

Understanding Online Message Dissemination:

An Analysis of "Send this message to your friend" Data

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Abstract

Our goal in this paper was to analyze "send-this-story-to-a-friend" data. Encouraging consumers to send stories to friends is an application of viral marketing which envisions message dissemination through customer-to-customer communication rather than firm-to-customer communication. It makes sense for a publisher to include this feature since individuals are more likely to accept the recommendations of their friends and this may increase their probability of reading the story by making it more salient.

We collected publicly available data from ESPN.com over an 11-day period. Using this data, our findings are: first, the number of times stories are sent out represent a miniscule proportion of visits to the site; second, if the top story is very influential, it may increase the total visits to the site and there may be spillover effect; third, there is an interesting weekend effect with a drop in the number of stories sent out; and, finally we observe an interesting floor effect when we analyze the ratio of the top and bottom stories.

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Introduction

News sites on the Web are increasingly finding it difficult to attract consumers on a consistent basis. The reasons for this are many. There is increased competition on the Internet among previously unique news providers such as newspapers (e.g. nytimes.com), magazines (e.g. time.com) and TV (e.g. cnn.com). There is a paucity of unique news content since most media outlets use standard wire services such as the Associated Press (AP). Moreover, offline media continue to offer serious competition to Internet news services.

This is an especially troublesome fact since most news sites rely on advertising revenue to sustain themselves and advertising rates are a function of the quantity of traffic [1] to a site. At one point, there was a move to shake off this dependence on advertising by charging subscriptions, notably, by Microsoft's Slate.com. Unfortunately, the results were disastrous and now, except for the

rare exception (notably, the Wall Street Journal at wsj.com) the reliance on advertising is considered a fait accompli.

Many techniques for building customer traffic on the Internet have proved to be ineffective. For example, banner ads for the most part do not generate high traffic because of dismal click-through rates. Moreover, a recent eye-tracking study presents troublesome evidence that Internet users may "actually avoid looking at banner ads during their online activities" (Dreze and Hussherr, 1999). If this is true, then placing banners around Web content may be a poor way of delivering the message. Search engine optimization could help but increasingly, search engines tap into smaller and smaller fractions of the overall Web (Lawrence and Giles, 1998) with no engine capturing more than 16% of the Web content (Lawrence and Giles, 1999).

Of course, most online news sites do not have the resources to advertise offline in media such as television. Some are lucky to have tie-ins with their offline counterparts (e.g. abcnews.com, Espn.com) to generate traffic. But, this seems to be the exception rather than the rule.

Overall, it is fair to say that managers of news sites feel great pressure to build and sustain customer traffic. One of the ways of overcoming this conundrum has been through viral marketing (Krishnamurthy, 2001). This technique proposes leveraging customer networks to build traffic. The most common manifestation of this in the news business has been the addition of the "send-this-story-to-your-friend" link to most stories. This is seen as a relatively inexpensive way to build incremental traffic to a site. As shown in Table 1, many large news sites worldwide have now adopted this feature. Examples in the United States include nytimes.com and washingtonpost.com.

Table 1
Comparison Of E-mail Capability in Online News Sites

Rank	News Site	E-mail Article	# of Addresses in Form	Add Comments To Story	Most E-mailed Articles
1	nytimes.com	Yes	1	Yes	Yes, but no numbers
2	washingtonpost.com	Yes	Unlimited	Yes	No
3	Salon.com	Yes	1	Yes	No
4	Slate.com	Yes	Unlimited	Yes	No
5	Boston.com	No	not available	not available	not available
6	ABCnews.com	Yes	1	No	No
7	MSNBC.com	No	not available	not available	not available

8	usatoday.com	No	not available	not available	not available
9	villagevoice.com	Yes	1	Yes	No
10	Economist.com	Yes	1	Yes	No
11	The Straits Times (Singapore)	Yes	1	1	No
12	ESPN.com	Yes	1	Only if registered user	Yes, with numbers

However, little is known about the fundamental nature of this phenomenon. Hence, this paper is a first attempt at analyzing "send-this-story-to-your-friend" data. We use publicly available information from ESPN.com, the leading sports news site, to understand temporal patterns in "send-this-story-to-your-friend" data.

