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A Study on Reducing Malicious Replies on the Internet: An Approach by Game Theory

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***Abstract*—**Since the advent of the information era, the Internet has brought various positive effects in everyday life. Nevertheless, recently, problems and side-effects have been noted. Internet witch-trials and spread of pornography are only a few of these problems.In this study, problems and causes of malicious replies on internet boards were analyzed, using the key ideas of game theory. The study provides a mathematical model for the internet reply game to devise three possible plans that could efficiently counteract malicious replies. Furthermore, seven specific measures that comply with one of the three plans were proposed and evaluated according to the importance and utility of each measure using the orthogonal array survey and SPSS conjoint analysis.The conclusion was that the most effective measure would be forbidding unsigned user access to malicious replies. Also notable was that some analytically proposed measures, when implemented, could backfire and encourage malicious replies.

***Keywords*—**Conjoint Analysis, Game Theory, Internet, Malicious Replies, Prisoner's Dilemma

I. Introduction

SINCE the advent of the information era, the Internet has brought such various positive effects as ease and speed in everyday life. Nevertheless, recently, problems and side-effects have been noted. Internet witch-trials, language profanity, and spread of pornography are only a few of these problems.Among these problems, the most conspicuous is the malicious reply problem. In such places of vast internet industry as South Korea, malicious replies on internet boards have brought the social problem of online violence that resulted in suicides of such famous actors as Choi Jin-Sil. Recently, the malicious reply problem has become a substantial threat to the information society. Especially as the access to the Internet has met another breakthrough in the development of smart-phones, malicious replies could increase in their number and extent. There is an urgent need for countermeasures.In this study, the social situation of the internet board, in which each internet user tries to increase the number of hits on his reply, will be modeled as a mathematical game. This study aims to provide, through mathematical analysis of the proposed model, the effective measures that could prevent and moderate malicious replies on the Internet.In Section 2, various current problems regarding internet malicious replies will be seen in the example of South Korea, especially the decision-making process that leads users to post malicious replies. In Section 3, a mathematical model of the internet board will be set, along with the theoretical countermeasures to malicious replies. In Section 4, survey and statistical research will be used to evaluate the utility of each measure.

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II. Aspects of Internet Malicious Replies

A. Severity of Malicious Replies

As internet users increasingly spend time in internet boards and forums, the Internet is becoming an outlet of gratuitous attacks and indiscriminate advertisements. In South Korea, where the negative side-effects of internet board culture are recognized as one of the most serious social problems, the practice of posting replies that abuse the power of anonymity is called 'malicious reply culture[1].' Malicious replies are replies on internet boards that contain such problems as witch-trial, language profanity, and pornography advertisement.

In this Study, the example of South Korea, the country of high malicious reply rates, will be observed.

In Korea, as malicious replies have recently increased in number, public complaints about the Internet has also increased. Table I shows recently occurred cyber violence, categorized according to the type of social problem. According to the table, from 2004 to 2005, public complaints regarding cyber violence have increased by 8,608 cases, and, especially for those cases of libel and violence, the numbers rose significantly by a factor of 34. Also, according to a research by Korea Internet Safety Commission, a randomly selected newspaper website had an alarming malicious reply rate of over 50%.

TABLE I
Categories of Online Violence[2]

Year	Libel	Sexual Harassment	Violence	Prodigal	Disrupting Social Discipline	Total
2004	470	27,603	597	41	5,324	34,035
2005	1,513	29,898	2,667	250	8,315	42,648
2006.6	828	9,760	1,043	2,958	5,986	20,575

Also, Korea Communications Standards Commission reported that, from 2001 to 2006, it held a total of 24,385 cases of counseling regarding online libel, slander, stalking, and sexual harassment, the number of cases increasing year by year. These statistics show that, although the Internet has become the vital part of life, it has also become the haven of violence.

