

# **Viral Marketing for the Real World**

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## **Summary**

In spite of the recent popularity of viral marketing, we argue that most big companies should not rely on it to spread the word about their products and brands. Instead, we propose a new model called “Big Seed Marketing” that combines the power of traditional advertising with the extra punch provided by viral propagation. Between traditional advertising and viral marketing is an important gap that can be filled by big companies looking for an advantage in the market place and a better return on their advertising and marketing dollar.

## **Introduction**

Viral marketing has generated a lot of excitement in recent years, in part because it seems like the ultimate free lunch: Pick some small number of people to “seed” your idea, product, or message; get it to “go viral”; and then watch while it spreads relentlessly to reach millions, all on a shoestring marketing budget.

Adding to this intuitive appeal, viral ideas, products and media also make compelling stories. “Flash mobs”, started by Bill Wasik as something between a social experiment and an art project, became popular in New York City in the summer of 2003, and then spread around the world as imitators as far afield as Asia, Europe, South America, and Australia copied Wasik’s idea. Amusing videos like the “Star Wars Kid”, and entertaining or controversial websites like Jib Jab’s 2004 election spoof and “blackpeopleloveus.com” also started from small initial groups of people and ultimately attracted millions of unique visitors, often generating additional exposure from an interested mass media. And viral email forwards, like one initiated by a customer who ordered Nike shoes customized with the word “Sweatshop”, or another describing an intimate exchange between a London lawyer and his one-time girlfriend, made news headlines and generated considerably notoriety for its authors, after reaching a global audience of millions via word-of-mouth networks.

## **No free lunch**

Viral marketing, however, is much easier to tell stories about than to implement. For every high profile example of a viral product, there are many more unsuccessful attempts

that one never hears about. Moreover, predicting which of these attempts will succeed and which will not is extremely hard, if not impossible—even for experienced practitioners. After the fact, it is usually possible to understand what was entertaining, titillating, or otherwise intriguing about a given viral entity; but it is rarely obvious in advance. For example, in a recent “contagious media” contest conducted by the media-art nonprofit Eyebeam.org, a roomful of subject-matter experts failed to predict which of 60 submitted websites would generate the most page views. Even creators of successful viral projects are rarely able to repeat their success with subsequent projects. Indeed, looking across a wide range both of successful and also unsuccessful attempts over the past several years, there is little in the way of attributes to which one might ascribe consistently viral properties. As a result, it is extremely difficult, and perhaps impossible to consistently create media that will spread virally from a small seed to millions of people.

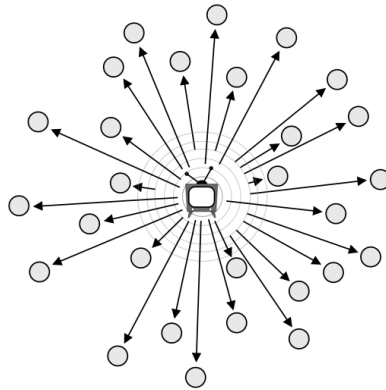
Thus as appealing as the viral model of marketing seems in theory, its practical implementation is greatly complicated by its low success rate—a problem that is exacerbated by the constraints imposed by the commercial, political, or social agendas inherent to marketing campaigns. One may need to design and conduct dozens or even hundreds of such campaigns before one of them succeeds; and even if a campaign is successful at spreading it still might not propagating the desired message of the advertiser.

Fortunately, it is possible for media companies to benefit from the insights of viral marketing, while avoiding its most serious pitfalls. We propose an approach called “Big Seed” marketing that combines viral marketing tools with old-fashioned mass media in a new and creative way. The result is still not a free lunch, nor is it a magic bullet, but it can generate returns on investment that are nevertheless impressive, and far more predictable than purely viral approaches. To understand how such hybrid strategies work, we first explain briefly the essential difference between mass and viral marketing.

