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ANALYSIS OF E-WORD-OF-MOUTH INFORMATION FOR COSMETIC PRODUCTS IN JAPAN[a]

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ABSTRACT

A methodological approach is proposed to understand the potential importance of e-WOM in e-Marketing. Focusing on the cosmetic product market in Japan, a social network named @COSME is chosen for the study. More specifically, actual blogs concerning skin lotions are collected from @COSME in the period between November 1, 2007 and October 31, 2008. By identifying key words which are used by either manufactures for promoting skin lotions on the Internet or consumers in their blogs, it is examined how such key words would overlap each other, thereby providing a basis to establish effective e-marketing strategies in e-WOM communications.

Keywords: Japanese Cosmetics Market, e-WOM (Word of Mouth), Blogs, e-Marketing

[a] Remark: This paper has been rewritten by improving an earlier version which was registered as a discussion paper at University of Tsukuba with URL http://www.sk.tsukuba.ac.jp/SSM/libraries/pdf1251/1253.pdf and was presented at 2010 International Conference on e-commerce, e-Administration, e-Society, e-Education, and e-Technology, January 25-27, 2010, Macau.

1. INTRODUCTION

During the past decade, the Internet has impacted the way marketing is conducted substantially. Before the Internet, the emphasis was on the mass marketing through TV, radio, newspapers, journals and other media directed one way from the media to customers, whereas the one-to-one marketing was laborious, time-consuming and costly, and could be conducted only in a limited way through direct mail, hearings via telephone, interviews at exits of stores and the like. As the use of the Internet has spread rapidly, the importance of e-marketing has become clear, where the mass marketing and the one-to-one marketing can be combined simultaneously with speed and little cost through the Internet.

Along this new trend, CRM (Customer Relationship Management) has become increasingly important, where corporations and customers engage themselves in two way communications and exchange information valuable to each other. In particular, in the midst of new era called WEB2.0, CGM (Consumer Generated Media) has been drawing much attention of practitioners and researchers where information exchanged among consumers through social networks would affect each other significantly and play a vital role in e-marketing. Such exchange of information among indefinite consumers through the Internet is called e-WOM (Word of Mouth), and those consumers who are involved in e-WOM are referred to as bloggers.

The study of WOM outside the Internet can be traced back to the middle of 1990`s, represented by a paper by Ellison and Fudenberg[1] which proposed a WOM model and analyzed its implications. Bone[2] discussed how WOM affected purchasing decisions of consumers, while Goldenberg, Libai and Muller[3] found that the effects of WOM would depend on the level of closeness of those involved in WOM. More recently, a new model was proposed in Banerjee and Fudenberg[4] for measuring the effects of WOM. Along with this line of research on offline WOM, e-WOM began to attract more attention of researchers. An information filtering algorithm was proposed in Shardanand and Maes[5] for identifying preferences of consumers from e-WOM so as to provide personalized recommendations. Stauss[6, 7] examined potential threats and opportunities resulting from online articulations by consumers. Balasubramanian and Mahajan[8] developed a conceptual framework for describing three types of social interaction utilities within a virtual community. Exploiting this framework, Henning-Thurau, Gwinner, Walsh and Gremler[9] studied online samples of some 2000 consumers, identifying key elements for consumers to participate in e-WOM. Dellarocas[10] discussed potentials and difficulties of development of online feedback mechanisms for digitization of e-WOM.

While the above papers shed light into the insight of e-WOM from various perspectives, to the best knowledge of the authors, no research exists in the literature focusing on how interactions of consumers through e-WOM could be utilized for enhancing the effects of e-marketing. The purpose of this paper is to fill this gap by analyzing actual blogs concerning skin lotions collected from a social network named @COSME. At the same time, the descriptions of the products under consideration, written by the manufactures, are also collected from the Internet. Through text-mining, the keywords of frequent use are then extracted from both the blogs and the product descriptions. Furthermore, through extensive interviews with development engineers, such keywords are related to their development intents. The blog keywords are then compared with the product keywords to see how they overlap each other, thereby providing a basis to analyze the perception gap between the manufactures and the consumers, and demonstrating the potential importance of e-WOM in e-marketing.

The structure of this paper is as follows. Section 2 describes the data set to be employed throughout the paper. The basic analysis of the data set is also provided. Key words used by either manufactures for promoting skin lotions on the Internet or consumers in their blogs are identified in Section 3. These key words are categorized in terms of development intention, the content of the key words, engineering difficulty and touch (sense of feel). In Section 4, the collected blog data would be examined through text-mining in order to see how the key words overlap between the product descriptions and the blog data. Some implications of the analysis would be also discussed. Finally, concluding remarks are given in Section 5.

2. DATA DESCRIPTION AND BASIC ANALYSIS

For the study, we first select top ten skin lotions in the popularity ranking of @COSME in year 2008. Table 1 exhibits these ten products with Popularity Ranking, Product ID, Price, Volume (ml), and Price per Volume.

These ten products are categorized into three groups according to their price range as follows, where the number in the parenthesis indicates the popularity ranking.

Low Price Products (Less than￥2000):
KTH001(2), JTW001(7), ESSA001(5), YHMK001(4)
Middle Price Products (￥2000 ~ ￥7000):
KNRM001(9), KAO103(1), KEI001(6),SRE002(8)
High Price Products (More than￥7000):
SICR001(3), PRBB001(10)

Table 1. Ten products selected for the study

Ranking	Product ID	Price(￥)	Volume(ml)	Price per Volume
1	KAO103	5,250	120	43.8
2	KTKH001	1,176	900	1.3
3	SICR001	11,025	170	64.9
4	YHMK001	1,100	400	2.8
5	ESSA001	1,011	230	4.4
6	KEI001	5,250	120	43.8
7	JTW001	609	237	2.6
8	SRE002	6,300	130	48.5
9	KNRM001	2,625	60	43.8
10	PRBB001	21,000	120	175.0

All the blogs at @COSME mentioning at least one of the ten products in Table 1 during the period between November 1, 2007 and October 31, 2008 are collected. There are approximately 3100 such blogs. For each blog, a BPV (Blog Profile Vector) is defined as shown in Table 2. Here, Blog ID uniquely specifies each blog. The product discussed in the blog is indicated by Product ID. Date and Time is to state the time at which the blog is written. User Name describes the nickname of the blogger and Age is the age of the blogger. Skin Type of the blogger is indicated by the blogger.