TABLE II
ANNUAL SURVEY OF ONLINE VIOLENCE [2]

Year	Total	Victim Type			
		Libel	Sexual Harassment	Stalking	Others
2001	1,054	278	204	22	550
2002	3,616	1,248	224	53	2,091
2003	4,127	1,916	557	95	1,649
2004	3,913	2,285	332	81	1,225
2005	8,406	5,735	889	193	1,589
2006.6	3,179	2,087	451	62	579
Total	24,385	13,549	2,647	506	7,683

B. Current Aspect of Malicious Replies

In August to November, 2008, Dong-A Daily and Korea Internet Security Agency analyzed about 320,000 replies of news articles with more than 200 replies. Among these replies, 69,671 replies posted on major articles were analyzed by hand. The result was that malicious replies without constructive opinion were 14.3% of the total replies.

As the analyzed replies were those that remained after the website's reply clean-ups, the actual percentage of malicious replies is speculated to be higher. Also, the most common type of malicious replies was threats and swears, which accounted for 65.3% of the replies categorized as malicious reply. The second most common was spam reply, which accounted for 36.5%.

An interesting problem was the problem of reply oligopoly, as the top 5% most enthusiastic users who replied posted 30.5% of all the replies, and the top 50% posted 44% of all the replies. As, according to the research, average of 2.5% netizens post replies, calculation gives that 0.12% of users make 1/3 of all replies.

Through malicious replies, many victims suffer from such assaults as libel and sexual harassment. Consequently, regulatory policies are becoming more restrictive, obstructing active internet environment. Many users who post malicious replies show the tendency to attract other's attention to raise their hits. These users abuse the anonymity of the Internet to post violent replies, lead witch-trials, or fabricate public opinion. The social problem of malicious replies is becoming a substantial concern.

C. Netizen's Competition for Hits

On internet boards, the netizens' interaction can be seen as a game. In the situation where the number of users who normally visit a board is fairly constant (and therefore restricted), as some netizens use malicious replies to induce readers (or hits), the readers of other replies decreases. Thus, there is a game for hits in which the normal users of the board participate. Game theory can be used to set and analyze the model for this game.

Game theory is a branch of mathematics that analyzes the favorable decisions of a game player in a competitive game that holds many players[4]. More specifically, game theory studies the ways that a game player can maximize his payoff in the premise that players do not know each other's strategy. In such complicated societal situations as the internet reply problem, game theory can be used to model and analyze the situation mathematically.

III. CONSTRUCTION OF THE MALICIOUS REPLY GAME MODEL

A. Diminishing Marginal Utility of Malicious Reply

Malicious replies have diminishing marginal utility, as can be seen in Table II. This means that the rate of increase of the malicious reply function decreases as time passes. This is because, as the number of malicious replies increase, the number of hits that each malicious reply receives decreases.

On the other hand, for healthy replies, marginal utility increases. Malicious replies tend to repel readers, but healthy replies tend to attract more readers to visit the board. Thus, equilibrium forms between the marginal utilities of malicious and healthy replies.

