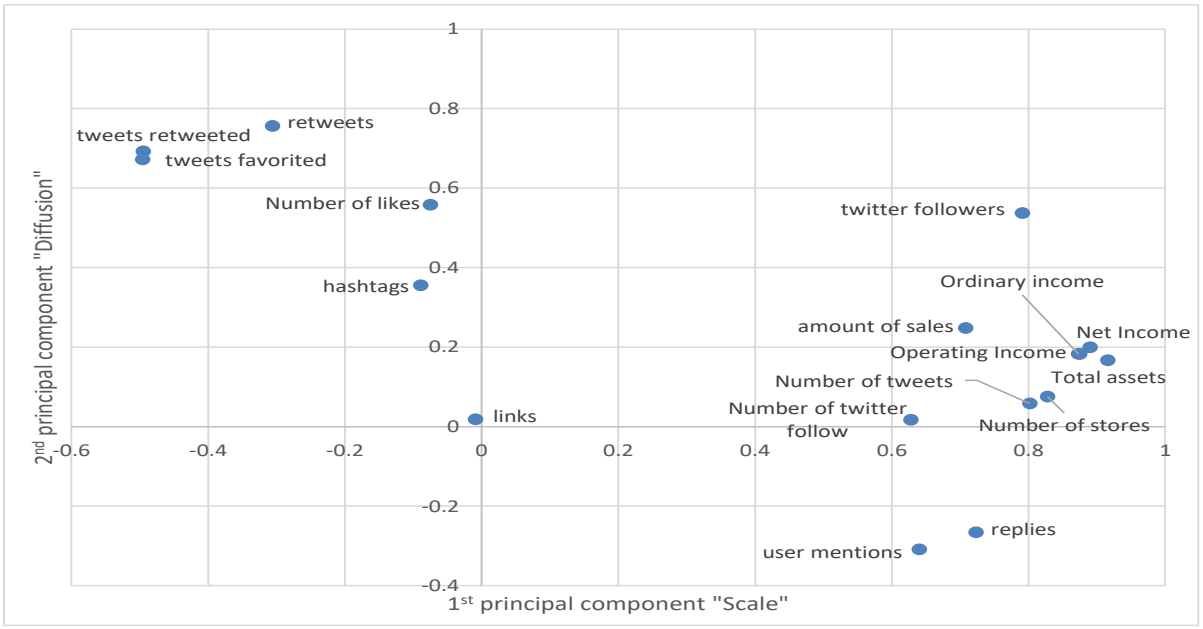

Figure 1. Plot chart of 1st principal component and 2nd principal component

The 1st principal component shows scale, corporate performance, number of tweets, number of followers etc., which means “Scale”. The 2nd principal component has a large value at retweets, tweets retweeted, tweets favorited, which implies “Diffusion”.

Next, plot chart is exhibited in Figure 2 for the 3rd principal component (X axis) and the 4th principal component (Y axis).