Attracted Factors is a nine dimensional binary vector, where 1 is entered if the blogger is attracted by the corresponding factor and 0 is entered otherwise. Elements Mentioned is a twelve dimensional binary vector, where 1 is entered if the corresponding element is mentioned in the blog and 0 is entered otherwise. Repeated Use is to indicate whether or not the blogger has repeatedly used the product mentioned in the blog, while Desire to Repeat shows whether or not the blogger intends to use the product repeatedly. Overall Impression describes the general impression of the blogger for the product, and Score is graded by the blogger between 1 through 7.

The collected blog profile vectors are summarized in Table 3 according to each element. One sees that the number of blogs increased by about 50% between the periods November- 07 through April -08 and May 08 through October-08. Concerning Age, the bloggers in 20`s account for about 50%, followed by those in 30`s about 35%. About 40% of the bloggers consider themselves to have Mixed Skin, meaning that they have both Dry Skin and Oily Skin in different parts of their body. The bloggers with Dry Skin account for 26%, followed by those with Sensitive Skin about 16%. The bloggers are largely attracted to skin lotions because of Moist with 66%, Low Stimulus with 43% and Pore and Corneous Care with 26%. The most referenced element in the blogs is Feeling with 91%, followed by Product Quality and Price both with 42%. Only 25% of the bloggers have repeatedly

used the product mentioned in their blogs and about the same portion of the bloggers would use the product repeatedly in the future. Those bloggers who favorably support their products amount to 73%, with only 10% of the bloggers writing negative comments in the blogs. This point is reflected in Score where about 50% of the bloggers grade the score of 5 or higher.

Table 2. Blog profile vector

Index	Contents
Blog ID	
Product ID	
Date	The day when comment was written
Time	Time when comment was written
User Name	The name of the user who wrote comment
Age	The age of the user who wrote comment
Skin Type	1: Ordinary Skin 2: Sensitive Skin 3: Dry Skin 4: Mixed Skin 5: Oily Skin 6: Atopi Skin
Attracted Factors	1: Moist 2: Pore & Corneous Care 3: Acne Care 4: Aging Care 5: Strain 6: Whitening 7: Low Stimulus 8: Unevenness Prevention 9: Sunblock

Index	Contents
Elements Mentioned	1: Recommended via Word of Mouth 2: Advertisement 3: Product Quality 4: Potential Effects 5: Feeling 6: Comparison 7: Favorite Manufacturer 8: Sample 9: Service 10: Smell 11: Design 12: Price
Overall Impression	P: Positive N: Negative Ne: Neutral
Repeated Use	0: No ; 1: Yes
Desire to Repeat	0: Not Mentioning ; 1: No ; 2: Yes
Score	Grading between 1through 7

3. CLASSIFICATION OF KEY WORDS

During the period November 1, 2007 through October 31, 2008, the descriptions of all skin lotions (not limited to the ten products selected) and the blogs concerning the skin lotions are data-mined so as to identify key words. Table 4 provides a list of 28 key words chosen based on the frequency of appearances.

Since Kao Corporation is the only company having two products ranked within the top10 popular skin lotions selected for the study, in particular the very top product, an extensive interview was conducted with development engineers at Kao Corporation11. The interview was organized in a semi-structured manner in order to find out: 1) key elements to be

considered for developing a skin lotion; and 2) how the development engineers assess the twenty eight key words identified above. Concerning the former, the following five factors were mentioned.

Table 3. Summary of blog profile vectors

	# of Blogs	%
Date		
Nov-07	190	6.0
Dec-07	179	5.6
Jan-08	174	5.5
Feb-08	198	6.2
Mar-08	238	7.5
Apr-08	240	7.6
May-08	325	10.2
Jun-08	308	9.7
Jul-08	313	9.9
Aug-08	298	9.4
Sep-08	395	12.4
Oct-08	315	9.9
Total	3173	100.0
Age		
10-14	31	1.0
15-19	207	6.5
20-24	698	22.0
25-29	905	28.5
30-34	801	25.2
35-39	332	10.5
40-44	153	4.8
45 and over	46	1.4
Total	3173	100.0
Skin Type		
1: Ordinary Skin	294	9.3
2: Sensitive Skin	502	15.8
3: Dry Skin	833	26.3
4: Mixed Skin	1250	39.4
5: Oily Skin	217	6.8
6: Atopi skin	77	2.4
Total	3173	100.0
Repeated Use		
0:No	2378	74.9
1:Yes	795	25.1
Total	3173	100.0
Overall Impression		
Ne: Neutral	524	16.5
N: Negative	330	10.4
P: Positive	2319	73.1
Total	3173	100.0

	# of Blogs	%
Score		
0	19	0.6
1	102	3.2
2	137	4.3
3	311	9.8
4	594	18.7
5	858	27.0
6	664	20.9
7	333	10.5
Not Available	155	4.9
Total	3173	100.0
Attracted Points		
1: Moist	2099	30.9
2: Pore & Corneous Care	814	12.0
3: Acne Care	370	5.4
4: Aging Care	519	7.6
5: Strain	648	9.5
6: Whitening	563	8.3
7: Low Stimulus	1372	20.2
8: Unevenness Prevention	406	6.0
9: Sunblock	5	0.1
Total	6796	100.0
Elements Mentioned		
1: Recommended via Word of Mouth	848	9.5
2: Advertisement	15	0.2
3: Product Quality	1333	14.9
4: Potential Effects	488	5.5
5: Feeling	2886	32.3
6: Comparison	378	4.2
7: Favorite Manufacturer	72	0.8
8: Sample	388	4.3
9: Service	138	1.5
10: Smell	934	10.5
11: Design	121	1.4
12: Price	1331	14.9
Total	8932	100.0
Desire for Repeat		
0: Not Mentioning	2208	69.6
1: No	184	5.8
2: Yes	781	24.6
Total	3173	100.0

I. Feeling for the first touch
II. Feeling after several seconds of use
III. Feeling after several minutes of use
IV. Overall feeling after use

V. Special Functions

They then suggested that the key words might be classified into three categories as defined below.

[1] Key words describing the state of the skin
[2] Key words describing the state of the product
[3] Key words describing the function of the product

Consequently, each key word could be labeled as (x, y) with $x \in \{I, II, III, IV, V\}$ and $y \in \{A, B, C\}$, as shown in Table 4. Here, in the last column, BL means that the corresponding key word was selected from the blogs, and PR from the product descriptions. Key words with BOTH were selected from both the blogs and the product descriptions. In Table 5, these key words are rearranged to exhibit the classification based on the (x, y) element.