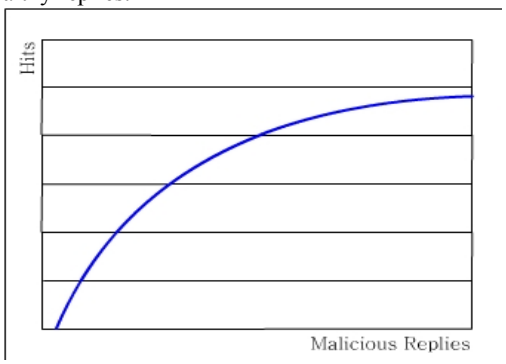


Fig. 1 Diminishing Marginal Utility of Malicious Reply

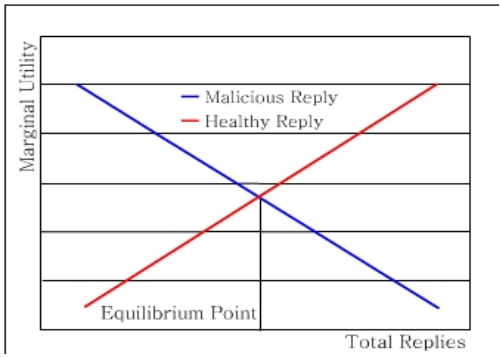


Fig. 2 Equilibrium Point of Malicious Reply

B. Application of Game Theory

Internet boards can be seen as a game in which each user competes for his own profit. Focusing on a particular user who would post a malicious reply, there is more probability the user could attract hits when there are fewer existing malicious replies on the board. Consequently, a user's best decision is to hope that other users do not post malicious replies and write an attention-grabbing malicious reply himself. This means that

cooperation with other players negatively effects the player. This type of game is called the multi-player non-cooperative game.Table III is one speculation that could model the malicious reply game in current internet boards. This type of game is specifically called the 'prisoner's dilemma,' where the rational choice is to post a malicious reply. Cooperating with other users and posting a healthy reply can result in each player getting 20 hits, but rational choice leads each user to post a malicious reply, resulting in 10 hits for each user. Thus, the optimal result (Pareto optimum) is not achieved, and the Nash equilibrium (Pareto sub-optimum) becomes the equilibrium state.

TABLE III
CURRENT GAME MALICIOUS REPLIES (PRISONER'S DILEMMA)

	Malicious Reply	Healthy Reply
Malicious Reply	10 10	5 30
Healthy Reply	30 5	20 20

Let us generalize the case to the case where more than three players participate in the reply game. Assuming that a player decides to post a malicious reply, his expected payoff with respect to the other x number of players who post malicious replies can be modeled by the function:

$$f(x) = \frac{T - r(p - x)}{x} - c$$

T = (Total Number of Readers)
r = (Average Number of Replies per Person)
p = (Number of Reply Game Players)
c = (Cost of Posting Replies)

Also, randomly assuming, for the sake of a rough understanding, that there are 10 number of game players, 100 (established 80, increased 20) number of readers increased by malicious replies, 8 average number of replies per person, and 5 unit of cost of posting replies *f(x)* gives Table IV as the number of hits with respect to the number of game players. Here, as the number of malicious replies increase, the number of hits per malicious reply decreases.On the other hand, for healthy replies, cooperation between players brings the increase of hits. As the number of players who cooperate increases, the effect of the cooperation increases, and it is possible to model the expected payoff posting healthy replies as an exponential function. For number of players who choose to post healthy replies, the expected number of hits is modeled by :

$$s(x) = rx^k$$

k = (Cooperative exponent)

Also, assuming that a player decides to post a healthy reply, his expected payoff with respect to the other x number of players who post healthy replies can be modeled by the function :

$$g(x) = \frac{s(x)}{x} - c$$

Again, assuming that k = 1.5, the expected payoff is calculated as shown in Table IV. Here, as the number of players who choose to post healthy replies increase, the expected payoff increases, and, in cases, the rational choice is to post a healthy reply. Thus, for healthy replies, this means that cooperation with other players positively effects the player. This type of game is called the multi-player cooperative game.

Nevertheless, healthy reply is not the rational choice. If all players cooperate to post healthy replies, expected payoff per person is large(20.3 in the assumed case). If one player betrays and posts a malicious reply, however, his expected payoff is 23, and the rational choice of each player becomes posting a malicious reply. As a result, all players post malicious replies, forming the Nash equilibrium.