Brief Introduction to Viral Marketing

Viral marketing proposes that messages can be rapidly disseminated from consumer to consumer leading to large-scale market acceptance. Marketers are now asked to view markets as networks of consumers rather than an amorphous mass and use this knowledge to enhance the spread of their message. There are three "flavors" of viral marketing:

Incidental contagion

In this case, the consumer is not explicitly made aware of his or her role in the message dissemination process. Consumers sign on to a service and in the process of using the service unwittingly increase awareness of a product. Consumers do not perform any special promotional tasks and do not receive any reward.

Hotmail is an example of incidental contagion; it grew by leaps and bounds by doing something simple. At the bottom of each e-mail message, there was a small line promoting Hotmail: "Get Your Private, Free Email at <http://www.hotmail.com/>." Recipients of these messages quickly understood that they could get an account easily by visiting the Hotmail Web site. This led to phenomenal growth, with more than 12 million people signing up in the first 18 months for a Hotmail account. Hotmail spent only \$500,000 on marketing and promotion during this period, or acquisition cost of about four cents per customer.

Contagion due to transaction consummation

Typically, in this case, a firm makes an attractive product available for free provided all interested parties register for the service. In other words, a service is available to individual x only if others (ranging from one other person to many others) sign up. As a result, x has an incentive to persuade others to sign up as

well, leading to rapid growth. The two classic examples of this are ICQ and PayPal.

Real-time chat service ICQ (short for "I seek you") signed up 12 million users by using this approach. In order to chat with your friends, they had to have the service too. Those friends signed up their friends and ICQ eventually sold out to AOL for about \$300 million.

More recently, PayPal, which allows users to make small payments to one another online, followed a similar path by paying its early users \$10 to sign up, and a few more dollars for each new member they referred. People liked the service, and it pulled in more than three million users in its first nine months. Once a critical mass was reached, PayPal scaled back its payments to \$5.

Consumers as professional recruiters.

In this case, consumers are encouraged to contact others and inform them about the product. There are two different versions of this. In the first approach, no incentives are provided to the consumer. For example, the "tell your friend" icon right next to a product display or a news story. The second approach is perhaps the most aggressive. In this case, an explicit incentive structure is set up to reward consumers who bring in most traffic.

Theoretical Underpinnings of Sending Stories to Friends

Conceptually, one may ask why a news site must adopt this approach as opposed to traditional advertising. The first argument could be from a targeting standpoint. A news site has imperfect information about the preference structure of its consumers. On the other hand, friends of consumers are much more likely to know the type of story that will excite specific individuals. Put otherwise, a friend is likely to be a better predictor of an individual's taste as opposed to a firm that does not know a given person. In addition, some studies have shown that consumers are more likely to trust a recommendation made by a friend rather than a corporate representative (Martin and Clark, 1996). This is especially true for digital products such as news which have experience attributes (Nelson, 1970), that is whose quality cannot be ascertained unless one experiences (reads) it.

As a result, when a friend sends a story along, the story is likely to be better targeted to the needs of the consumer. This argument is particularly strong for a site with a wide variety of content. For example, ESPN.com covers at least 16 major sports many at the collegiate and professional levels. Here, the cost of learning customer preferences in all categories could be very high for the firm. Hence, it would make sense to adopt the send-to-a-friend approach.

The second argument is based on salience. Even though a consumer may be interested in a particular story, he or she may not find it on a site. This could be due to a variety of reasons such as the volume of information provided at a site, delay in the consumer's visit to the site, a recent change in site layout, etc. Since e-mail is a direct communication vehicle, the consumer is much more likely to pay attention when the story is e-mailed to him or her from a friend.

Of course, many news sites (e.g. nytimes.com, slate.com) have realized the increased salience of e-mailed links. Hence, they offer their own e-mail newsletters. But, once again, receiving it from a friend may make a consumer pay more attention to it.