### **Mass Marketing vs. Viral Marketing: A primer**

The standard model of mass marketing is roughly like the schematic presented in Figure 1. A particular Ad buy will expose the client’s message to some large number of people, say  $N$ . Of that number, the reasoning goes, each individual will respond to the message in a positive way (say, by purchasing the product, changing their behavior, or simply developing a favorable impression of the brand) with some probability,  $P$ . The total expected number of “conversions” generated by the investment in the ad buy is simply  $n = pN$ . Traditional marketing, therefore, is essentially a matter of increasing either  $P$  (by creating persuasive, informative, targeted, entertaining, or simply memorable ads), or

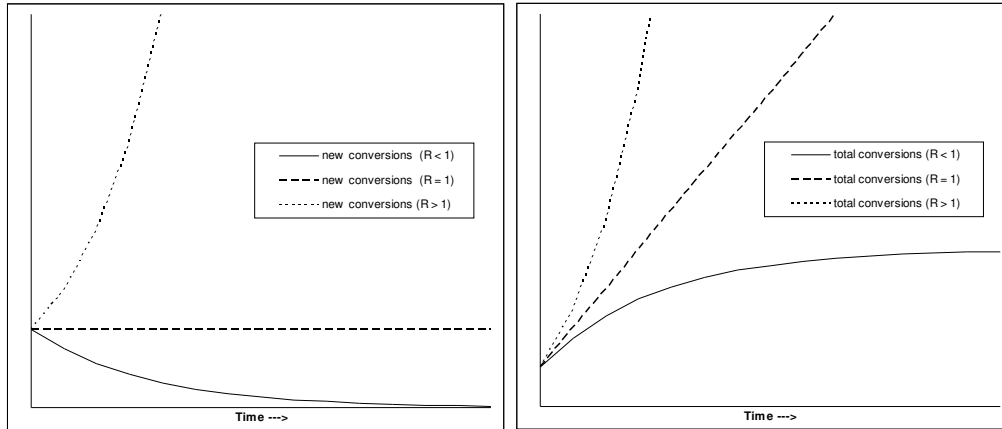
$N$ . (by exposing the ad to as many potential converts as possible).



**Figure 1. Mass marketing schematic**

The standard model of viral marketing is quite different. Now the assumption is that one starts with a very small “seed” of individuals who spread a message by sharing it with their friends. In the simplest case, each word-of-mouth transmission occurs with some constant probability  $\beta$ . If each person spreads the word to  $z$  others, on average, then the expected number of new converts generated by each existing one is  $R = \beta z$ , which is called the “reproduction rate” in simple epidemiological models. More realistic “social” models of contagion take into account, for example, an individual’s memory, or the number of times they need to hear about something before deciding to pass it on. But even in these more complicated cases, one can still compute an effective reproduction rate.

The reproduction rate is important, because if  $R > 1$ , then each person who gets the message, on average, will spread it to more than one additional person, who then does the same thing, and so on, leading to exponential growth in the number of people who have received it (Figure 2, dotted lines). On the other hand, if  $R < 1$  (Figure 2, solid lines) then any small, initial seed will invariably burn itself out before many additional people get the message. Finally,  $R = 1$  (Figure 2, dashed lines) is a special “critical” case where the outbreak changes character from exponential collapse to exponential growth. Epidemiologists therefore call  $R = 1$  the “epidemic threshold”, and in public health, the goal is to reduce  $R$  below 1 in order to stop epidemics. In viral marketing, however, where  $R = 1$  is usually called a “tipping point” or sometimes a “phase transition,” the opposite pertains: in order for something to “go viral,” or “tip,” it needs to have  $R > 1$ .



**Figure 2. Viral growth as a function of time and the reproduction rate  $R$ . Left panel shows new conversions, and right panel shows total (i.e. cumulative) conversions.  $R > 1$  (dotted lines) leads to exponential growth;  $R < 1$  (solid lines) leads to exponential decay; and  $R = 1$  (dashed lines) represents the critical “threshold” case of neither growth nor collapse.**

The problem, of course, is that designing something to have an  $R > 1$  is no mean feat. Not only must each individual, on average, pass it on to more than one new person—at least one of those people must in turn be motivated to pass it on again, and so on. Successful infectious diseases all have  $R > 1$ , but there are relatively few such diseases, and they are the products of millions of years of evolution and natural selection. Marketers, by contrast, are trying to come up with viral products every day. The chances are, therefore, that even talented creatives will typically design products that exhibit  $R < 1$ , no matter how hard they try.