TABLE IV
COOPERATIVE GAME MODEL OF HEALTHY REPLY

		Expected Payoff	
		Malicious Reply	Healthy Reply
Those Who Chose the Same Strategy	0	23	3
	1	13	6.3
	2	9.7	8.9
	3	8	....
	.....	.....	16.2
	7	5.5	17.6
	8	5.2	19
	9	5	20.3

TABLE V
NON-COOPERATIVE GAME MODEL OF MALICIOUS REPLY

		Expected Payoff	
		Healthy Reply	Malicious Reply
Those Who Chose Healthy Reply	0	-	5
	1	3	5.2
	2	6.3	5.5
	3	17.6	.....
	.....	.....	9.7
	7	8.9	13
	8	19	23
	9	20.3	-

C. Analysis of Players' Decision Making Process

On a specific internet board in a specific time, let the number of connected users N, the total number of hits on a reply T, the number of users who choose to post malicious replies x, and non-participants who only read replies y. The function of number of hits is then denoted *s (N-x-y)*.

The expected payoff for a person who chooses to post a malicious reply is as follows :

$$\frac{T - s(N-x-y)}{\mathrm{x}} \quad (1)$$

Also, if the probability p that a player chooses malicious reply follows the binomial distribution, the probability P_x that there are x players who choose malicious reply is

$$P_x = C_x^N p^x (1-p)^{N-x} \quad (2)$$

On the other hand, if probability q that a user just reads replies also follow the binomial distribution, the probability P_y that the number of readers y is

$$P_y = C_y^{N-x} q^y (1-q)^{N-x-y} \quad (3)$$

Using (1), (2), and (3), the average expected payoff can be calculated. The expected payoff of a player who chooses to post a malicious reply is

$$\sum_{x=0}^{N}\left[C_x^N p^x (1-p)^{N-x} \sum_{y=0}^{N-x}(C_y^{N-x} q^y (1-q)^{N-x-y}(T - s(N - x - y)))\frac{1}{x}\right] \quad (4)$$

The expected payoff of a player of who chooses to post a healthy reply is

$$\sum_{x=0}^{N}\left[C_x^N p^x (1-p)^{N-x} \sum_{y=0}^{N-x}\left(C_y^{N-x} q^y (1-q)^{N-x-y} \frac{s(N-x-y)}{N-x-y}\right)\right] \quad (5)$$

Thus, the player must compare (4) and (5) to make a rational choice. If the value of (5) is bigger than that of (4), the player's rational choice is to post a healthy reply. This means that the below condition must be met in order to induce healthy replies.

$$\sum_{x=0}^{N}\left[C_x^N p^x (1-p)^{N-x} \sum_{y=0}^{N-x}\left(C_y^{N-x} q^y (1-q)^{N-x-y}\left(\frac{s(N-x-y)}{N-x-y} - \left(T - s(N-x-y)\right)\frac{1}{x}\right)\right)\right] > 0 \quad (6)$$

Using comparative statistic analysis to focus on each variable of the above mathematical model, the influence of each variable could be understood. Comparative statistic analysis is a mathematical method in which the influence of one variable is studied under the condition that all other variables are constant.

As (6) is the necessary condition for inducing healthy replies and reducing malicious replies, comparative statistic analysis was used on this inequality. As the combination function (C_x^y) discourages partial differentiation, the condition was simplified, and the below condition was tested for signs (either positive or negative).

$$\Pi = \frac{s(N-x-y)}{N-x-y} - [T - s(N-x-y)]\frac{1}{x}$$

1. *WRT the total number of hits T,*

$$\frac{\partial \Pi}{\partial T} = -\frac{1}{x} < 0$$

This inequality implies that, when other variables are controlled, the increase in the total number of hits results in the decrease in the number of healthy replies. In other words, the more active an internet board is, the more numerous malicious replies are. This means that restricting hits can prevent malicious replies. This measure, however, collides with the issue of active internet environment to which the world's internet technology is aiming.