Table 4 List of key words

No.	Key Word	Type	
1	thickness		B
2	clamminess		B
3	effectiveness for sebaceous trouble	I	C
4	weak acidness		C
5	additive-free		C
6	stickiness	II	B
7	penetration		C
8	glossiness		A
9	elastic softness		A
10	wet softness		A
11	dry softness		A
12	smoothness	III	A
13	coolness		A
14	pleasantness		A
15	smart		A
16	glow		A
17	driness		A
18	youthfulness		A
19	moistness		A
20	freshness		A
21	warming		C
22	conditioning	IV	C
23	texture		A
24	wrinkle		A
25	wet freshness		A
26	whitening		A
27	quasi drug	V	C
28	sensitiveness		A

Note: BL: Blog key word, PR: Product key word, BO: Both

Table 5 Classification of key words

		A: Key words scribing the state of the skin	B:Key words describing the state of the product	C:Key words describing the function of the product
I.	Feeling for the first touch		(1) thickness (2) clamminess	(3) effectiveness for sebaceous trouble (4) weak acidness (5) additive-free
II.	Feeling after several seconds of use		(6) stickiness	(7) penetration
III.	Feeling after several minutes of use	(8) glossiness (9) elastic softness (10) wet softness (11) dry softness (12) smoothness (13) coolness (14) pleasantness (15) smart (16) glow (17) driness		
IV.	Overall feeling after use	(18) youthfulness (19) moistness (20) freshness (23) texture (24) wrinkle (25) wet freshness (26) whitening		(21) warming (22) conditioning
V.	Special Function	(28) sensitiveness		(27) quasi drug

Through the interview (2008), these key words were also ranked along two axes: touch vs. technological difficulty as shown in Figure 1. It can be seen that the following key words [“wet freshness (A, Ⅳ)”, “wet softness (A, Ⅲ)”, “glow (A, Ⅲ)” and “elastic softness (A, Ⅲ)”] seem to be technologically more difficult to achieve than other key words.

4. PRODUCT INTENT AND CONSUMER PERCEPTION

In this section, we examine the blog data through text-mining to see how the key words introduced in Section 3 from the blog data would overlap with those used in the product descriptions. Through this analysis, we investigate to what extent the intents of manufacturers are communicated to consumers.

Using circles to indicate volume and classes of keywords as shown in Figure 2, the results of data-mining for the blog data are summarized in

Figure 3 for low price products, where the number of blogs with reference to each key word is written in a circle representing the approximate size as defined in Figure 2. Figure 3 is re-expressed in a table form in Table 6. The shaded boxes indicate that the higher reference rates of the corresponding key words in blogs are categorized into three classes in three different colors; 10~20% in light green, 20~30% in light orange, and more than 30% in pink. Figures 4 summarizes the histogram of the blogs based on the number of key words in BO, PR, BL, A, B, C, Ⅰ, Ⅱ, Ⅲ, Ⅳ or Ⅴ referenced in a blog. Table 7 recaptures Figure 4 in a table form. The counterparts for Middle Price Products are given in Figure 5, Table 8, Figure 6 and Table 9, and those for High Price Products are exhibited in Figure 7, Table 10, Figure 8 and Table 11.

