

소셜 네트워크 사이트의 구전 마케팅의 효과성 영향 요인

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Factors Affecting Viral Marketing Effectiveness in Social Network Sites

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■ Abstract ■

Social Network Services (SNSs) have grown to be new and promising tools of marketing. By referring to researches done on e-mail viral marketing, this paper operationizes SNS viral marketing effectiveness to accurately reflect marketing success in SNS environment, and tries to identify its affecting factors. As potential affecting factors, fan size, advertisement type, existence of engagement elicitation and incentive are identified. By sampling real advertisement postings on Facebook, we showed that fan size, advertisement type, and engagement elicitation are factors affecting SNS viral marketing success. This research expanded the conventional model of viral marketing into SNS settings to improve understanding on SNS viral marketing. Motivation is discussed as an important factor, and this research showed that viral campaign can be more successful when it triggers internal motivation to engage, but not the external motivation. This research could also be a guide for practitioners on how to post a successful advertisement in SNSs.

Keyword : Social Network Services, Viral Marketing, Word of Mouth, Advertisement Effectiveness, Motivation

1. Introduction

With the spread of Social Network Services (SNSs) including Facebook, Twitter, and YouTube, many firms have initiated marketing strategies utilizing them (Chu and Kim, 2011; De Vries et al., 2012; Giamanco and Gregoire, 2012; Michailidou, 2011). SNSs are viewed as promising marketing tools with their publicity and high accessibility (Bolotaeva and Cata, 2011). Firms can easily reach out to customers through web, without much cost in creating and distributing contents (Winer, 2009).

Marketing in SNS environment has features that closely resemble the word-of-mouth marketing. Word-of-mouth is the act of consumers telling each other about the products or services (Godes and Mayzlin, 2004; Katz and Lazarfeld, 1955; Phelps et al., 2004). Extension of word-of-mouth marketing with the development of the Internet came the viral marketing, which was first coined by Draper Fisher Jurvetson in 1997 to explain the Hotmail's marketing strategy of including its ads in its subscribers' emails (Beeler, 2000; Montgomery, 2001). Online viral marketing, in its initial stage used e-mail as its channel. Recently companies started utilizing SNS as another tool of viral marketing, however researches on online viral marketing were more restricted to marketing using e-mails, not including the viral marketing in SNS environment. As marketing in SNSs resembles aspects of viral marketing such as consumer participation and exponential spreading, interpreting SNS marketing as a new field of viral marketing could increase the understanding of the marketing in the SNS environment.

Although there were researches on viral mar-

keting, the previous models of online viral marketing cannot be exactly applied to the SNS environment. There are some significant differences between the previous online viral marketing using e-mails and the online viral marketing utilizing SNSs. Previous online viral marketing using e-mail could be interpreted as linear communication model in which senders send messages to receivers through unidirectional channels (Duncan and Moriarty, 1998). SNS viral marketing is closer to transactional communication model. In the transactional communication model, unlike the linear model, each individual affects others simultaneously. Individuals encode verbal or nonverbal cues and decode or react to others' (Mortensen, 2009). Unlike e-mails or other traditional online marketing tools, in SNSs people's responds toward an advertisement affect not only the sender of the advertisement but also the other readers of the post. Therefore everyone is a sender and a receiver at the same time, directly relating to the transactional model.

Marketing through SNS is more fast-paced and customers do not have to take as much steps to participate in viral campaigns compared to previous online viral marketing. Using the conventional viral marketing model of linear transaction as foundation, this paper will modify it so that it can be used in SNS environment. Also, even though many companies started actively engaging in SNS marketing, not much theoretical basis on how to improve SNS marketing effectiveness is presented. Many advertisement success stories in SNS were more descriptive than prescriptive (Deighton and Kornfeld, 2011; Kaplan and Haenlein, 2012). As SNS viral marketing will be even more popular, there is increasing demand for theoretic guideline on

how to effectively engage in one. A new paradigm of social media demands new models (Meadows-Klue, 2008).

This paper aims to find factors that affect the advertisement effectiveness in SNS viral marketing and thereby suggest a model for SNS viral marketing success. This paper will operationalize the marketing effectiveness to accurately reflect marketing success in SNS environment. It will then test potential affecting factors of marketing effectiveness through collecting data from advertisements already done in the SNS. Potential factors include fan size, advertisement type, existence of engagement elicitation and incentive. This paper is organized as follows: In section 2, we will discuss previous research on this topic and related issues. Section 3 will introduce our research approach and research model along with hypotheses. Research method will be elaborated in section 4 and results will be shown in section 5. We discussed the implication and consequence of this research in section 6. Section 7 will conclude this paper.