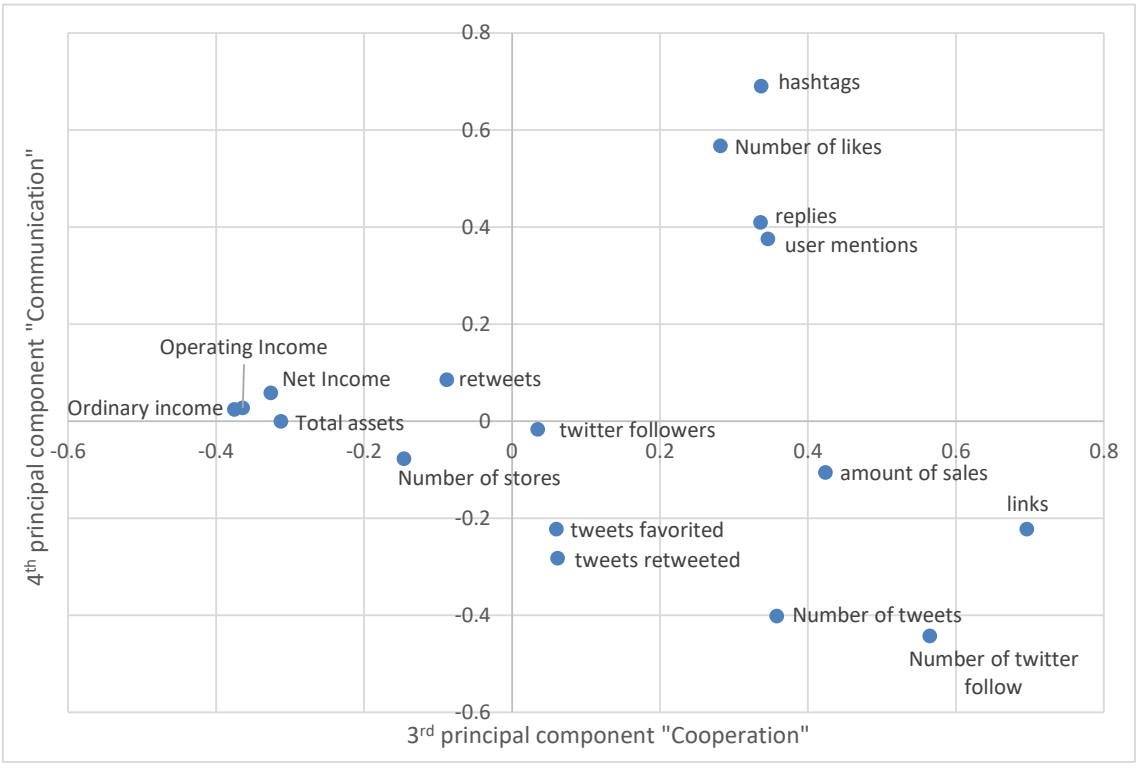

Figure 2. Plot chart of 3rd principal component and 4th principal component

Y The 3rd principal component has a large value at links, number of followers etc., which means “Cooperation”. The 4th principal component shows hashtags, number of likes, replies etc., which implies “Communication”.

Now, the score for each company is exhibited in Table 3 where up to 4th principal component are shown.

Table 3. Score for each company

Company Name	Factor 1	Factor 2	Factor 3	Factor 4
Lawson	2.42283	0.14188	2.37471	-1.97311
Seven & i Holdings	2.80948	0.82845	-2.48136	0.54066
FamilyMart	1.07412	-0.63105	-0.27529	-0.12329
KFC Holdings Japan	0.08515	-0.47491	1.64471	2.21423
ANRAKUTEI	-0.48214	-0.53992	-0.34107	-0.26968
Plenus (Hotto Motto)	-0.36807	0.31295	0.17732	-0.21455
B-R 31 ICE CREAM	-0.06776	-1.35694	0.71867	0.37918
MINISTOP	-0.4068	0.82209	0.65113	-0.56251
McDonald’s Holdings Company (Japan)	-0.45266	3.11114	0.31551	1.00773
SKYLARK (GUSTO)	0.56741	-0.49616	0.55266	2.20142
KURA Corporation	-0.70145	0.76172	0.2195	-0.87386
KAPPA CREATE	-0.58062	-0.65942	0.14445	-0.9163
MOS FOOD SERVICES	-0.69925	0.83189	-0.25741	-1.04256
Torikizoku	-0.14886	-1.18067	-0.14184	0.33088
CHIKARANOMOTO GLOBAL HOLDINGS (IPPUDO)	-0.68238	0.65007	0.15277	0.52569
RINGER HUT	-0.55311	-0.17269	-0.17231	-0.18492
KOURAKUEN HOLDINGS	-0.62458	-0.20648	-0.70228	-0.30892
HOTLAND (Tsukiji Gindako)	-0.55063	-0.21304	-0.84945	-0.02372
AKINDO SUSHIRO	-0.30514	-0.64715	-0.7976	-0.36096
TORIDOLL (MARUKAME UDON)	-0.33556	-0.88177	-0.93282	-0.34543

Next, plot chart is exhibited in Figure 3 (The 1st principal component for X axis and the 2nd principal component for Y axis).