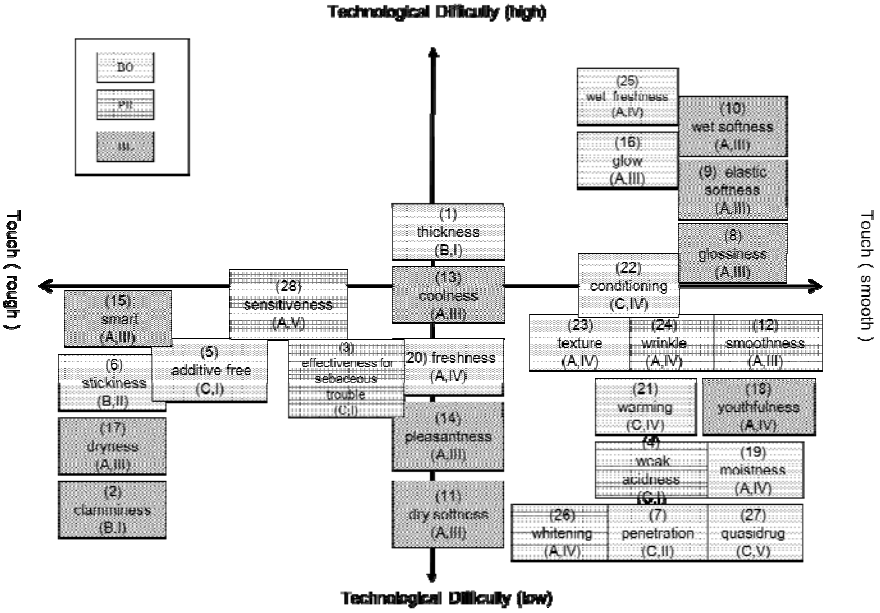


Figure 1. Touch vs. technological difficulty

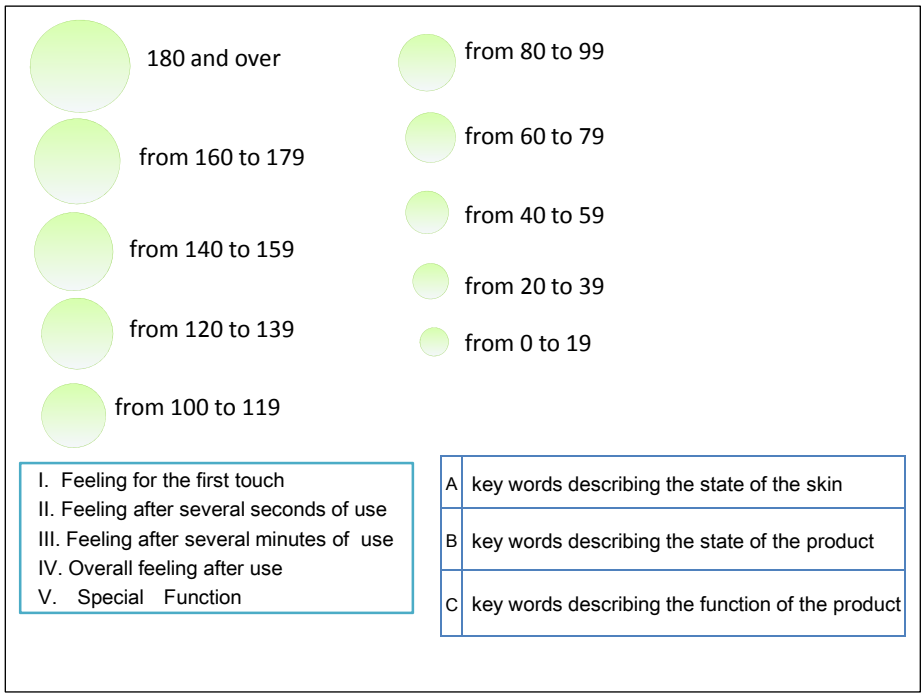


Figure 2. Circles for indicating volume and classification of keywords

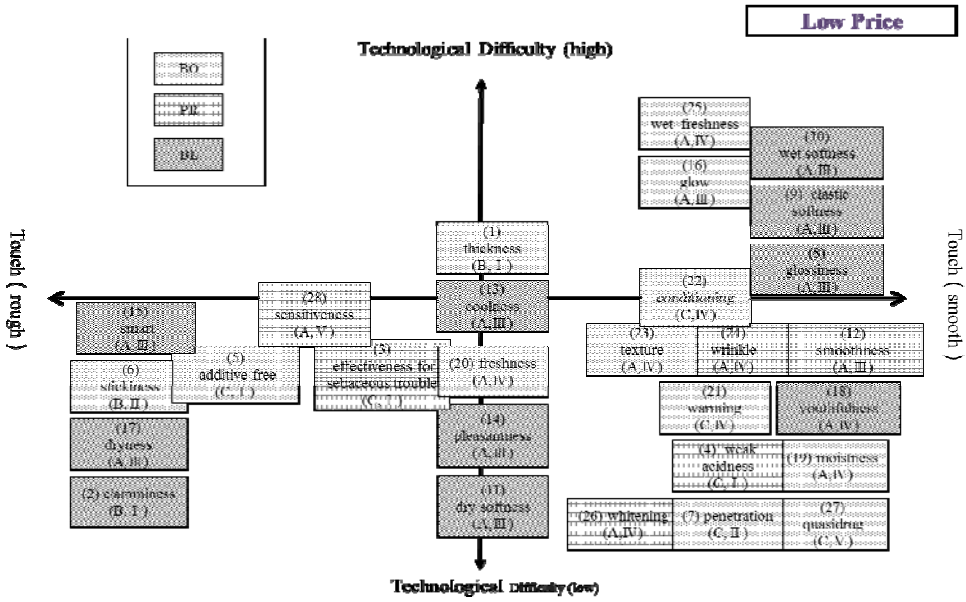
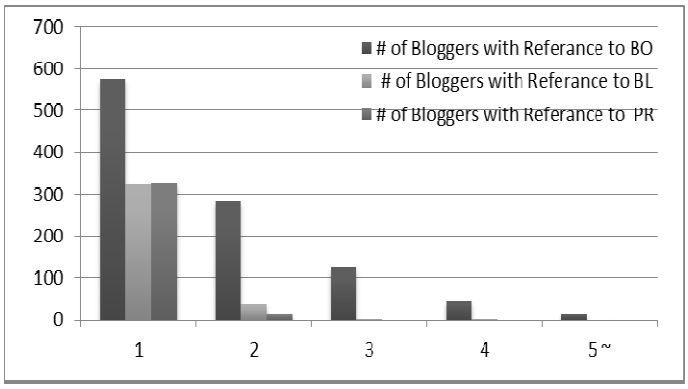


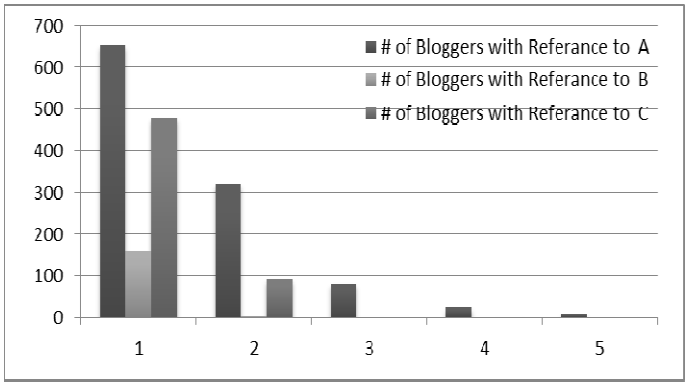
Figure 3. Map of keywords for touch vs. technological difficulty (low price products)

Table 6. Summary of keywords for low price products

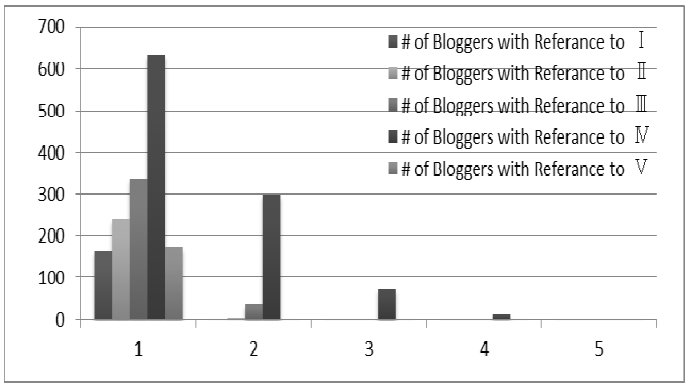
Low Price														
		Ranking/Product ID			2/KTKH001		7/JTW001		5/ESSA001		4/YHMK001		Total	
No.	**Keyword**	Number of blogs			524		279		216		821		1840	
		Type			#	%	#	%	#	%	#	%	#	%
18	youthfulness	BL	A	IV	0	0.00	1	0.36	0	0.00	3	0.37	4	0.22
9	elastic softness	BL	A	III	2	0.38	0	0.00	0	0.00	12	1.46	14	0.76
17	driness	BL	A	III	4	0.76	1	0.36	1	0.46	6	0.73	12	0.65
14	pleasantness	BL	A	III	6	1.15	13	4.66	15	6.94	1	0.12	35	1.90
15	smart	BL	A	III	6	1.15	6	2.15	8	3.70	12	1.46	32	1.74
13	coolness	BL	A	III	9	1.72	13	4.66	10	4.63	0	0.00	32	1.74
11	dry softness	BL	A	III	12	2.29	21	7.53	13	6.02	24	2.92	70	3.80
8	glossiness	BL	A	III	35	6.68	6	2.15	2	0.93	8	0.97	51	2.77
10	wet softness	BL	A	III	40	7.63	1	0.36	0	0.00	105	12.79	146	7.93
2	clamminess	BL	B	I	0	0.00	1	0.36	0	0.00	8	0.97	9	0.49
16	glow	BO	A	III	7	1.34	0	0.00	0	0.00	5	0.61	12	0.65
23	texture	BO	A	IV	38	7.25	1	0.36	0	0.00	10	1.22	49	2.66
19	moistness	BO	A	IV	42	8.02	4	1.43	0	0.00	344	41.90	390	21.02
20	freshness	BO	A	IV	61	11.64	63	22.58	32	14.81	38	4.63	194	10.54
25	wet freshness	BO	A	IV	91	17.37	21	7.53	11	5.09	181	22.05	304	16.52
6	stickiness	BO	B	II	1	0.19	1	0.36	0	0.00	23	2.80	25	1.36
1	thickness	BO	B	I	3	0.57	2	0.72	0	0.00	139	16.93	144	7.83
27	quasi drug	BO	C	V	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
22	conditioning	BO	C	IV	3	0.57	3	1.08	0	0.00	1	0.12	7	0.38
5	additive-free	BO	C	I	12	2.29	0	0.00	1	0.46	3	0.37	16	0.87
7	penetration	BO	C	II	30	5.73	11	3.94	3	1.39	180	21.92	224	12.17
21	warming	BO	C	IV	65	12.40	52	18.64	2	0.93	291	35.44	410	22.28
24	wrinkle	PR	A	IV	1	0.19	1	0.36	0	0.00	3	0.37	5	0.27
12	smoothness	PR	A	III	14	2.67	0	0.00	1	0.46	4	0.49	19	1.03
28	sensitiveness	PR	A	V	18	3.44	7	2.51	6	2.78	141	17.17	172	9.35
26	whitening	PR	A	IV	110	20.99	2	0.72	0	0.00	42	5.12	154	8.37
3	effectiveness for sebaceous trouble	PR	C	I	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
4	weak acidness	PR	C	I	1	0.19	0	0.00	0	0.00	2	0.24	3	0.16