2. Research Background

2.1 Viral Marketing

There have been many researches regarding the viral marketing, mostly focusing on the viral marketing using e-mails as a media of spreading. Watts and Peretti (2007) discussed about the characteristics of viral marketing which centers in small-seed and exponential growth (Watts and Peretti, 2007). Many researches discussed on quantifying and thereby predicting the effect of viral marketing. Hogan et al. (2004) used customer lifetime value approach to more accurately

estimate the effect of word-of-mouth (Hogan et al., 2004). There also has been effort to predict the spread using viral branching model. Other researchers studied on the effect of consumers' trust on the success of viral marketing (van der Lans et al., 2010) and relationship between social structure of digital networks and viral marketing effectiveness (Bampo et al., 2008). Various efforts to estimate the spread of viral campaigns from previous researches can be applied to SNS viral marketing model, however with some modifications.

2.2 Social Network and Viral Marketing

Besides researches on e-mail viral marketing, there are researches that could be more directly related to the viral marketing in SNS environment. There were case studies on particular companies or individuals who successfully used social network as a tool of viral marketing (Deighton and Kornfeld, 2011; Kaplan and Haenlein, 2012). Adam J. Mills (2012) suggested more conceptual approach on how virality can function in social media (Mills, 2012). The research proposed that spreadability, propagativity, and integration are crucial in delivering viral content. Berger and Milkman (2011) focused on contents and discusses what values can make contents itself viral in the latest social media, such as the YouTube (Berger and Milkman, 2011). Other research discussed on spreading brand message using viral marketing (Doebels et al., 2005). Deriving from the conceptual models of previous researches, we aim to provide a model suited for SNS viral marketing success and validate through practical SNS advertisement data.

2.3 SPIN Framework

SPIN Framework, introduced by A. J. Mills (2012), categorizes four major factors that lead to successful viral campaign : Spreadability, Propagativity, Integration, and Nexus. Spreadability can be understood more intuitively. If the message inside the campaign is more likeable and sharable, the more likely the campaign will reach more people. Mills mentions that contents embedding motivation can turn receivers into senders (Mills, 2012). Propagativity refers to how convenient people can share and spread the campaign. Firms can exponentially increase the effect of their marketing by integrating multiple campaigns done in multiple channels, thereby building their brands. Nexus is the final stage where new viral contents are released continuously to engage with consumers even at the emotional level. SPIN Framework gives profound understanding on important factors of viral marketing success, which could also be expanded in our research to explain SNS viral marketing success.

2.4 Motivation Theory

There also were researches on motivation which is related to our affecting factors. Self-determination theory (SDT) divides motivation into being autonomous and controlled. SDT showed that intrinsic motivation is more effective than extrinsic rewards (Deci and Ryan, 1985). There have been many researches that expanded upon the theory of motivation. Deci et al. (1994) explained the need to internalize extrinsic motivations and suggests methods to facilitate internalization (Deci et al., 1994). Other researches dealt with SDT in other environments, such as

the work settings (Gagne and Deci, 2005). Besides more fundamental theories on motivation, there were researches that connect motivation and SNS marketing. Gambetti and Graffigna (2010) discussed about engagement, and explained that media-related factors are important in fast-changing media environment (Gambetti and Graffigna, 2010). Other research focused on consumers' motivation to participate in viral campaign (Phelps et al., 2004). The research categorized many reasons why people would send pass-along e-mails of viral campaign. The research showed that the biggest motivation for people was "because it's fun."

2.5 Facebook

The experiment of this paper focuses on Facebook as a representative social network service. Facebook and Twitter are similar in that people receive posts of other people through News Feeds or Walls. However the algorithms which determine what posts to show up in individual's News Feed or Wall are different. Facebook has its own News Feed algorithm called the "Edge Rank." In News Feed, people see posts written, liked, commented, or shared by their friends. However not all posts show up in people's News Feeds (then people with more than hundreds of friends will not be able to manage their News Feeds). EdgeRank algorithm decides what post to show up in individual's News Feed. Although the specific algorithm is not revealed, EdgeRank is known to be a function of affinity, weight, and time decay. It is summarized as $\sum Ue \times We \times De$, where Ue refers to affinity, We to weight, and De to time decay. Affinity basically means that posts written, liked, or commented by friends

who had more interactions with have higher possibility of showing up in one's News Feed. In explaining weight, they say comments have more affect in the algorithm than likes, and photos or videos have more affect than links or texts. Time decay suggests that older advertisements are likely to vanish from people's News Feeds.

Although we do not know the exact function of Facebook News Feed algorithm, by dividing Facebook advertisement success into major factors such as number of likes, number of comments, and advertisement lifespan, we can study factors that affect those variables. By testing potential affecting factors, this research will deliver meaningful implication of SNS viral marketing effectiveness.