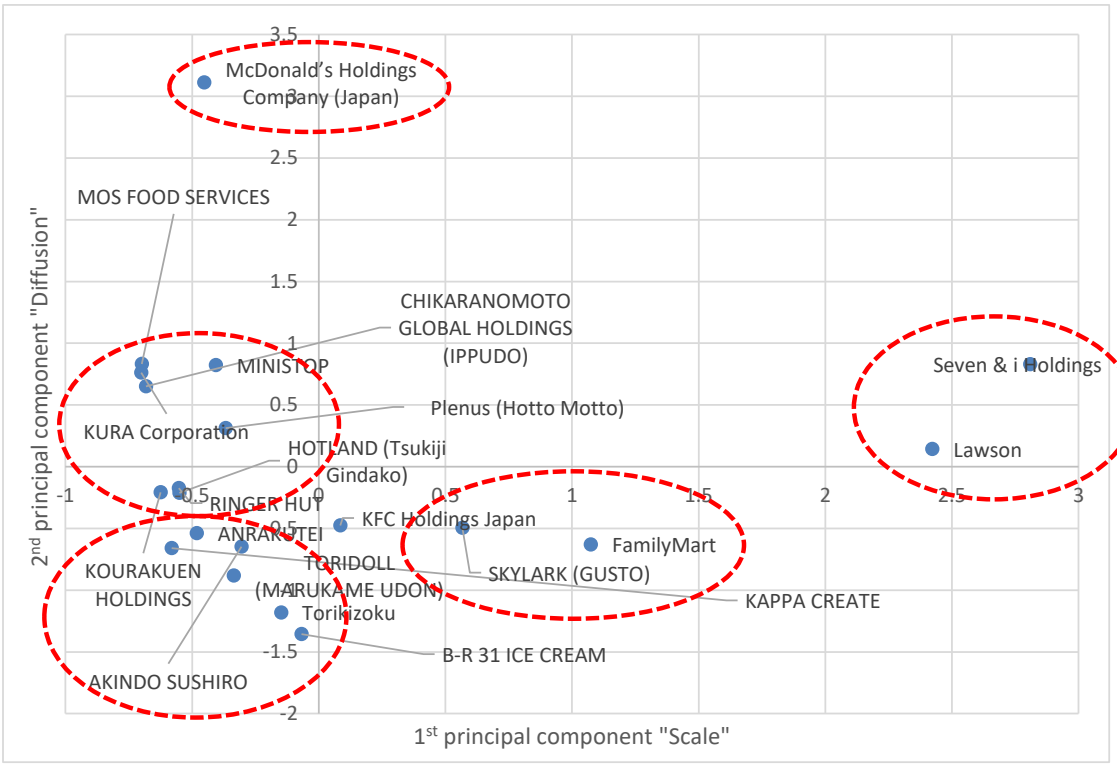

Figure 3. Plot chart (The 1st principal component for X axis and the 2nd principal component for Y axis)

We can observe the following 5 big clusters.

Right: Seven & i Holdings, Lawson

This is a high corporate performance, high frequency SNS utilization group.

Left Upper: McDonald’s Holdings Company (Japan)

This is a single group. It is strong for retweets group. It makes many campaign and has good communication with consumers.

Lower Right: KFC Holdings Japan, SKYLARK (GUSTO), FamilyMart

This cluster has the characteristics that corporate performance and scale are rather big and retweets group are slightly low.

Left: MOS FOOD SERVICES, KURA Corporation, Plenus (Hotto Motto), MINISTOP

MOS FOOD SERVICES carries out the campaign, where the rival is McDonald. But it does not make so much hit as McDonald in the number of retweets.

Lower Left: ANRAKUTEI, Torikizoku, KAPPA CREATE, RINGER HUT, B-R 31 ICE CREAM, KOURAKUEN HOLDINGS, Torikizoku

Scale is rather small and the number of tweets is rather few. They do not make so much effort to SNS or it does not make so much hit.

Next, plot chart is exhibited in Figure 4 where the 3rd principal component is located at X axis and the 4th principal component is placed at Y axis.