(a) Bloggers with referance to BO, BL, PR



(b) Bloggers with referance to A, B, C



(c) Bloggers with referance to I, II, III, IV, V

Figure 4. Number of keywords used by category (low price products)

Table 7. Number of keywords used by category (low price products)

Low Price	Number of Keywords Used												Total
Class of Bloggers	0	%	1	%	2	%	3	%	4	%	5 ~	%	
Bloggers with Referance to BO	797	43.32	575	31.25	282	15.33	125	6.79	46	2.50	15	0.82	1840
Bloggers with Referance to BL	1476	80.22	326	17.72	36	1.96	1	0.05	1	0.05	0	0.00	1840
Bloggers with Referance to PR	1500	81.52	327	17.77	13	0.71	0	0.00	0	0.00	0	0.00	1840
Bloggers with Referance to A	746	40.54	654	35.54	323	17.55	83	4.51	26	1.41	8	0.43	1840
Bloggers with Referance to B	1675	91.03	161	8.75	4	0.22	0	0.00	0	0.00	0	0.00	1840
Bloggers with Referance to C	1271	69.08	478	25.98	91	4.95	0	0.00	0	0.00	0	0.00	1840
Bloggers with Referance to I	1671	90.82	166	9.02	3	0.16	0	0.00	0	0.00	0	0.00	1840
Bloggers with Referance to II	1595	86.68	241	13.10	4	0.22	0	0.00	0	0.00	0	0.00	1840
Bloggers with Referance to III	1463	79.51	336	18.26	37	2.01	3	0.16	1	0.05	0	0.00	1840
Bloggers with Referance to IV	817	44.40	636	34.57	298	16.20	74	4.02	13	0.71	2	0.11	1840
Bloggers with Referance to V	1668	90.65	172	9.35	0	0.00	0	0.00	0	0.00	0	0.00	1840

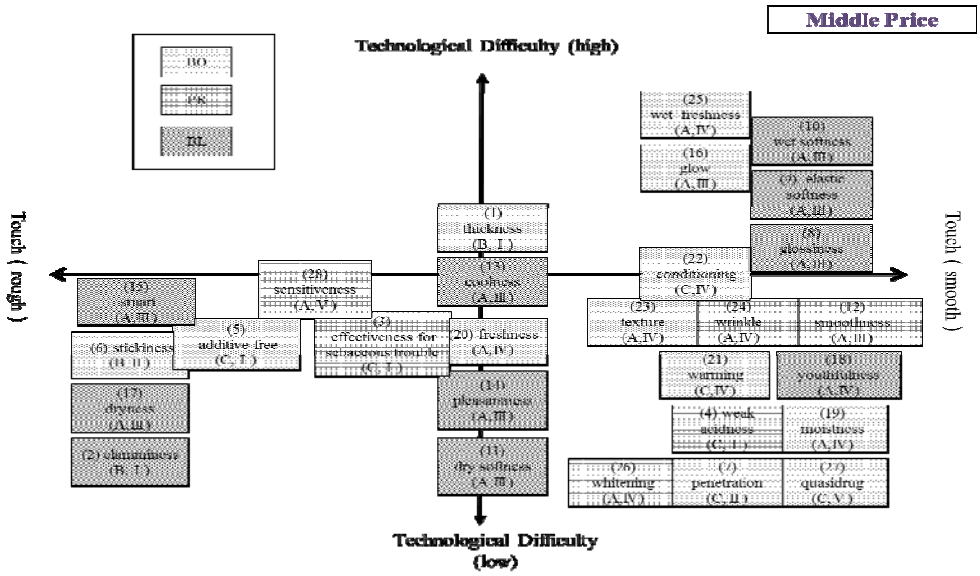
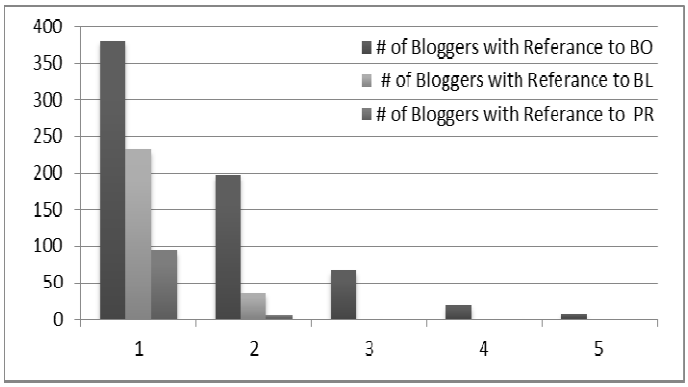