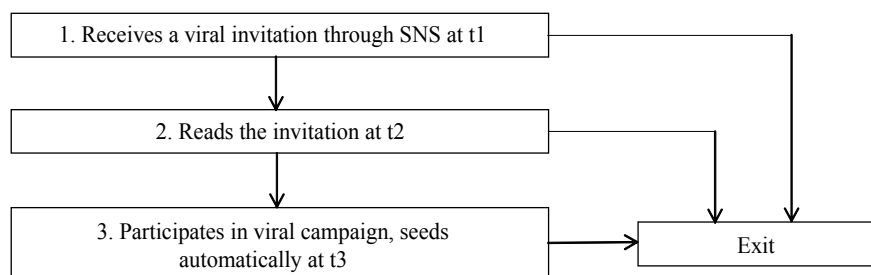
3. Research Approach and Model

3.1 Research Approach

Previous attempt to explain viral marketing in the e-mail environment plotted five-step decision tree for customers (van der Lans et al., 2010). Customers 1) receive invitation to viral campaign, 2) read the invitation, 3) visit landing page viral campaign, 4) participate in viral campaign, and 5) invite x number of friends. In each

step of this decision tree, customers have choices of exiting the viral campaign. However this decision tree cannot be used in the SNS environment. In typical SNS environment, customers do not need to click or take another step to visit the landing page. Many companies use SNS itself for marketing rather than inviting people to their sites. For instance, companies will post advertisements in their Facebook page, which will show up in people's News Feed. Also in SNS environment, participating in viral campaign and inviting friends (step 4 and 5) are not separate actions. Liking or commenting in Facebook viral campaign, or retweeting viral campaign on twitter automatically leads to inviting friends, since such actions will show up in friends' News Feed and Wall.

Based on the previous viral campaign decision tree and adjusting it according to the SNS characteristics, we can come up with a new decision tree for SNS viral marketing campaign as shown in <Figure 1>. For instance, a Facebook user will receive a viral invitation through his or her News Feed. Those advertisements will appear as results of his or her friends' like, comment, or share. Companies can post their advertisements in people News Feed directly by paying certain amount to Facebook, but this paper will not include such type of advertisements as it is hardly viral; those



<Figure 1> Decision Tree for SNS Viral Marketing Campaign

advertisements cannot be liked or commented. After viral invitations are shown to Facebook users, they will read the invitation or skip the advertisements unread. After they read the advertisements, they have a choice of participating in viral campaign or not. Customers participate in viral campaign through liking, commenting, and sharing the Facebook advertisement posts. In SNS, participating in viral campaign directly leads to spreading. Liking or commenting on a post itself provide a possibility of the post appearing in his or her friends' News Feeds. Whether or to whom the post will appear depends on the "EdgeRank," the Facebook News Feed algorithm.

3.2 Research Model

Research model is designed on the basis of SPIN (Spreadability, Propagativity, Integration, and Nexus) framework by Adam J. Mills and SDT theory. Mills (2012), in his research on virality in social media, explained that there are three major factors affecting virality. Summarized as SPIN framework, he explains that spreadability, propagativity, integration will lead to nexus, or ultimate success of viral marketing (Mills, 2012). This paper focused on the propagativity of the SPIN framework. Spreadability of the carrier of advertisements is controlled in this study because we only took consideration of one carrier, the Facebook. Also integration, which refers to combined marketing utilizing various online and off-line media, is not related to our research. Propagativity is then divided into four categories : cycle time, network size, content richness, and content proximity (Mills, 2012). Cycle time, or "technical accessibility and functionality of the means

of redistribution" and content proximity, meaning how contents is closely located with the means of spreading are controlled as every Facebook advertisement is equal in those aspects.

Network size and content richness are parts where firms can adjust in Facebook. Mills defines network size as the size of a company's e-mail contact list. If we apply it to Facebook, network size can be interpreted as fan size. An advertisement post in Facebook will initially reach its fans, starting a viral spread from there. Since fan size is something firms can affect, increasing fan size could be a potential strategy to increase propagativity and lead their viral campaign to success. Content richness, or nature of content, is also a factor that firms can affect. Facebook technologically allows various forms of advertisements including texts to videos. By altering the content richness, Mills believed that the success of viral campaign could be affected. Applying this to Facebook viral campaign, we could expect that there could be some difference in advertisement effectiveness, depending on the advertisement types.