2. *WRT the number of healthy replies (N-x-y),*

$$\frac{\partial \Pi}{\partial (N-x-y)} = -\frac{s(N-x-y)}{(N-x-y)^2} + \frac{s'(N-x-y)}{x} + \frac{s'(N-x-y)}{N-x-y} < 0$$

Here, as *s(N-x-y)* is a strictly decreasing function, and *s'(N-x-y)<0*. This means that the increase of healthy replies will result in the decrease in the expected payoff of choosing healthy reply and a comparative increase of malicious replies. Hence, to prevent malicious replies, there is a need to support healthy replies so that *s'(N-x-y)* is increased.

3. *WRT the cooperation function s,*

$$\frac{\partial \Pi}{\partial s(N-x-y)} = \frac{1}{N-x-y} + \frac{1}{x} > 0$$

This inequality implies that, under variables controlled, the increase in cooperation-induced hits results in the increase of healthy replies. Hence, supporting healthy reply cooperation and increasing the derivative of *s(N-x-y)* can theoretically reduce malicious replies.

IV. Devising of Measures and Evaluation

A. Devising of Measures against Malicious Replies

For an internet community as a whole, the best public interest is to reach the Pareto optimum, or the condition where

all the participants maximize their expected payoff. Nonetheless, the equilibrium state of current internet communities, as seen in Table VI, is not the Pareto optimum, but rather region [I]. This equilibrium state is the result of the prisoner's dilemma form of game involving internet replies. Hence, to reduce malicious replies and reach the Pareto optimum, three plans that break the current deadlock can be suggested. Furthermore, these plans, combined with the mathematical analysis of the game model, can be specified into seven detailed measures against malicious replies.

Plan 1 Encouraging and advertising cooperative healthy reply ([I]→[III] shift in Table VI)

Plan 2 Encouraging hits for healthy reply ([I]→[II] shift in Table VI)

Plan 3 Restricting hits for malicious reply ([II]→[III] shift in Table VI)

TABLE VI
CURRENT EQUILIBRIUM AND REQUIRED SHIFTS

	Malicious Reply	Healthy Reply
Malicious Reply	[I] A A	[II] B C
Healthy Reply	[II] C B	[III] D D

1. *Plan 1. Encouraging Cooperative Healthy Reply*

Plan 1 attempts to accomplish both the feat of preventing malicious replies and the feat of encouraging active Internet environment. To encourage cooperative healthy reply, it is possible to group users according to their known character of replies so that each user of different group cannot interact with one another. Also, the definition of healthy reply must be expanded so that neat format is also a character of healthy reply. Giving out incentives to the posters of healthy replies might also help.

-Measure 1. The writer of nominated healthy reply is rewarded prize or incentive.

-Measure 2. That neat format, as well as healthy content, counts as a healthy reply is advertised.

-Measure 3. Board access is restricted to signed-in users, and each user's writing and reading capacity is restricted according to evaluated points.

2. *Plan 2. Encouraging Hits for Healthy Reply*

There is a current program in which some replies are designated as 'recommended' replies, there does not seem to be a visible effect. Instead, changing the font style and color or order of the designated replies might effectively induce hits.

-Measure 4. Nominated healthy reply is emphasized and then moved to the upper part of the board.

-Measure 5. Font color and font style of a nominated healthy reply is changed so that it is conspicuous.

3. *Plan 3. Restricting Hits for Malicious Reply*

An indiscriminate deletion of malicious replies as a policy could impediment active use of the Internet. Thus, there is a need for a prevention policy. An example is a program in which reported malicious replies are only visible to those users who are signed in.

-Measure 6. Access to reported malicious reply is restricted to signed-in users.

-Measure 7. Reported malicious replies are made semi-transparent.

B. Evaluation Survey of the Devise Measures

To objectively evaluate the efficiency of the above proposed measures, there is a need for proper evaluation weights. A commonly used method of analyzing such plans and measures as above is the conjoint analysis. Conjoint analysis, frequently used in marketing and product management, uses data such as preference rank to find the attributes and attribute values that customers consider important[7].