The third argument may be made on the basis of customer influence.. All individuals are not created equal. Some have a greater sense of curiosity and also, a greater need to spread market information. Such individuals are referred to as market mavens (Feick and Price 1987). Hence, there is a self-selection process here where consumers who have a greater interest avail of this service and act as marketing agents in spreading the message. All the news site has to do is reduce the transaction costs of spreading the message.

Mavens have always diffused information. However, now due to the greater connectivity engendered by the Internet, the importance of their role has only increased.

Data

ESPN.com recently made available information about the number of stories that were sent out the most in the last 24 hours. An example is provided in Table 2. It is very diverse. In other words, the types of stories that were being distributed were from a variety of sports. This was especially encouraging since we collected this data during the NCAA basketball season ("March Madness").

Table 2
Sample of Data Used- Collected on 25 March 2001, 5:42 PM Western (USA) Time

RANK	SUBJECT	SENT
1	Henson signs with Yankees for \$17M	214
2	NCAA Recap - Maryland 87 , Stanford 73	174
3	Nine of the 10 selected have played in Games before	124
4	Win is Sadler's first in Winston Cup	118
5	NCAA Recap - SW Missouri St 81 , Duke 71	114
6	Kwan rules Worlds for a fourth time	84
7	NCAA Recap - Duke 79 , USC 69	83
8	Battier back for one Final act	78
9	Heisley reportedly prefers move to Memphis	76
10	De La Hoya returns with fifth-round KO	74

11	NCAA Recap - Xavier 80 , Tennessee 65	71
12	Bird 'explodes' after flying in path of fastball	67
13	Henson has 'star power' in football	60
14	Bibby may show interest in UNLV job	56
15	Stiles scores 41 points in Lady Bears' upset	54
16	All ACC, all the time	34
17	NCAA Recap - Michigan St 69 , Temple 62	31
18	NHL Recap - Pittsburgh vs New Jersey	31
19	Men's NCAA Tournament 2001 Bracket	31
20	Owners reluctant to realign	29
21	Zenmaster flash	26
22	Wright favorite to replace Lappas at 'Nova	24
23	Bourque doesn't stumble in Boston return	23
24	NCAA Recap - Connecticut 72 , No Carolina St 58	21
25	Bodine admits returning too quickly	21

As shown in Table 1, this kind of information is very rare. Most online news sites do not provide this information publicly. Some do, but do not provide the actual numbers for each story. Hence, the ESPN.com data provides a rare glimpse into the interactions among actual consumers.

We collected this data over a period of 11 days. The data was collected at least once a day and on average, twice a day. Table 3 provides a list of dates and times when the data was collected

Table 3
Dates and Times When the Data Collected
(All are Western (USA) Time)

Observation number	Date	Day of week	Time
1	14 March 2001	Wednesday	12 Noon
2	15 March 2001	Thursday	12 Noon

3	16 March 2001	Friday	9 AM
4	16 March 2001	Friday	11:30 AM
5	16 March 2001	Friday	2:59 PM
6	17 March 2001	Saturday	5:36 PM
7	18 March 2001	Sunday	8:17 AM
8	19 March 2001	Monday	7:51 AM
9	19 March 2001	Monday	10:20 AM
10	19 March 2001	Monday	2:57 PM
11	20 March 2001	Tuesday	9:20 AM
12	20 March 2001	Tuesday	11:58 AM
13	20 March 2001	Tuesday	2:57 PM
14	20 March 2001	Tuesday	11:33 PM
15	21 March 2001	Wednesday	9:25 AM
16	21 March 2001	Wednesday	12:26 PM
17	21 March 2001	Wednesday	7:30 PM
18	22 March 2001	Thursday	6:37 AM
19	22 March 2001	Thursday	11:51 PM
20	23 March 2001	Friday	8:09 AM
21	24 March 2001	Saturday	7:40 AM
22	24 March 2001	Saturday	6:18 PM
23	24 March 2001	Saturday	8:49 PM
24	24 March 2001	Saturday	5:44 PM
25	25 March 2001	Sunday	10:01 AM

Suppose we knew the number of times a particular story was sent by people to their friends, what would that tell us? First, it presents a lower boundary for the number of people who have been intimated of the story. The "send-the-story-to-your-friend" link merely reduces the transaction cost of transmitting the message. However, that does not mean that everybody will follow this method. Some individuals may have simply copied the link and added it to an e-mail message themselves.