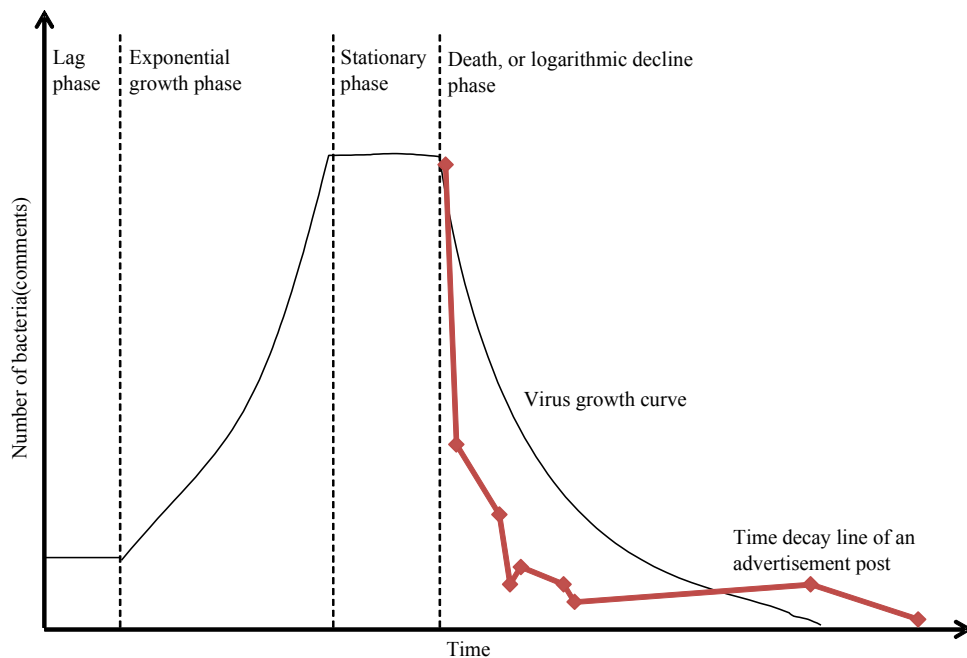
Besides fan size and advertisement type, other potential affecting factors to advertisement effectiveness comes from SDT, or self-determination theory. Self-determination theory divides people's motivation to autonomous motivation and controlled motivation, or intrinsic motivation and extrinsic motivation (Gagne and Deci, 2005). People's motivation to participate in SNS viral campaign can also be divided as intrinsic and extrinsic. Intrinsic motivation will be an autonomous action of people, such as people liking or sharing because they simply enjoy the advertisement post, or because they want their friends to see it together. In SNS marketing, many com-

panies elicit engagement to motivate people to participate in viral campaigns. Companies can ask questions to their fans, or request fans to share their own experiences. Engagement elicitation on such posts are intrinsic motivation drivers as no monetary compensation is offered. However, some SNS advertisements offer gifts or monetary compensation in exchange of spreading or participating in a viral campaign. These actions trigger extrinsic motivations. As SDT explains, we expect that asking for engagement will be more effective than offering incentives.

To look for factors affecting SNS viral marketing effectiveness, the definition of advertisement effectiveness in SNS marketing is substantial. In previous researches on viral marketing, the spread of viral campaign equated advertisement effectiveness (Hogan et al., 2004; van der Lans et al., 2010). And the spread in the previous re-

searches focused on how many people the viral campaign e-mails reached. This research will also use the definition of viral marketing effectiveness from previous research, but the spread is operationalized using the measurable factors of Facebook. Facebook itself provides some information that records the spread of an advertisement post. Although it is difficult to find out exactly how many people saw the post in their News Feeds, numbers of likes and comments are recorded. These data directly record the number of people who were interested in the viral campaign and indirectly imply the number of people the advertisement reached. Therefore number of likes and comments can be used as measurements of SNS advertisement effectiveness.

Besides numbers of likes and comments which are in connection with the conventional concept of spread in viral marketing, a novel concept of



〈Figure 2〉 Virus Growth Curve and a Time Decay Line

lifespan is used to gauge the advertisement effectiveness. Lifespan of an advertisement is measured by counting the number of days between the first comment and the last comment of an advertisement post. Although the time and date of likes are not explicitly recorded, the time and date of comments are shown.

The concept of lifespan can be derived from the virus growth curve. <Figure 2> overlaps a simplified graph of virus growth curve and an example of time decay curve of an SNS viral advertisement. The virus growth curve is characterized with exponential growth, stationary phase, and logarithmic death. We can apply this graph from viral marketing by altering the y-axis from number of bacteria to number of people who saw the advertisement. The lifespan of an advertisement will be the time from the beginning to the total death. By empirically drawing a time decay curve for Facebook advertisements, we could see that the time decay curve follows the logarithmic death phase. The three other stages that come before happens so quickly in SNS; spreading and stationary stage of an SNS advertisement does not even take a day. However, time decay curve shows that the number of comments by day decreases logarithmically, following the virus growth curve.

Lifespan of Facebook advertisement post is significant in advertisements success, because lifespan records the time decay of a Facebook advertisement. Facebook News Feed system or Edgerank is designed so that Facebook posts do not show up in people's News Feed according to time. The time until the decay, or lifespan, can be affected by number of likes and comments, and depends on individual's preference or affinity toward the fan page. Lifespan of Facebook

advertisement relates to advertisement effectiveness as lifespan is an important factor that is related to the spread, or how many people the advertisements reach.