To reduce the malicious replies, attributes about replies that most internet users consider important must be analyzed so that the importance of the attributes can be compared. Hence, the use of conjoint analysis is reasonable for the evaluation of the devised measures against malicious replies.

Conjoint analysis involves the process of selecting reasonable attributes, attribute levels, and survey forms. In this study, there are 2^7=128 possible combinations of selected measures (which can also be viewed as the number of subsets of the set of the seven measures).

Generally, a conjoint analysis survey asks the subject to rank the given combinations. The full method, however, is inapplicable when the number of the combinations is too large. This is the case in this study, as there are 127 combinations. Hence, a more convenient method using the orthogonal design will be implemented. The orthogonal design method, used frequently in conjoint analysis, is usually in the form of orthogonal array, shown in Table VII[6]. With seven measures, the orthogonal array reduces the 127 combinations into 8 combinations. These 8 combinations can be used in a survey for conjoint analysis.

TABLE VII
2^7 ORTHOGONAL ARRAY

		Attribute						
		1	2	3	4	5	6	7
Card Type	Card 1	1	1	1	1	1	1	1
	Card 2	1	1	1	2	2	2	2
	Card 3	1	2	2	1	1	2	2
	Card 4	1	2	2	2	1	1	1
	Card 5	2	1	2	1	2	1	2
	Card 6	2	1	2	2	1	2	1
	Card 7	2	2	1	1	2	2	1
	Card 8	2	2	1	2	1	1	2

TABLE VIII
ORTHOGONAL ARRAY FOR THE CONJOINT ANALYSIS OF THE 7 MEASURES

	Ms. 1	Ms. 2	Ms.3	Ms. 4	Ms. 5	Ms. 6	Ms. 7
1	○	○	○	○	○	○	○
2	○	○	○	×	×	×	×
3	○	×	×	○	○	×	×
4	○	×	×	×	×	○	○
5	×	○	×	○	×	○	×
6	×	○	×	×	○	×	○
7	×	×	○	○	×	×	○
8	×	×	○	×	○	○	×

For an objective evaluation of the efficiency of the proposed measures, a survey about the measures was devised and was taken by high school students who are familiar with the internet environment and internet reply culture.

Date : December, 2010
Subject: 30 Korean high school students
Method : paper survey in a classroom setting; survey sheet and cards provided in the Appendix

C. Data Analysis and Discussion

The statistical analysis process of the survey results was facilitated by the conjoint analysis tool of IBM's SPSS 12.0. The result of the conjoint analysis, including the importance and utility of each measure, is shown on Table IX. The utility of each measure describes the satisfaction that users feel about the measure, and the importance denotes the percent ratio of the utility of the measure in the case in which all measures are implemented.

TABLE IX
ATTRIBUTES AND LEVELS OF THE SURVEY CARD

	Measure	Utility		Importance(%)
		Implemented	Not Implemented	
1	The writer of nominated healthy reply is rewarded prize or incentive.	0.2917	-0.2917	15.98
2	That neat format, as well as healthy content, counts as a healthy reply is advertised.	-0.4083	0.4083	17.79
3	Board access is restricted to signed-in users, and each user's writing and reading capacity is restricted according to evaluated points.	0.3500	-0.3500	11.57
4	Nominated healthy reply is emphasized and then moved to the upper part of the board.	-0.2083	0.2083	12.69
5	Font color and font style of a nominated healthy reply is changed so that it is conspicuous.	0.2833	-0.2833	10.23
6	Access to reported malicious reply is restricted to signed-in users.	0.1833	-0.1833	16.15
7	Reported malicious replies are made semi-transparent.	0.0417	-0.0417	15.60

The conjoint analysis showed that measure 2 was considered the most important (17.8) In summary, excluding measures 2 and 4, the conjoint analysis showed that the measures were considered efficient in the following order: measure 6 > measure 1 > measure 7 > measure 3 > measure 5.