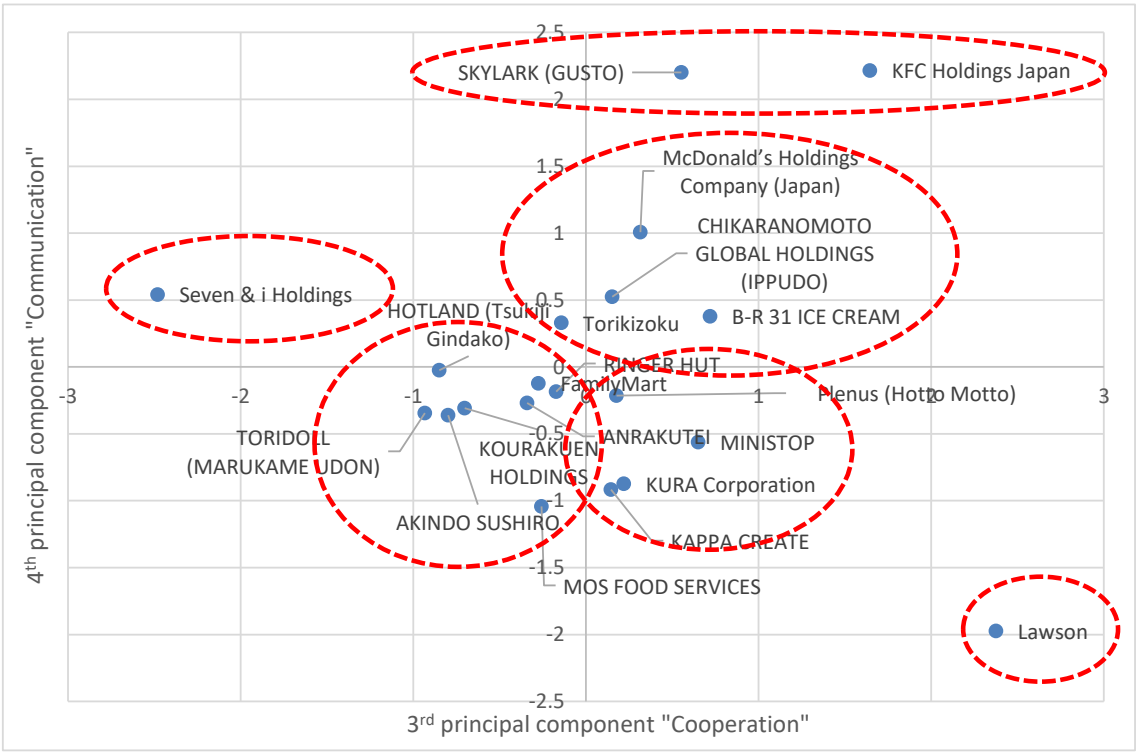

Figure 4. Plot chart (the 3rd principal component is located at X axis and the 4th principal component is placed at Y axis)

We can observe the following 6 clusters.

Upper Right: KFC Holdings Japan, SKYLARK (GUSTO)

Although the number of retweets is slightly small, there are many reply from the company. Therefore it is regarded as a high communication group.

Lower Right: Lawson

It has many followers and links but communication level is low.

Center Upper Right: McDonald's Holdings Company (Japan), B-R 31 ICE CREAM, Torikizoku

Communication and the number of followers are rather high. It can be said that they make effort to a certain degree.

Center Right Lower: MINISTOP, KAPPA CREATE, KURA Corporation

They have certain number of followers but communication level is low.

Center Left Lower: KOURAKUEN HOLDINGS, AKINDO SUSHIRO, MOS FOOD SERVICES, ANRAKUTEI

It is in the low level communication and the number of followers is in the low level. It can be said that it is a low active group in SNS.

Thus we could obtain fruitful results by utilizing principal component analysis.

3. Cluster Analysis

Cluster analysis is executed in order to confirm the relationship/closeness among companies. The data used are the same with those of principal component analysis. First of all, cluster cohesion process is exhibited in Table 4.

Table 1. Cluster Cohesion Process

	Combined Cluster			First stage of cluster		
Steps	Cluster 1	Cluster 2	Coefficient	Cluster 1	Cluster 2	Next step
1	21	24	.235	0	0	9
2	18	19	1.326	0	0	7
3	8	10	2.625	0	0	6
4	13	15	4.287	0	0	6
5	5	16	6.672	0	0	10
6	8	13	10.094	3	4	14
7	17	18	13.579	0	2	8
8	17	20	18.941	7	0	11
9	14	21	24.791	0	1	11
10	5	9	31.222	5	0	12
11	14	17	39.106	9	8	12
12	5	14	52.321	10	11	14
13	4	12	67.046	0	0	15
14	5	8	87.763	12	6	17
15	3	4	108.636	0	13	18
16	1	2	144.735	0	0	19
17	5	11	181.154	14	0	18
18	3	5	223.698	15	17	19
19	1	3	360.349	16	18	0

Distance is calculated by using Euclidean square distance. Dendrogram by Ward method is exhibited in Figure 5.