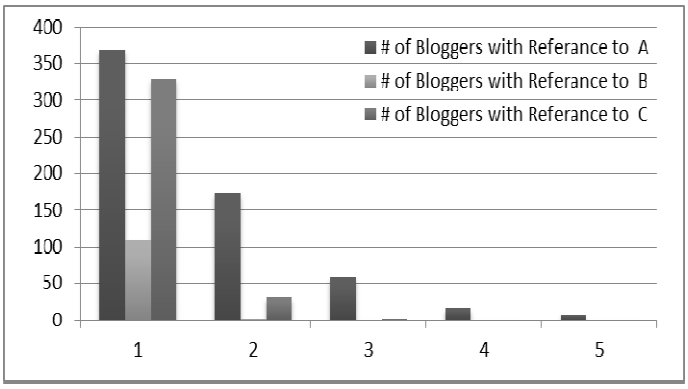
Figure5. Map of keywords for touch vs. technological difficulty (middle price products)

Table 8. Summary of keywords for middle price products

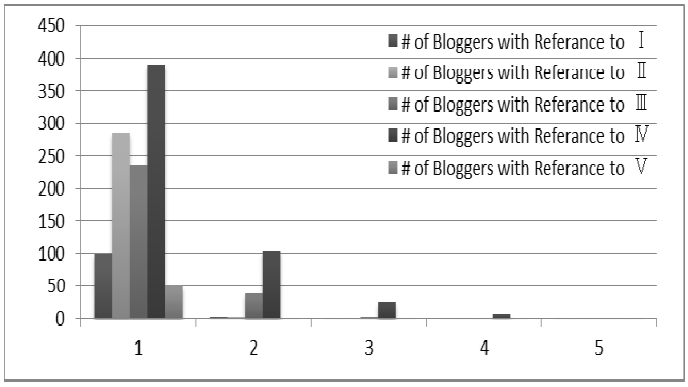
Middle Price														
No.	Keyword	Ranking/Product ID			9/KNRM001		1/KAO103		6/KEI001		8/SRE002		Total	
		Number of blogs			62		549		284		118		1013	
		Type			#	%	#	%	#	%	#	%	#	%
8	glossiness	BL	A	III	0	0.00	14	2.55	3	1.06	0	0.00	17	1.68
9	elastic softness	BL	A	III	1	1.61	9	1.64	3	1.06	1	0.85	14	1.38
10	wet softness	BL	A	III	0	0.00	104	18.94	56	19.72	10	8.47	170	16.78
11	dry softness	BL	A	III	2	3.23	27	4.92	24	8.45	15	12.71	68	6.71
13	coolness	BL	A	III	1	1.61	0	0.00	0	0.00	0	0.00	1	0.10
14	pleasantness	BL	A	III	1	1.61	0	0.00	1	0.35	0	0.00	2	0.20
15	smart	BL	A	III	0	0.00	4	0.73	2	0.70	1	0.85	7	0.69
17	driness	BL	A	III	0	0.00	8	1.46	8	2.82	2	1.69	18	1.78
18	youthfulness	BL	A	IV	0	0.00	1	0.18	1	0.35	1	0.85	3	0.30
2	clamminess	BL	B	I	0	0.00	2	0.36	0	0.00	0	0.00	2	0.20
16	glow	BO	A	III	0	0.00	6	1.09	3	1.06	6	5.08	15	1.48
19	moistness	BO	A	IV	9	14.52	120	21.86	37	13.03	41	34.75	207	20.43
20	freshness	BO	A	IV	3	4.84	12	2.19	20	7.04	12	10.17	47	4.64
23	texture	BO	A	IV	0	0.00	22	4.01	10	3.52	10	8.47	42	4.15
25	wet freshness	BO	A	IV	11	17.74	148	26.96	77	27.11	29	24.58	265	26.16
1	thickness	BO	B	I	0	0.00	57	10.38	22	7.75	20	16.95	99	9.77
6	stickiness	BO	B	II	0	0.00	7	1.28	3	1.06	3	2.54	13	1.28
5	additive-free	BO	C	I	0	0.00	3	0.55	1	0.35	0	0.00	4	0.39
7	penetration	BO	C	II	0	0.00	155	28.23	92	32.39	31	26.27	278	27.44
21	warming	BO	C	IV	11	17.74	51	9.29	21	7.39	13	11.02	96	9.48
22	conditioning	BO	C	IV	0	0.00	8	1.46	1	0.35	2	1.69	11	1.09
27	quasi drug	BO	C	V	0	0.00	0	0.00	0	0.00	2	1.69	2	0.20
12	smoothness	PR	A	III	0	0.00	5	0.91	6	2.11	2	1.69	13	1.28
24	wrinkle	PR	A	IV	0	0.00	5	0.91	2	0.70	2	1.69	9	0.89
26	whitening	PR	A	IV	0	0.00	16	2.91	11	3.87	5	4.24	32	3.16
28	sensitiveness	PR	A	V	0	0.00	29	5.28	18	6.34	1	0.85	48	4.74
3	effectiveness for sebaceous trouble	PR	C	I	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
4	weak acidness	PR	C	I	0	0.00	0	0.00	1	0.35	0	0.00	1	0.10



(a) Bloggers with referance to BO, BL, PR



(b) Bloggers with referance to A, B, C



(c) Bloggers with referance to I, II, III, IV, V

Figure 6. Number of keywords used by category (middle price products)

Table 9. Number of keywords used by category (middle price products)

Middle Price	Number of Keywords Used												Total
Class of Bloggers	0	%	1	%	2	%	3	%	4	%	5 ~	%	
Bloggers with Reference to BO	345	34.06	380	37.51	197	19.45	67	6.61	18	1.78	6	0.59	1013
Bloggers with Reference to BL	746	73.64	232	22.90	35	3.46	0	0.00	0	0.00	0	0.00	1013
Bloggers with Reference to PR	915	90.33	93	9.18	5	0.49	0	0.00	0	0.00	0	0.00	1013
Bloggers with Reference to A	393	38.80	368	36.33	173	17.08	58	5.73	15	1.48	6	0.59	1013
Bloggers with Reference to B	903	89.14	108	10.66	2	0.20	0	0.00	0	0.00	0	0.00	1013
Bloggers with Reference to C	653	64.46	329	32.48	30	2.96	1	0.10	0	0.00	0	0.00	1013
Bloggers with Reference to I	910	89.83	100	9.87	3	0.30	0	0.00	0	0.00	0	0.00	1013
Bloggers with Reference to II	725	71.57	285	28.13	3	0.30	0	0.00	0	0.00	0	0.00	1013
Bloggers with Reference to III	735	72.56	236	23.30	38	3.75	3	0.30	1	0.10	0	0.00	1013
Bloggers with Reference to IV	483	47.68	391	38.60	105	10.37	26	2.57	7	0.69	1	0.10	1013
Bloggers with Reference to V	963	95.06	50	4.94	0	0.00	0	0.00	0	0.00	0	0.00	1013