Affecting factors of SNS advertisement effectiveness also come from measureable factors in SNS environment. Fan size is expected to be an important factor affecting the success of viral campaign (De Vries et al., 2012). Fan size directly relates to the size of initial seeds in conventional viral marketing. Viral campaign is characterized by small seeding and exponential growth. Facebook can easily provide the environment for exponential growth and with bigger seed size, the effect is expected to be even magnified (Watts and Peretti, 2007). There has been an effort to explain word-of-mouth marketing effectiveness as a sum of volume and impact (Bughin et al., 2010). Fan size directly relates to the volume of word-of-mouth. Although many previous literatures support the fact the bigger fan size lead to successful viral campaign, we conducted analysis to figure out whether the previous theories could be proven with real data.

H1 : SNS advertisements' effectiveness is affected positively by fan size.

H1-a : SNS advertisements' number of Likes is affected positively by fan size.

H1-b : SNS advertisements' number of comments is affected positively by fan size.

H1-c : SNS advertisements' lifespan is affected positively by fan size.

SNS viral campaigns consist of various forms of advertisements. Since this research focused

on Facebook, only the advertisement types that could appear in the Facebook are considered. The types are 1) text or links, 2) photo or image, and 3) video. Although the categorization is made within Facebook viral campaigns, this categorization could be used in other types of SNSs. Text, image, and video are major types of advertisements we could see in various media of advertising. Based on Mills' SPIN frameworks, we expect that there could be some difference in marketing effectiveness depending on the advertisement type (Mills, 2012). Also as the Edge Rank weighs more to videos and photos than links or texts, we can speculate that video and photo will increase the effectiveness of Facebook advertisement than texts. As videos can convey more information while maintaining concentrativeness, it is expected to be the most effective. Also photos attract people's attention in their News Feed than text, so it is predicted to be better tool of advertisement than texts.

H2 : SNS advertisements' effectiveness is affected by advertisement type.

H2-a : SNS advertisements' number of Likes is affected by advertisement type.

H2-b : SNS advertisements' number of comments is affected by advertisement type.

H2-c : SNS advertisements' lifespan is affected by advertisement type.

Viral campaigns in the past used engagement elicitations to trigger people's voluntary spreading. For a viral campaign to be successful, people who originally received the invitation (the seed) have to spread the invitation to his or her friends. To encourage such actions, firms facili-

tate people's motivations of participating in viral campaigns. In this paper, such motivation drivers are divided into two : engagement elicitation and incentive. Engagement elicitation stimulates internal motivation, while incentive reacts to external motivation. This distinction of motivation is supported by many motivation theories that divide motivations to internal and external and discuss the effectiveness of each (Deci and Ryan, 1985). Engagement in this paper defined as two-way interaction. Unilateral deliveries of information by companies are not counted as engagement. Facebook advertisements that include engagement elicitation would ask questions to their fans, or ask fans to share or comment on the post without promising monetary rewards. With more engagement inducements, it is expected to bring out more likes, comments, and shares from companies' fans, because it encourages some kind of feedbacks from the users.

H3 : SNS advertisements' effectiveness is affected positively by engagement elicitation.

H3-a : SNS advertisements' number of Likes is affected positively by engagement elicitation.

H3-b : SNS advertisements' number of comments is affected positively by engagement elicitation.

H3-c : SNS advertisements' lifespan is affected positively by engagement elicitation.

Incentive affects motivations that are more external. Incentives include offering monetary reward or gifts for spreading the viral campaign. In Facebook, companies can initiate viral campaign that provides gift or reward for liking or

commenting on the viral campaign posts. Usually fan pages with low awareness are likely to include incentives in their viral campaigns. Although incentive and engagement elicitation are both motivation drivers, this paper divided into two factors to find out which is more effective in affecting people's motivation.

H4 : SNS advertisements' effectiveness is affected positively by incentive.

H4-a : SNS advertisements' number of Likes is affected positively by incentive.

H4-b : SNS advertisements' number of comments is affected positively by incentive.

H4-c : SNS advertisements' lifespan is affected positively by incentive.

<Figure 3> depicts the research model and hypotheses of this research.

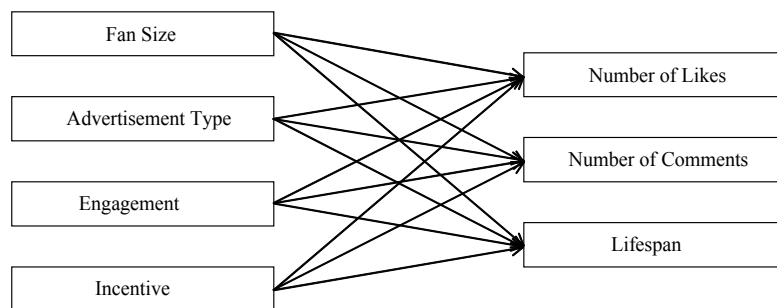
4. Research Method

This research focuses on one type of SNS, the Facebook. Facebook is ranked the most popular SNS in many surveys and the estimated unique monthly visitors at the time of September 2013 was 750,000,000, which is the triple of that of

Twitter, second popular social networking site. With its largest number of users, many firms have created their companies' Facebook pages and promoted their products and services through Facebook posts and links.