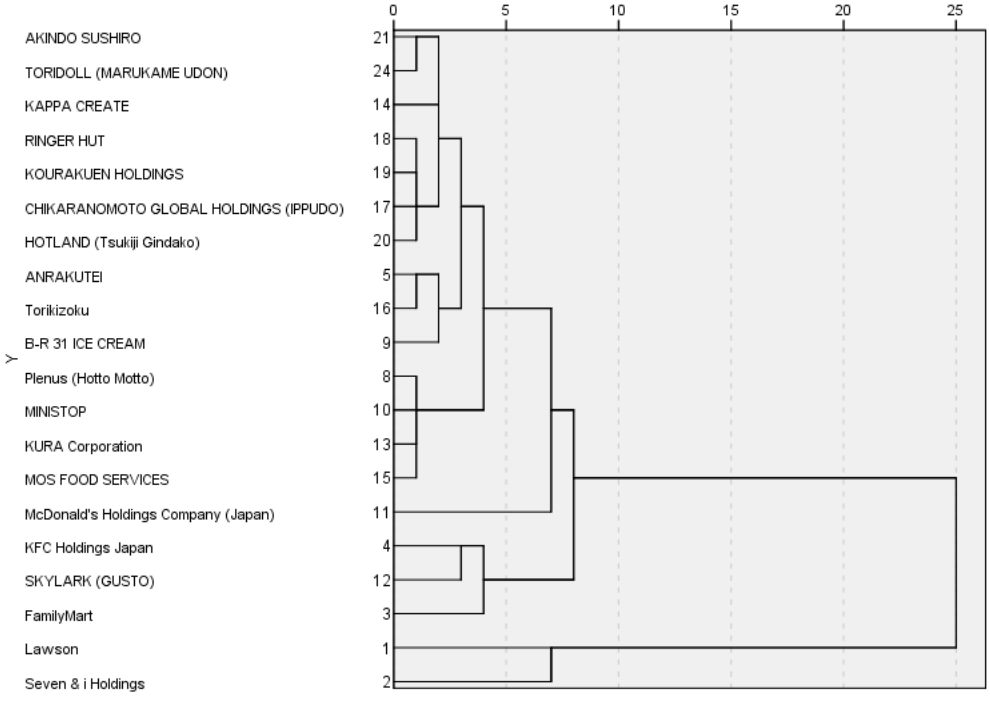

Figure 5. Dendrogram by Ward method

Watching carefully in detail, we could find astonishing results. In the principal component analysis for the 1st principal component and the 2nd principal component, we could observe 5 big clusters. Cluster analysis wholly coincided with these results.

The group of AKINDO SUSHIRO ~ B-R 31 ICE CREAM is the same with those of Lower Left in Figure 3.

The group of Plenus (Hotto Motto) ~ MOS FOOD SERVICES is the same with those of Left Center in Figure 3.

McDonald's Holdings Company (Japan) corresponds to Left Upper in Figure 3.

KFC Holdings Japan ~ FamilyMart group is the same with those of Lower Right in Figure 3.

Lawson, Seven & i Holdings is located right in Figure 3.

Examining it more in detail, we could find that the classification by Cluster analysis corresponds to the positive part of 1st principal component, negative part of 1st principal component, positive part of 2nd principal component and negative part of 2nd principal component. If we indicate large positive part of 1st principal component as ++, and small one as +, then the expression by the combination of (1st principal component, 2nd principal component) become as follows.

AKINDO SUSHIRO ~ B-R 31 ICE CREAM: Lower Left in Figure 3 (－,－)

Plenus (Hotto Motto) ~ MOS FOOD SERVICES: Left Center in Figure 3 (－,+)

McDonald's Holdings Company (Japan): Left Upper in Figure 3 (－,++)

KFC Holdings Japan ~ FamilyMart: Lower Right in Figure 3 (+,－)

Lawson, Seven & i Holdings: Right in Figure 3 (++,+)

Lower two groups consist of positive part of 1st principal component and the upper groups consist of negative part of 1st principal component.

Each group of positive and negative part of 2nd principal component is built by dividing the above big group. These are expressed in Figure 6.

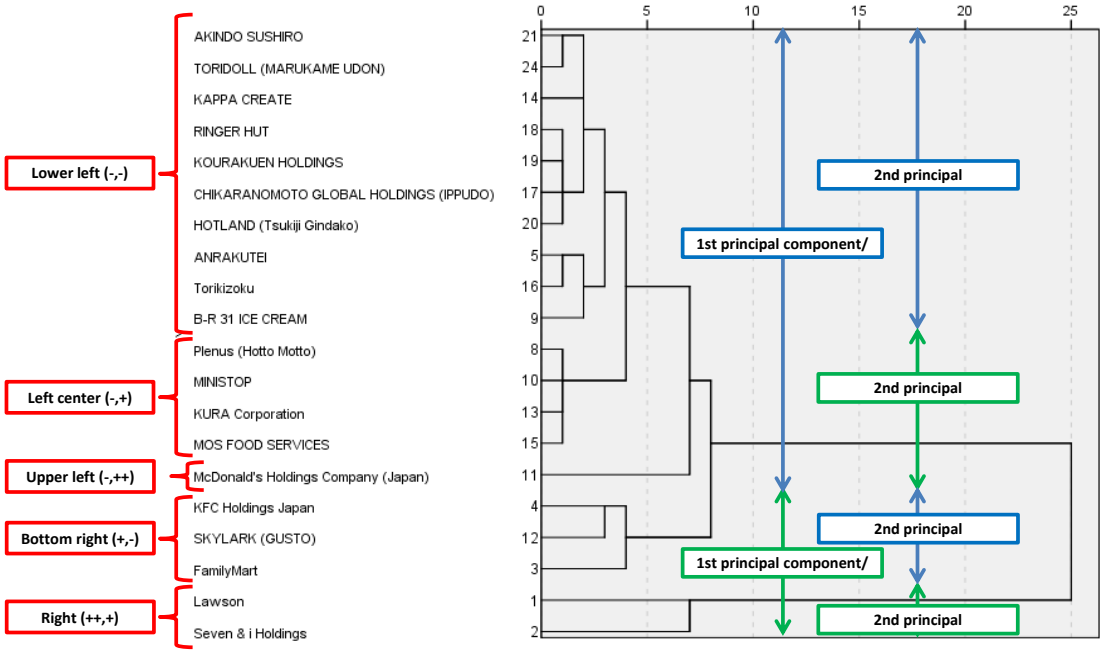

Figure 6. Divided groups by Principal Component Analysis and Cluster Analysis

Principal Component Analysis has much more information than Cluster Analysis because Principal Component Analysis has the information of distance in the plotting plane. Principal Component Analysis and Cluster Analysis are not used at the same time so far, because the method and the objective of using it is quite different. But we have obtained marvelous results as stated above. This relationship should be examined in various cases.