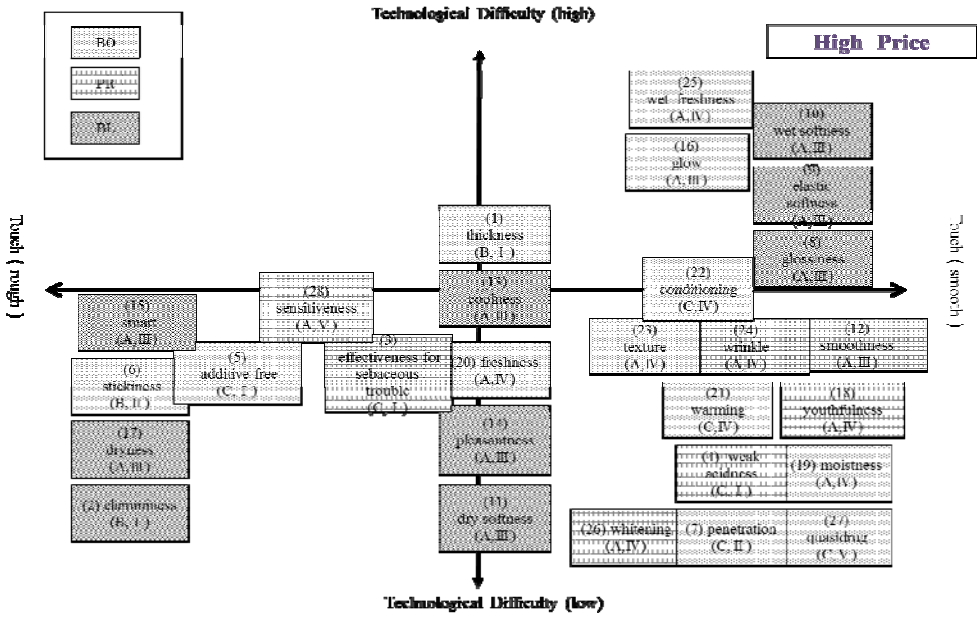
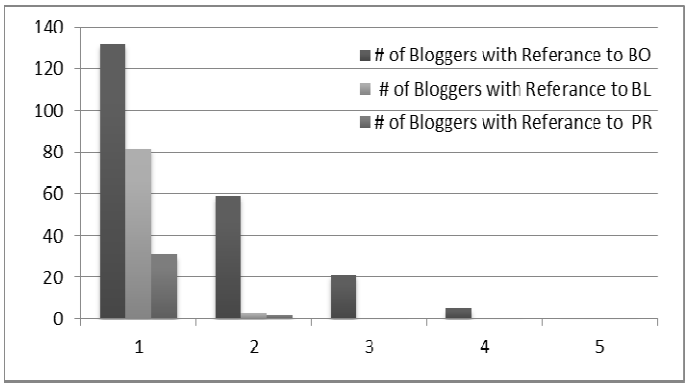


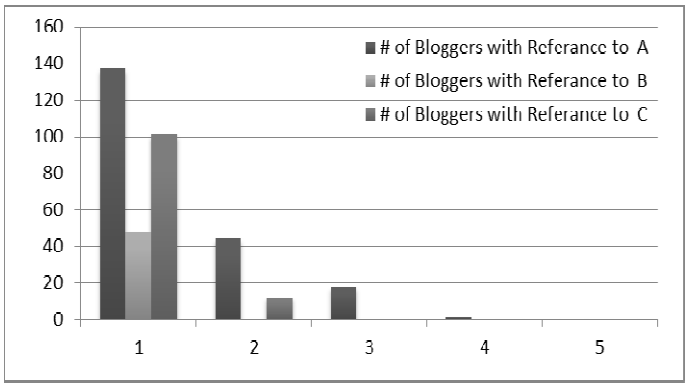
Figure 7. Map of keywords for touch vs. Technological difficulty (high price products)

Table 10. Summary of keywords for high price products

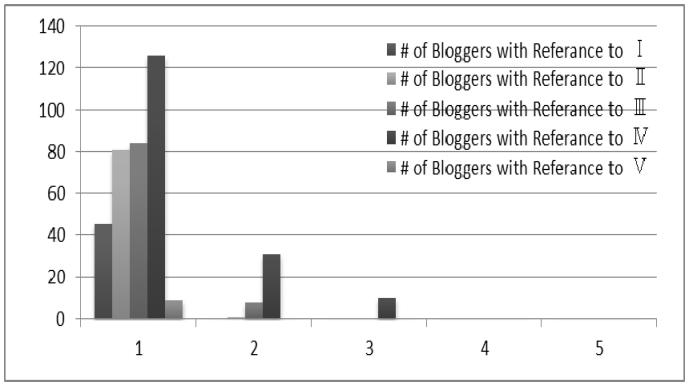
		High Price								
		Ranking/Product ID			3/SICR001		10/PRBB001		Total	
No.	Keyword	Numbor of blogs			230		90		320	
		Type			#	%	#	%	#	%
8	glossiness	BL	A	III	4	1.74	2	2.22	6	1.88
9	elastic softness	BL	A	III	6	2.61	2	2.22	8	2.50
10	wet softness	BL	A	III	45	19.57	21	23.33	66	20.63
11	dry softness	BL	A	III	5	2.17	1	1.11	6	1.88
13	coolness	BL	A	III	0	0.00	0	0.00	0	0.00
14	pleasantness	BL	A	III	1	0.43	0	0.00	1	0.31
15	smart	BL	A	III	0	0.00	0	0.00	0	0.00
17	driness	BL	A	III	0	0.00	1	1.11	1	0.31
18	youthfulness	BL	A	IV	0	0.00	0	0.00	0	0.00
2	clamminess	BL	B	I	0	0.00	0	0.00	0	0.00
16	glow	BO	A	III	5	2.17	2	2.22	7	2.19
19	moistness	BO	A	IV	49	21.30	17	18.89	66	20.63
20	freshness	BO	A	IV	3	1.30	1	1.11	4	1.25
23	texture	BO	A	IV	11	4.78	3	3.33	14	4.38
25	wet freshness	BO	A	IV	49	21.30	20	22.22	69	21.56
1	thickness	BO	B	I	24	10.43	22	24.44	46	14.38
6	stickiness	BO	B	II	2	0.87	0	0.00	2	0.63
5	additive-free	BO	C	I	0	0.00	0	0.00	0	0.00
7	penetration	BO	C	II	49	21.30	32	35.56	81	25.31
21	warming	BO	C	IV	31	13.48	10	11.11	41	12.81
22	conditioning	BO	C	IV	1	0.43	1	1.11	2	0.63
27	quasi drug	BO	C	V	1	0.43	0	0.00	1	0.31
12	smoothness	PR	A	III	4	1.74	1	1.11	5	1.56
24	wrinkle	PR	A	IV	2	0.87	3	3.33	5	1.56
26	whitening	PR	A	IV	13	5.65	4	4.44	17	5.31
28	sensitiveness	PR	A	V	6	2.61	2	2.22	8	2.50
3	effectiveness for sebaceous trouble	PR	C	I	0	0.00	0	0.00	0	0.00
4	weak acidness	PR	C	I	0	0.00	0	0.00	0	0.00