Beside its wide usage, Facebook includes some features that are very useful in collecting advertisement data. The date and time of the advertisement posting are recorded along with the date and time of every Facebook user's comments. Also number of likes and comments are reported. Number of fan size, or the number of people who liked the companies' Facebook page, is very useful in estimating the number of "seeds" in viral campaign.

Data is collected directly from companies' Facebook pages. To sample companies randomly, we used categorization of firms in Yahoo Finance Industry Center. Among nine sectors under Industry Index categorization, we only took consideration of Consumer Goods sector because it is the sector that actively interacts with customers and is likely to engage in SNS advertisements. Among Consumer Goods sector, we chose ten industries excluding industries regarding raw materials and ingredients, such as Auto parts and Farm products. Chosen industries include 1) Appliances, 2) Auto Manufacturers, 3) Beverages



<Figure 3> Research Model

-Soft Drinks, 4) Business Equipment, 5) Electronic Equipment, 6) Food, 7) Personal Products, 8) Processed and Packaged Goods, 9) Textile-Apparel Clothing, and 10) Textile-Footwear and Accessories. In each industry, we chose up to 5 firms to collect Facebook advertisements. Based on the Market Capitalization stated by the Yahoo Finance, we divided each industry into five quintiles. From each quintile, one firm is chosen randomly. Through this process, 50 firms are chosen as shown in <Table 1> (only three firms are chose from Appliances industry because only small number of firms exists in the industry).

After the companies are chosen, we collected Facebook advertisements that were posted between April 1st and April 15th 2013. Maximum of ten advertisements are collected from one company. If a randomly chosen company did not have a Facebook page or did not engage in Facebook marketing in that period, another firm is randomly chosen from the same quintile. Through this process, total number of 313 advertisement posts is collected.

From each viral marketing campaign, number of likes, number of comments, lifespan, advertisement type, existence of engagement elicitation, and existence of incentive are collected. Also from each company's fan page, the number of fans or fan size is collected.

For H1 and H2 (regarding number of likes and comments) robust regression is used due to the heteroscedasticity of the data and the existence of outliers (Yohai, 1987). Of 313 advertisement data, we could find some data with extraordinarily huge number of likes and comments. They were advertisements from bigger companies like Samsung or Nike. Residual analysis also showed that variances increased as the increase of dependent variables. For H3, the dependent variable lifespan is about how long the advertisement survives. So Cox model or proportional hazard model, which estimate the likelihood of an event occurring is adequate for analyzing H3 (Cox, 1972). In this case, the event will be the death of an advertisement.

<Table 1> Sampled Companies

Industry	Company Name
1) Appliances	Whirlpool USA, iRobot Roomba, ARCA
2) Auto Manufacturers	Bajaj Pulsar, General Motors, BMW, BYD, Kandi Technologies
3) Beverages-Soft Drinks	Coca-Cola Australia, IRN-BRU, Dr Pepper, SodaStream, Sealand Natural Resources
4) Business Equipment	Canon Pixma, VeriFone, Herman Miller, Virco, AURES Technologies
5) Electronic Equipment	Samsung Mobile, United Pacific Industries, Computime, Analytik Jena, IQ Power Tools
6) Food	Unilever, KRBL Ltd., Dole, Zooplus.de, Crumbs Bake Shop
7) Personal Products	Godrej Appliances, Gillette India, Nu Skin, LEIFHEIT Srbija, GKB Opticals
8) Processed and Packaged Goods	Campbell's Kitchen, Treehouse Brewing Company, Snyder's of Hanover, Farmer Brothers, Agfeed Industries
9) Textile-Apparel Clothing	Lululemon Athletics, Quiksilver, Crocodile, Delta Apparel, Barbara Bui
10) Textile-Footwear and Accessories	Nike, Liberty Shoes Ltd., Vera Bradley, Tandy Leather Factory, Kindy

5. Results

The descriptive statistics of the independent and dependent variables are given in <Table 2> and <Table 3>. The average lifespan is 17.44409 days, minimum lifespan was one day and the maximum number of days an advertisement lasted was 105 days. Also from <Table 3>, we can notice that most of the advertisements done in the Facebook took the form of image or photos. 82.75% of the advertisements were image, 9.27% consisted only with text, and 7.99% included videos. More than half of advertisements did not have engagement elements in them, and only 5.75% of the entire advertisement offered incentive to spread their viral campaigns.