4. Remarks

4.1 Convenience Store Industry

We have obtained the result that Seven & i Holdings and Lawson are in the high corporate performance, high frequency SNS utilization group. They have twitter followers for more than 2 million consumers and are distinct from other companies.

MINISTOP has rather small 380 thousand followers but the number of likes is 2811 which is the most in the convenience store industry. Total retweet is 966527 which is also the most in the convenience store industry. MINISTOP maybe makes some device for the consumers to retweet. Looking into the retweet in detail, MINISTOP makes tweet that if the consumers make follow and retweet, consumers can get coupon by lottery. Thus, many consumers make retweet.

4.2 Restaurant Industry

From Figure 3, we can observe that McDonald is overwhelming in retweet theme. The example of McDonald's campaign to stimulate retweet is as follows.

If consumers follow McDonald's account (@McDonalds Japan) and retweet the tweet which is to be executed on 20 o'clock May 23, 5 persons are selected by lottery and "Suitable burger" are given for the number of followers.

From Figure 4, we can observe that KFC Holdings Japan is in a high communication group. Followers are 540 thousand, which is 1/4 compared with McDonald, but the number of tweet is 240 thousand, which is 30 times, and the number of follow is 6 thousand, which is 15 times, and the number of replies 3 thousand, which is 30 times compare with McDonald. KFC Holdings Japan is making device as follows.

Consumers can get KFC's LINE stamp by free of charge only by making follow even if the consumers do not retweet.

Thus each company is making every effort to sharpen swords.

5. Conclusion

Social Networking Service (SNS) is prevailing rapidly in Japan in recent years. Facebook, mixi and Twitter are the popular one. These are utilized in various field of life together with the convenient tool such as smart-phone. In this paper, principal component analysis and cluster analysis are executed in order to clarify the relationship among the corporate performance and the SNS utilization condition. We focus on restaurant industry and convenience store industry, where marketing competition which utilizes SNS to consumers is fierce. Marketing application would then be extracted.

The main results of principal component analysis are as follows.

In the chart of the 1st principal component (X axis) and the 2nd principal component (Y axis), we can observe the following 5 big clusters.

Right: Seven & i Holdings, Lawson

This is a high corporate performance, high frequency SNS utilization group.

Left Upper: McDonald's Holdings Company (Japan)

This is a single group. It is strong for retweets group. It makes many campaign and has good communication with consumers.

Lower Right: KFC Holdings Japan, SKYLARK (GUSTO), FamilyMart

This cluster has the characteristics that corporate performance and scale are rather big and retweets group are slightly low.

Left: MOS FOOD SERVICES, KURACorporation, Plenus (Hotto Motto), MINISTOP

MOS FOOD SERVICES carries out the campaign, where the rival is McDonald. But it does not make so much hit as McDonald in the number of retweets.

Lower Left: ANRAKUTEI, Torikizoku, KAPPA CREATE, RINGER HUT, B-R 31 ICE CREAM, KOURAKUEN HOLDINGS, Torikizoku

Scale is rather small and the number of tweets is rather few. They do not make so much effort to SNS or it does not make so much hit.

Cluster analysis was executed in order to confirm the relationship/closeness among companies. The data used were the same with those of principal component analysis.

In the principal component analysis for the 1st principal component and the 2nd principal component, we could observe 5 big clusters as stated above. Cluster analysis wholly coincided with these results. This is really an astonishing result. Principal Component Analysis and Cluster Analysis are not used at the same time so far, because the method and the objective of using it is quite different. But we have obtained marvelous results as stated above. This relationship should be examined in various cases.

These are utilized for constructing a much more effective and useful marketing plan building for SNS. Although it has a limitation that it is restricted in the number of research, we could obtain the fruitful results. To confirm the findings by utilizing the new consecutive records would be the future works to be investigated.