Second, the number of people who have become aware of a story may be much greater. For example, individuals could forward stories they receive to others. Hence, when you measure the number of people who e-mailed their friends, you are measuring only link a in Figure 1.



Figure 1: A consumer passes on news from site to a peer. The peer may pass the message on to a larger community who can then pass it on to others.

Results

First, we studied the temporal trend in the total number of times stories were sent out. This was computed by adding the numbers against each of the 25 stories. Of course, it is an imperfect measure but it provides a lower boundary of the total number of stories disseminated. The results are shown in Figure 2.

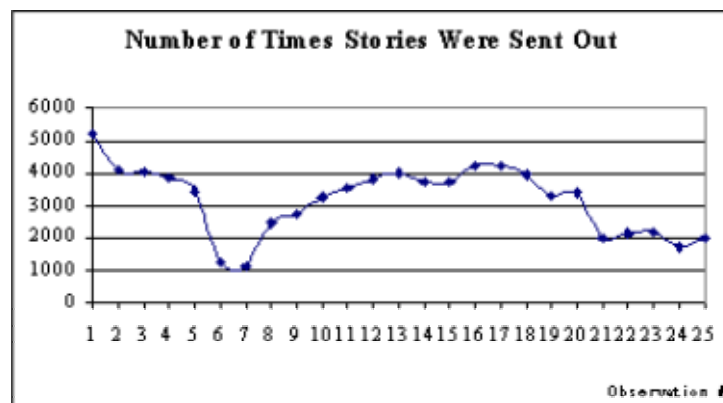


Figure 2

There are several interesting observations that need to be made here. A recent story in the Wall Street Journal puts the number of unique visitors to ESPN.com in the month of February 2001 at 6.1 million. Hence, it is very interesting to note that the total number of times stories sent out never exceeds 5,500. Even if we assume that each instance of a story being sent out was by a unique individual, this represents a miniscule percent of the number of unique visitors to the site.

Next, note that there are clear troughs in the data (observations 6,7 and 21-23). These troughs appear to be because of a weekend effect. Since most sports

activity peaks at the weekend, it is likely that individuals watch games over the weekend and return to the site (perhaps from their office) to read about it and pass it on to their friends on Monday.

Figure 3 presents the time trend of the number of times the top story was sent out to friends. For the most part, this mimics patterns in Figure 2 although there is greater variability in the data. The top story can represent a significant proportion of the total number of times a story was sent out. During the time period we studied this, on average, the top story represented 19.01% of all stories, the maximum being 30.33%.

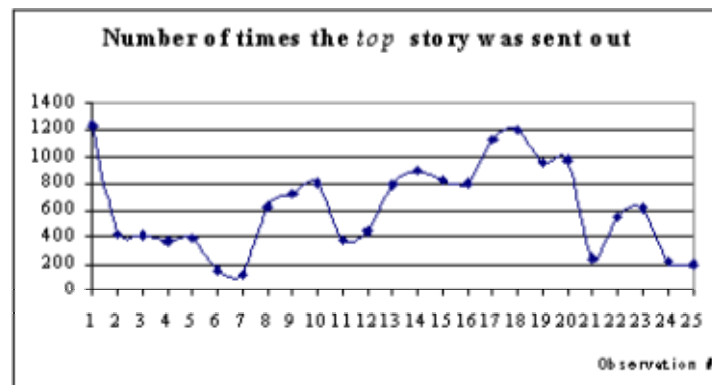


Figure 3

In some cases, it appears that the top story has the ability to raise the total number of times stories were disseminated. For example, in Figure 2, observation 1 clearly stands out from the rest. On closer examination, we see that this is because in Figure 3, the number of times the top story was sent out was over 1,200 times, a high number. It is no wonder that this was the case since this top story was a rumor about Michael Jordan making a comeback as a basketball player.