<Table 4> shows the results of robust regressions with the number of likes and comments as dependent variables. Instead of number

<Table 2> Descriptive Statistics of Continuous Variables

Variable	Mean	Std. Dev.	Min.	Max.
Fan Size	2,225,654	5,341,695	38	22,395,603
Lifespan	17.44409	1.452538	1	105
Like	7,449.364	44,077.52	0	572,075
Comment	220.524	1,321.678	0	16,538

<Table 3> Descriptive Statistics of Categorical Variables

Variable	Category(Value)	Frequency(%)
Advertisement Type	Text(1)	29(9.27%)
	Image(2)	259(82.75%)
	Video(3)	25(7.99%)
Engagement Elicitation	Yes(1)	104(33.23%)
	No(0)	209(66.77%)
Incentive	Yes(1)	18(5.75%)
	No(0)	295(94.25%)

of likes, we used the logarithm of number of likes as dependent variable. The adjustment is made so that to reduce the residual standard error by significant level. From the table, we can see that the fan size, advertisement type, and engagement elicitation affect the number of likes in Facebook advertisement posts. Bigger the fan size, more number of likes is expected, and photo or image is expected to bring out more number of likes than other types of advertisements. Also companies' effort to bring out people's engagement is shown to be a positively affecting factor for number of likes. This proves H1-a, H2-a, and H3-a true and H4-a is not supported.

<Table 4> Results of Robust Regressions

Variable	Log Like	Comment
Constant	$2.778 \times 10^{0***}$	6.529×10^{-1}
Fan Size	$1.882 \times 10^{-6***}$	$4.593 \times 10^{-6***}$
Ad Type 1	-1.312×10^{-2}	2.766×10^0
Ad Type 2	$1.122 \times 10^{0***}$	$3.505 \times 10^{0**}$
Engagement Elicitation	$6.525 \times 10^{-1**}$	$4.509 \times 10^{0*}$
Incentive	1.862×10^{-1}	1.344×10^0
Robust residual standard error	1.801	8.437

Note) * 0.05 significance level, ** 0.01 significance level, *** 0.001 significance level.

<Table 5> Results of Cox Regression for Lifespan

Variable	Coefficient	Exponential Coefficient	Pr(> z)
Fan Size	-1.323×10^{-7}	1.000×10^0	$< 2 \times 10^{-16***}$
Ad Type 1	-4.687×10^{-1}	6.258×10^{-1}	0.0982
Ad Type 2	-9.572×10^{-1}	3.840×10^{-1}	$1.21 \times 10^{-5***}$
Engagement Elicitation	-6.002×10^{-1}	5.487×10^{-1}	$9.38 \times 10^{-6***}$
Incentive	3.915×10^{-1}	1.479×10^0	0.1349
R ²	0.376		

Note) * 0.05 significance level, ** 0.01 significance level, *** 0.001 significance level.

That is, existence of incentive did not influence the number of likes. For number of comments, fan size, advertisement type, and existence of engagement elicitation showed up to be affecting factors. Bigger fan size is likely to lead to more number of comments and photo or image was shown to be a better type of advertisement in regarding number of comments. Advertisement posts that encouraged engagements gained more comments. H1-b, H2-b, and H3-b are proven true, while H4-b did not turn out true as existence of incentive did not significantly affect number of comments. As shown in <Table 5>, regarding lifespan, the statistical analyses showed that fan size, advertisement type, and existence of engagement elicitation are affecting factors. This implies that bigger the fan size, if advertisement is image, or if engagement elicitation is included in the advertisement, the advertisement will last longer in people's News Feed. This proves H1-c, H2-c, and H3-c true.

Fan size, advertisement type, and engagement elicitation are affecting factors of all three sub-categories of advertisement effectiveness. Although we expected that advertisement type will affect the success of the advertisement, we expected that video will be the best format of advertisement. However, the result showed different; image turned out to be most efficient. Another unexpected result is that incentive did not affect marketing effectiveness. From this we can see that people are motivated through engagement elicitations or intrinsic motivation, but not by incentive or extrinsic motivation. The results coincide with the self-determination theory of motivation, which claims that the intrinsic motivation is more effective than extrinsic motivation (Deci and Ryan, 1985).

6. Implications

From the research results, we can deduct some vital implications on SNS viral marketing. By proving H1, fan size was shown to be a very important factor in SNS viral marketing effectiveness, in regard with number of likes, comments, and lifespan. This implies that just like the traditional viral marketing, initial seed size is important in SNS marketing as well. Therefore, there is a need for companies to expand their fan size before actively engaging in viral marketing. They could motivate people to become their fan by launching events, or focusing their marketing in persuading people to "like" their page and become fans. If conventional viral marketing was characterized by small-seed and exponential growth (Watts and Peretti, 2007), we can say that companies can expect better advertisement effect through large-seed and exponential growth in SNS environment.