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Appendix

Name of enterprise	Financial	Number of employees	Amount of sales	Per-store sales figures	Operating Income	Ordinary income
Lawson	consolidated	5446	583,452,000,000	44,500,953	72,541,000,000	69,622,000,000
Seven & i Holdings	individual	440	217,860,000,000	11,217,176	194,297,000,000	193,329,000,000
Family Mart	individual	5638	175,203,000,000	7,151,143	23,183,000,000	26,791,000,000
KFC Holdings Japan	consolidated	4602	88,032,000,000	76,616,188	2,558,000,000	2,425,000,000
ANRAKUTEI	consolidated	99,999,999	15272000000	99,999,999	22,000,000	243,000,000
YOSHINOYA CO.,LTD	individual	173	56,565,000,000	46,864,126	281,000,000	344,000,000
Duskin Co., Ltd.(Mister Donut)	individual	3667	134,245,000,000	115,728,448	4,069,000,000	6,478,000,000
Plenus (Hotto Motto)	individual	9361	138,282,000,000	51,966,178	6,938,000,000	7,590,000,000
B-R 31 ICE CREAM	individual	333	19,706,000,000	16,714,165	486,000,000	557,000,000
MINISTOP	consolidated	896	196,955,000,000	87,032,700	1,241,000,000	2,284,000,000
McDonald's Holdings Company (Japan)	consolidated	99,999,999	226,646,000,000	77,858,468	6,930,000,000	6,614,000,000
SKYLARK (GUSTO)	consolidated	99,999,999	354,513,000,000	115,551,825	31,249,000,000	28,952,000,000
KURACorporation	consolidated	10270	110949000000	288,179,221	6519000000	6802000000
KAPPA CREATE	consolidated	112	66257000000	188,766,382	-668000000	-522000000
MOS FOOD SERVICES	consolidated	1035	52,346,000,000	38,433,186	3,823,000,000	4,090,000,000
Torikizoku	consolidated	99,999,999	29336000000	59,626,016	1,457,000,000	1,426,000,000
CHIKARANOMOTO GLOBAL HOLDINGS (IPI	consolidated	99,999,999	1,983,000,000	14,909,774	289,000,000	281,000,000
RINGER HUT	consolidated	659	20,104,000,000	31,217,391	1,648,000,000	2,520,000,000
KOURAKUEN HOLDINGS	consolidated	4649	14,423,000,000	26,512,868	1,004,000,000	1,362,000,000
HOTLAND (Tsukiji Gindako)	consolidated	99,999,999	26,536,000,000	39,903,759	1,492,000,000	1,416,000,000
AKINDO SUSHIRO	individual	99,999,999	156402000000	353,850,679	9204000000	8995000000
Pepper Food Service Co., Ltd.	individual	365	22337000000	82,121,324	99,999,999	1033000000
COCO'S JAPAN CO.	individual	6219	58,532,000,000	100,226,027	99,999,999	2,481,000,000
TORIDOLL (MARUKAME UDON)	individual	9379	89,611,000,000	102,179,019	9,886,000,000	9,498,000,000
Ohsho Food Service Corporation	individual	8138	75,078,000,000	104,711,297	5,494,000,000	5,801,000,000

The ordinary profit rate (sales)	Net Income	Net income per share	Total assets	Net assets per share	Sales volume per person	Net income per person
11.93%	31,381,000,000	313.81	803,212,000,000	2,643.97	107,134,043.33	5,762,210.80
88.74%	73,558,000,000	83.18	1,845,861,000,000	1,670.18	495,136,363.64	167,177,272.73
15.29%	10,519,000,000	95.03	918,059,000,000	3,929.84	31,075,381.34	1,865,732.53
2.75%	1,365,000,000	60.9	39,484,000,000	944.43	19,129,074.32	296,610.17
1.59%	25,000,000	11.92	13,556,000,000	2594.16	99,999,999	99,999,999
0.61%	1,500,000,000	23.25	84,713,000,000	791.05	326,965,317.92	8,670,520.23
4.83%	3,723,000,000	68.09	99,999,999	99,999,999	36,608,944.64	1,015,271.34
5.49%	4,221,000,000	110.27	91,351,000,000	1,711.27	14,772,139.73	450,913.36
2.83%	175,000,000	18.2	18,364,000,000	995.02	59,177,177.18	525,525.53
1.16%	215,000,000	7.43	121,395,000,000	1,970.28	219,815,848.21	239,955.36
2.92%	5,366,000,000	40.37	180,499,000,000	827.32	99,999,999	99,999,999
8.17%	18,213,000,000	93.57	318,317,000,000	586.13	99,999,999	99,999,999
6.13%	4389000000	222.31	46112000000	1533.41	10,803,213.24	427,361.25
-0.79%	-6304000000	-129.63	27,687,000,000	228.22	591,580,357.14	-56,285,714.29
7.81%	2,358,000,000	75.72	55,063,000,000	1,359.84	50,575,845.41	2,278,260.87
	967000000	83.55	15942000000	546.58	293.36	9.67
14.17%	242,000,000	23.48	6,690,000,000	317.55	99,999,999	99,999,999
12.53%	1,592,000,000	71.98	30,721,000,000	678.8	30,506,828.53	2,415,781.49
9.44%	963,000,000	61.8	21,393,000,000	533.58	3,102,387.61	207,141.32
5.34%	-751,000,000	-40.97	14,816,000,000	213.28	99,999,999	99,999,999
5.75%	6952000000	253.16	125562000000	1145.36	99,999,999	99,999,999
4.62%	633000000	64.7	99,999,999	99,999,999	99,999,999	99,999,999
4.24%	1,450,000,000	85.46	99,999,999	99,999,999	9,411,802.54	233,156.46
10.60%	5,467,000,000	126.48	53,601,000,000	652.34	9,554,430.11	582,897.96
7.73%	3,839,000,000	203.92	64,727,000,000	2,341.11	9,225,608.26	471,737.53