This is also consistent with the standard deviation data shown in Figure 4. For observation no. 1, the standard deviation is very high since this one story stands out from the rest. However, over the weekend (observations 6-7, for example), not only are the total number of times a story is sent out low, but the stories are all bunched together.

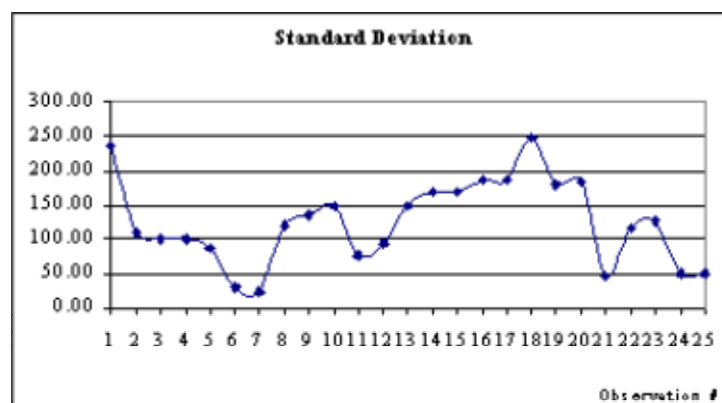


Figure 4

Also, there may be a spillover effect due to the top story. Users who are exposed to the top story may visit the site and then stay on to read other stories. They may even forward it to their friends. We have limited evidence for this. For example, comparing observation no. 1 with no. 2, the number of times stories 2 to 25 were sent out were greater by about 7%. Similar results are found comparing no. 1 and no. 3.

Finally, we considered one other measure of the influence of the top story, that is the ratio of the number of times the top story was sent out to the number of times the no. 25 story was sent out. This is shown in Figure 5. One interesting fact here is that it seems that there is a floor effect with the ratio never dipping below 5. At the other extreme, the ratio is sometimes as high as 25, a sign of the influence of the top story as well as the lack of influence of other stories.



Figure 5

Conclusion

Our goal in this paper was to analyze "send-this-story-to-a-friend" data. We collected publicly available data from ESPN.com over an 11-day period. Using this information, we found that the number of times stories are sent out represent a miniscule proportion of visits to the site. Second, if the top story is very influential, it may increase the total visits to the site and there may be spillover effect. Third, there is a weekend effect with a drop in the number of stories forwarded. Finally, we observe an interesting floor effect in the ratio of the top and bottom stories.

These observations are constrained by the limited information available to us. Most news sites are not interested in sharing information of this nature thanks to the competitive nature of the online news sites. With more complete information, we could study the relationship between "send-this-story-to-a-friend" data and site traffic metrics (e.g. impressions, visitors). Our conjecture is that the correlation between the two would be very high and the total number of times a story is sent out could be treated as another variable that must be factored into managerial decision-making. Future studies must examine the number of people sending out stories - and not just the number of times it is sent out. It would also be interesting to see if providing individuals incentives will increase the number of stories sent out.

The very small volume of information in comparison to total visits to a site (if the report by the Wall Street Journal is accurate) also needs to be investigated across a variety of sites. On the one hand, if it is well correlated with traffic it may only represent market mavens sending messages. On the other hand, it may not prove to be diagnostic. This may also be different in small, local news sites as opposed to major, national sites.

Overall, this area needs further research. Our hope is that more empirical studies will help us understand this phenomenon better.

About the Author

Sandeep Krishnamurthy is Assistant Professor of Marketing in the Business Administration Program at the University of Washington in Bothell, Wash. His current research interests include P2P business models, online communities, permission marketing, viral marketing, personalization, spamming, and privacy. He teaches E-Marketing and Internet Business Model Lab to undergraduates and E-Commerce to graduate students. He invites you to initiate an e-conversation on this paper or his other research interests.

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Note

1. Unfortunately, advertisers do not care for the quality of traffic.

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