Photo or image is shown to be a best format of advertising in SNS environment. This is quite unexpected as videos were expected to be a better method. In fact, creating video contents is much more expensive and takes much effort than creating image contents or writing an advertisement posts. This research suggests that video contents might not be as cost-efficient in SNS viral marketing. Nonetheless, videos can be a very powerful media of marketing in other channels, such as TV or video sites like YouTube. However in multimedia environment like Facebook, image is a better type than video. To give a reason to why such unexpected result showed up, we attribute on how the video contents are shown in Facebook. Facebook and other multimedia social networks present a video content

with a representative image and a play sign. Users have to click play to actually see the video and enjoy the content richness. However before people click to watch the video, what people see is just the representative image, which is not much different from image type advertisements. In a face paced environment like SNS, people are likely to just see the image and skip the video without having to take another step of clicking and watching.

Another important implication of this research is that it showed that the existence of engagement elicitation affects advertisement effectiveness, but not the existence of incentive. This directly relates to self-determination theory of motivation. People are more likely to spread a viral campaign because it's fun, not because it offers some gifts or monetary compensation. The result is consistent with a research on people's motivation to pass along viral marketing e-mails. Phelps et al. (2004) wrote that people's biggest motives were intrinsic motivation such as "because it's fun," "because I enjoy it", or "because it's entertaining" and extrinsic motivation such as "to get something I don't have" ranked 15th in motives (Phelps et al., 2004). Similar to e-mail viral marketing, people are also motivated to spread viral campaign in SNS viral marketing by intrinsic motives. Therefore in utilizing SNS viral marketing, it is important that firms include factors of engagement in their advertisements rather than incentives. By asking their fans questions or asking people to participate in their events, companies can enjoy cost-efficient marketing success rather than by offering monetary incentive for spreading viral campaigns.

From the result, we could compare and contrast the e-mail viral marketing and SNS viral

marketing. They are similar in how people are motivated to spread and participate in viral campaign. Study on people's motives to spread e-mail viral marketing showed that people spread viral e-mails for their enjoyments (Phelps et al., 2004). People are motivated by intrinsic motivations, while extrinsic motivations such as gifts were not as important motivations. This research proved that people's motives are not different in SNS viral campaigns. People reacted to advertisements that induced engagements, but was not affected by incentives. However, e-mail viral marketing and SNS viral marketing have some significant differences. First of all, seed size is very different. E-mail viral marketing's initial seed size is restricted to a company's e-mail lists. However in Facebook or other SNS environments, companies have large seeds. Advertisements easily reach to their fans, which can be up to millions, and the spreading starts from there. Time decay is a much more important issue for SNS viral marketing. In e-mail viral marketing, number of people an e-mail reaches increases as time passes, if the reproduction rate is bigger than one (Watts and Peretti, 2007). However in Facebook, advertisement posts cannot be spread to other people if certain time passes. Although companies can delay the time by encouraging people to like and comment on the post, but because time decay is an important factor in News Feed algorithm, advertisements will disappear over time. Other major difference relates to communication model. E-mail viral campaign can be explained by linear communication model, where companies send e-mails to their customers, who will then deliver the invitation to their friends. However SNS viral marketing is transactional, in that customers also send feedback to the com-

pany that affects other people receiving the advertisements. This happens in a same platform, where firms and many people who saw the advertisement directly exchange opinions.

7. Conclusion

This research studied factors that affect SNS viral marketing effectiveness. By collecting advertisements from Facebook, this research showed that fan size, advertisement type, and engagement elicitation influence advertisement success in SNS. We operationalized the SNS viral marketing effectiveness as three dependent variables including number of likes, number of comments, and advertisement lifespan. This research applied the concepts of conventional viral marketing to the SNS environment. Through statistical analyses, fan size was the most influential factor in SNS marketing success. Image is shown to be the most effective type of advertisement in multimedia SNSs, and inducement of engagements is more effective than incentives.

Besides the contribution of this research to practitioners that are introduced in the Implication section, this paper also proposes significant implications to the academia. This research tries to propose a theoretical model for SNS viral marketing success by modifying previous models from e-mail viral marketing. We also clarified the differences between the previous online viral marketing and the SNS based viral marketing.

There is lots of room for further research as SNS viral marketing is a field that is not yet perfectly understood. More research could be done to better understand advertisement effectiveness in SNS, or how marketing should be different in SNS environment. However, further

research with priority would be researches on marketing using multi-channels. Companies do not solely rely on SNS marketing nor solely commit their advertisement in one channel. In fact, companies engage in viral marketing in Facebook, upload videos in YouTube, and post advertisement in newspapers at the same time. As this research is only focused on one channel, the SNS, more research is needed to understand how companies should manage their multi-channels for marketing. By studying how different each channel functions, the relationships between channels, and people's perception toward each channel, companies can focus each channel to specialized tasks and integrate channels for their marketing purposes. Also, more researches on spreading model in SNS viral marketing can be done. As many researches tried to understand and accurately estimate the spread of viral campaign in e-mails (Hogan et al., 2004; van der Lans et al., 2010), more study on the process model of spread in SNS viral marketing will inform researchers and practitioners the precise spreading coefficients.

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