V. CONCLUSION

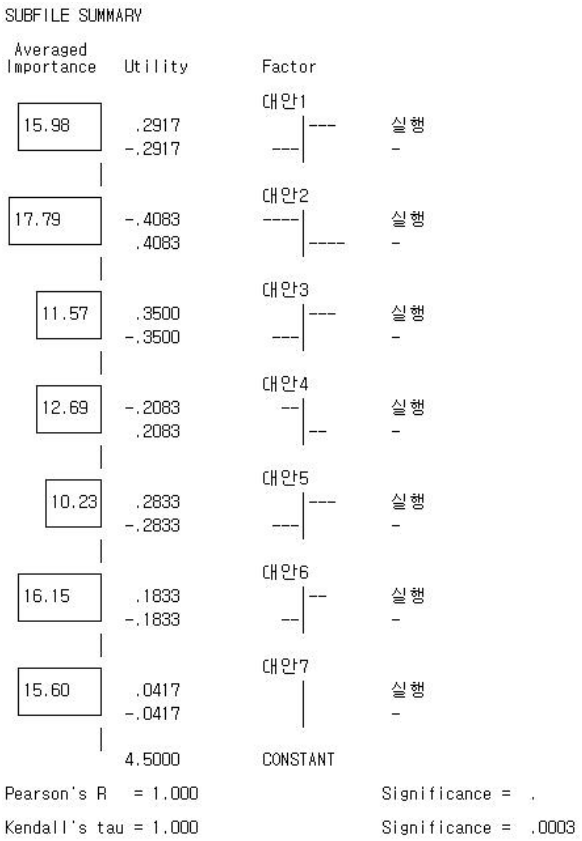
The Internet must respect each user's interest, but it must place public benefit as the first in priority. Nonetheless, the selfish motives of internet users are encouraging the increase of malicious replies on internet boards, resulting in the decrease in the public benefit of the Internet. As individual users will be interested in the increase of hits, it is highly probable that they will choose to post malicious replies. On the whole, the users' decisions will not get the optimal results.

In this study, this social situation was analyzed through a game model, and long-term solutions were proposed. In the long term, it is more beneficial to reduce the anonymity of internet boards or diversify the ways to induce hits other than the content of replies, although this could decrease the short-term number of hits and number of users.

Nonetheless, the above theory, evaluated by survey, still requires a gradual verification in the real internet environment before the actual implementation of the proposed countermeasures to malicious replies.

APPENDIX

A. Conjoint Analysis Results (SPSS 12.0)



B. Survey Cards (in Korean)

인터넷 악성댓글 방지를 위한 설문조사

※ 저는 인터넷의 악성댓글 방지를 위한 대안에 대한 연구를 진행 중입니다. 여기에 제시된 7가지의 대안들은 악성댓글 방지와 관련된 대안입니다. 이 설문 조사를 통해 각각 대안의 기대 효과를 측정하고자 합니다. 조사의 정확도 향상을 위하여 진중히 성실하게 설문에 응해 주시면 감사하겠습니다.

■ 이 설문조사는 연구 목적으로만 사용됩니다.

1. 네이버, 네이트, 다음과 같은 인터넷 포털에서 악성댓글 방지를 위한 대안으로 다음 7가지가 제시되었습니다. 첨부한 카드들은 악성댓글 방지를 위한 대안들입니다. 각 카드를 읽어보신 후 악성댓글 방지 효과가 높은 것부터 순서대로 배열하여 주세요. 여덟 번 고민해 배열하셔도 됩니다.

< 배열방법 >

1. 8장의 카드를 받아든 후 가장 기대 효과가 높다고 생각하시는 대안이 있는 카드 4장을 우선적으로 고릅니다. 다른것는 제쳐서 배열합니다

예) "'건전댓글'도 선정되면 상품 또는 인센티브를 준다."대안이 있는 카드 4장 우선 배열

2. 앞쪽 4장과 제쳐 4장을 따로 분류하여, 각 분류 내에서 두 번째로 기대 효과가 높은 대안이 포함된 카드를 2장씩 골라 순서대로 배열합니다.