Name of enterprise	Number of follow	twitter followers	Number of likes	Number of stores	tweets from June 08, 2015 to December 12, 2017	tweets per day
Lawson	199,294	2441721	143	13111	3200	139.13
Seven & i Holdings	8,432	2,759,992	2,637	19,422	3,200	60.38
Family Mart	52323	837001	19	24500	3200	22.54
KFC Holdings Japan	6054	542301	15302	1149	3200	114.29
ANRAKUTEI	5594	7512	456	224	3196	3.41
YOSHINOYA CO.,LTD	99,999,999	95418	176	1207	3200	4
Duskin Co., Ltd.(Mister Donut)	150712	636831	6531	1160	3200	4.65
Plenus (Hotto Motto)	12725	44979	533	2661	3167	2
B-R 31 ICE CREAM	34	144563	614	1179	3200	13.91
MINISTOP	41527	377785	2811	2263	3198	1.78
McDonald's Holdings Company (Japan)	391	2191058	16567	2911	3146	7.42
SKYLARK (GUSTO)	13369	178783	62	3068	3200	22.38
KURACorporation	4543	49115	334	385	3193	2.01
KAPPA CREATE	1713	19820	128	351	3200	2.1
MOS FOOD SERVICES	3	381175	135	1362	3130	1.21
Torikizoku	17122	21011	227	492	3199	1.29
CHIKARANOMOTO GLOBAL HOLDINGS (IPI	6055	9221	8615	133	2759	1.65
RINGER HUT	30	15868	17	644	2513	1.04
KOURAKUEN HOLDINGS	2364	4158	1177	544	1273	1.39
HOTLAND (Tsukiji Gindako)	45	2500	31	665	1156	2.9
AKINDO SUSHIRO	8	63334	201	442	414	0.34
Pepper Food Service Co., Ltd.	215	3983	46	272	331	0.51
COCO'S JAPAN CO.	99,999,999	7312	99,999,999	584	215	0.31
TORIDOLL (MARUKAME UDON)	10	34477	2	877	162	0.88
Ohsho Food Service Corporation	99,999,999	4465	99,999,999	717	143	0.42

retweets	user mentions	replies	links	hashtags	tweets retweeted	a total of tweets retweeted times	tweets favorited	a total of tweets favorited times	average annual income	mean age
28	3026	3063	3173	203	126	227040	179	236643	6494713	39.1
60	2713	2959	128	130	210	528215	229	403026	7212959	44.1
27	2409	2760	211	278	294	218907	300	361695	6,392,608	37.9
0	3130	3159	3196	3195	62	6945	85	15976	4,703,000	35.9
24	2416	83	402	83	811	1999	1675	4590		
22	2035	2127	496	1100	1145	137919	2046	189092	6420000	46.8
12	1231	1338	1058	576	2046	468267	2722	1100512	7827203	43.2
208	1507	1136	1392	1665	1855	41268	1729	28095	5281000	36.0
3	2722	3036	3113	9	153	111255	371	179378	7502602	40.5
99	1396	896	1497	1830	2404	966527	2572	331029	5533000	38.8
897	101	88	872	3790	2249	8457135	2249	6197823		
29	2989	3084	28	6505	116	586574	113	75170		
163	36	26	2699	1972	2471	101716	2087	144534	4310952	28.9
0	0	0	3155	9	962	7000	426	10057	5584948	37.5
340	350	356	1720	197	2546	240978	2131	242759	6677244	40.3
9	2561	2237	61	2	404	12777	597	12418		
270	870	868	1107	2335	1547	41708	1831	38900		
185	866	466	1523	1512	1274	18471	958	20758	6798693	43.3
187	4	0	340	861	864	4090	919	6605	3724000	31.8
593	387	398	76	397	207	5001	358	10465		
9	4	3	118	389	374	54016	371	39077		
2	73	22	222	170	236	3407	270	6227	5022000	41.4
0	1	1	111	335	215	73326	215	61504	5330448	37.8
4	16	4	55	74	158	22002	158	29827	5326000	34.5
18	52	59	38	51	75	1711	105	3576	4695000	30.6

※Missing data is set to 99,999,999