(a) Bloggers with referance to BO, BL, PR



(b) Bloggers with referance to A, B, C



(c) Bloggers with referance to I, II, III, IV, V

Figure 8. Number of keywords used by category (high price products)

Table 11. Number of keywords used by category (high price products)

High Price	Number of Keywords Used												Total
Class of Bloggers	0	%	1	%	2	%	3	%	4	%	5 ~	%	
Bloggers with Referance to BO	103	32.19	132	41.25	59	18.44	21	6.56	5	1.56	0	0.00	320
Bloggers with Referance to BL	235	73.44	82	25.63	3	0.94	0	0.00	0	0.00	0	0.00	320
Bloggers with Referance to PR	287	89.69	31	9.69	2	0.63	0	0.00	0	0.00	0	0.00	320
Bloggers with Referance to A	120	37.50	137	42.81	44	13.75	18	5.63	1	0.31	0	0.00	320
Bloggers with Referance to B	272	85.00	48	15.00	0	0.00	0	0.00	0	0.00	0	0.00	320
Bloggers with Referance to C	207	64.69	101	31.56	12	3.75	0	0.00	0	0.00	0	0.00	320
Bloggers with Referance to I	274	85.63	46	14.38	0	0.00	0	0.00	0	0.00	0	0.00	320
Bloggers with Referance to II	238	74.38	81	25.31	1	0.31	0	0.00	0	0.00	0	0.00	320
Bloggers with Referance to III	228	71.25	84	26.25	8	2.50	0	0.00	0	0.00	0	0.00	320
Bloggers with Referance to IV	153	47.81	126	39.38	31	9.69	10	3.13	0	0.00	0	0.00	320
Bloggers with Referance to V	311	97.19	9	2.81	0	0.00	0	0.00	0	0.00	0	0.00	320

The following observations can be made.

1. In general, consumers purchasing a product of lower price are more active in expressing their reaction to the product through the Internet than consumers preferring a product of higher price. The number of blogs per product is 460 for Low Price, while those for Middle Price and High Price are 253 and 160 respectively. This means that the implementation of e-marketing would be likely to be more effective for low-priced products than for high-priced products.

2. Across the three price ranges, the intent of development engineers represented by the key word “moistness (BO, A, Ⅳ)” is relatively well communicated to consumers, as can be seen from the fact that the reference rate of the key word in blogs is relatively high with 21.20% for Low Price, 20.43% for Middle Price, and 20.63% for High Price. For Middle Price and High Price, a similar observation can be made for the key words “wet freshness (BO, A, Ⅳ),” and “penetration (BO, C, Ⅱ)” with the respective reference rates of the key words in blogs given by (26.16%, 27.44%) for Middle Price, and (21.56%, 25.31%) for High Price. As for Low Price, the most important key word is “warming (BO, C, Ⅳ)” with the reference rate of 22.28%. In summary, for Low Price, the two key words “moistness (BO,

A, Ⅳ)" and "warming (BO, C, Ⅳ)" should be emphasized in implementing e-marketing, while the three key words "moistness (BO, A, Ⅳ)," "wet freshness (BO, A, Ⅳ)," and "penetration (BO, C, Ⅱ)" are important for Middle Price and High Price.

3. The key words representing the negative aspect of "Touch" are "smart (BL, A, Ⅲ)," "stickiness (BO, B, Ⅱ)," "dryness (BL, A, Ⅲ)," "clamminess (BL, B, Ⅰ)," "additive free (BO, C, Ⅰ)," "sensitiveness (PR, A, Ⅴ)," and "effectiveness for sebaceous trouble (PR, C, Ⅰ)". For Low Price and Middle Price, the sums of the reference rates of those key words are 14.46% and 9.08% respectively. On the other hand, the corresponding figure for High Price is only 3.44%. This implies that, for a product of low or middle price, it would be important to tell consumers that the product provides a wonderful "Touch" through e-marketing. Consumers preferring a product of high price tend to take it for granted that the product would provide a wonderful "Touch", and therefore the manufacturer should make sure that it would be the case.

4. For Middle Price and High Price, the percentages of the blogs with reference to one or more key words in BO are 65.94% and 67.81% respectively, while the percentage is 56.68% for Low Price. This means that those consumers who prefer highly priced products tend to share the development concepts more than those consumers who are attracted to lower prices.

5. Naturally, all consumers are concerned with the state of the skin as well as the overall feeling of the product after use, as can be seen from the fact that the reference rate to one or more key words in A is around 60%, and that in Ⅳ is more than 50% for all Low Price, Middle Price and High Price.

6. Those consumers preferring a product in Middle Price or High Price pay much more attention to the feeling of the product after several seconds of use with the respective reference rates to one or more key words in Ⅱ being 28.43% and 25.62%, in comparison with only 13.32% for Low Price.

7. As far as individual products are concerned, one can list 4/YHMK001 in Low Price, 1/KAO103, 6/KEI001 and 8/SRE002 in Middle Price, and 3/SICR001 and 10/PRBB001 in High Price, for which the intents of the development engineers are relatively well communicated to consumers.

5. CONCLUSION

The purpose of this paper is to explore the potential use of e-WOM in e-Marketing by analyzing actual blogs concerning skin lotions collected

from @COSME in the period between November 1, 2007 and October 31, 2008. The data set to be employed throughout the paper is first introduced. The basic analysis of the data set is also provided. Then, key words used by either manufactures for promoting skin lotions on the Internet or consumers in their blogs are identified. These key words are categorized in terms of development intention, the content of the key words, engineering difficulty and touch (sense of feel). The collected blog data are examined through text-mining in order to see how the key words overlap between the product descriptions and the blog data. Some implications of the analysis are also discussed, thereby providing a basis to establish effective e-marketing strategies in e-WOM communications.

This study is still in its infancy. Deeper analyses would be needed to understand the power of e-WOM in e-Marketing better. It is also desirable to collect more blog data. This line of research is in progress and will be reported elsewhere.

6. ACKNOWLEDGEMENT

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