3. 이렇게 대안별로 카드를 모두 배열한 후, 카드 간의 순서를 전체적으로 조정합니다.

4. 전체적으로 다시 한번 순서를 검사합니다.

5. 배열한 카드의 번호를 순서대로 기입표에 기입합니다.

< 배열 순서 >

순위	1	2	3	4	5	6	7	8
카드번호								

①	내 용
1	'건전댓글'도 선정되면 상품 또는 인센티브를 준다.
2	우수한 내용뿐만 아니라 보기좋게 작성한 댓글도 건전댓글로 선정한다.
3	'로그인'을 하면, 비슷한 건전등급을 가진 타인의 댓글만 보이게 된다. (유용상품)
4	'건전댓글'이 되면, 댓글의 가장 상단에 강조되어 나타난다.
5	'건전댓글'로 지정되면, 색상이나 폰트가 팔보이도록 변한다.
6	'악성댓글'도 추천된 댓글의 경우, 로그인을 통해서만 읽을 수 있도록 한다.
7	'악성댓글'로 추천된 댓글의 경우, 한두번과 차이되어 읽기 어려워지게 한다.

②	내 용
1	'건전댓글'도 선정되면 상품 또는 인센티브를 준다.
2	우수한 내용뿐만 아니라 보기좋게 작성한 댓글도 건전댓글로 선정한다.
3	'로그인'을 하면, 비슷한 건전등급을 가진 타인의 댓글만 보이게 된다. (유용상품)
4	
5	
6	
7	

③	내 용
1	'건전댓글'도 선정되면 상품 또는 인센티브를 준다.
2	
3	
4	'건전댓글'이 되면, 댓글의 가장 상단에 강조되어 나타난다.
6	'건전댓글'로 지정되면, 색상이나 폰트가 팔보이도록 변한다.
6	
7	

④	내 용
1	'건전댓글'도 선정되면 상품 또는 인센티브를 준다.
2	
3	
4	
5	
6	'악성댓글'도 추천된 댓글의 경우, 로그인을 통해서만 읽을 수 있도록 한다.
7	'악성댓글'로 추천된 댓글의 경우, 한두번과 차이되어 읽기 어려워지게 한다.

⑤	내 용
1	
2	우수한 내용뿐만 아니라 보기좋게 작성한 댓글도 건전댓글로 선정한다.
3	
4	'건전댓글'이 되면, 댓글의 가장 상단에 강조되어 나타난다.
5	
6	'악성댓글'도 추천된 댓글의 경우, 로그인을 통해서만 읽을 수 있도록 한다.
7	

⑥	내 용
1	
2	우수한 내용뿐만 아니라 보기좋게 작성한 댓글도 건전댓글로 선정한다.
3	
4	
5	'건전댓글'도 지정되면, 색상이나 폰트가 팔보이도록 변한다.
6	
7	'악성댓글'로 추천된 댓글의 경우, 한두번과 차이되어 읽기 어려워지게 한다.

⑦	내 용
1	
2	
3	'로그인'을 하면, 비슷한 건전등급을 가진 타인의 댓글만 보이게 된다. (유용상품)
4	'건전댓글'이 되면, 댓글의 가장 상단에 강조되어 나타난다.
6	
6	
7	'악성댓글'로 추천된 댓글의 경우, 한두번과 차이되어 읽기 어려워지게 한다.

⑧	내 용
1	
2	
3	'로그인'을 하면, 비슷한 건전등급을 가진 타인의 댓글만 보이게 된다. (유용상품)
4	
5	'건전댓글'로 지정되면, 색상이나 폰트가 팔보이도록 변한다.
6	'악성댓글'도 추천된 댓글의 경우, 로그인을 통해서만 읽을 수 있도록 한다.
7	

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