### **Big Seed Marketing**

Typically, contagious entities with  $R < 1$  are not considered interesting. The reason is simple: disease outbreaks almost invariably commence with a single person, often called the index case, or “patient zero.” Thus epidemics of disease, including well known viral epidemics like SARS, Avian flu, and HIV1 and 2, can only grow to infect more than a small number of people if they exceed the epidemic threshold. And because our mental model of viral marketing is derived directly by analogy with biological viruses, the same conclusion is usually applied to viral marketing campaigns—if it doesn’t “go viral” it is effectively a failure.

There is an important flaw in this analogy, however: Big companies, unlike biological diseases, can use mass media advertising to create a potentially enormous seed of index cases. The main consequence of this simple observation is that even if  $R < 1$ , the contagious process may require several steps to burn itself out, during which time a quite respectable number of additional people may have been reached.

Here's how it works. Imagine an advertising firm purchases an ad-buy on the web, generating  $N$  page views, and that some fraction  $p < 1$  of viewers are sufficiently interested to click on the displayed ads. Typically, that's all an ad-buy would be expected to achieve, yielding  $n_0 = pN$  "conversions," just as in any standard mass-media campaign. But imagine that viewers who click on an ad can now share it with friends, colleagues, or anyone else whom they think might find it interesting, informative, or simply entertaining—in other words, what would otherwise be the entire audience for a product now becomes, in addition, the "seed" for a potentially viral campaign. If each member of this seed contacts an average of  $z$  new people—that is people who would not otherwise have seen the relevant ad—and some fraction  $\beta$  of these contacts in turn clicks through to the ad, then the campaign has now reached a total population of  $n_1 = pN + \beta zpN = pN(1 + R)$ .

Now, of course, there is nothing to stop the newly added people from also forwarding the message to *their* friends, who may forward it to their friends in turn, and so on. Allowing this process to proceed indefinitely, we have  $n = pN(1 + R_0 + R_0R_1 + R_0R_1R_2 + \dots + K)$ , where  $R_i$  is the reproduction rate at the  $i^{\text{th}}$  remove from the initial seed. In general, there is no reason to expect the  $R_i$  to be equal, because individuals who are contacted at different stages may well behave in systematically different ways (individuals who click through from a web site, for example, may be motivated to contact more or fewer people than someone who has been sent a message by their friend). But if we make the simplifying assumption that all participants respond in more-or-less the same way, we can write the above expression as  $n = pN(1 + R + R^2 + R^3 + \dots + K) = pN/(1 - R)$ .

So, for example, if some campaign exhibits an  $R = 0.5$ , placing it well below the "viral" threshold, the final population reached  $n = 2n_0$ , or twice the number that would have been reached in the absence of consumers sharing the ad media. For the same sized investment, in other words, the advertiser gets 20 pairs of eyeballs for the price of every 10. Even a reproduction rate closer to zero—say  $R = 0.1$ —will generate more than a 10% gain in eyeballs reached—still a respectable improvement on traditional advertising.

### **Big seeds work**

Such “big seed” viral campaigns are not merely hypothetical—in the past two years, the open-source software ForwardTrack, developed at Eyebeam, has been deployed successfully by a range of commercial and non-commercial marketing campaigns. ForwardTrack works by augmenting standard online “tell-a-friend” functionality with geographic and social network tracking. Each participant in a ForwardTrack campaign can see their impact in terms of how many of their friends, friends-of-friends, etc. have participated, and see that impact animated on a national map.

Although it was originally designed to foster truly viral spread, none of the campaigns that have used ForwardTrack have succeeded in “going viral”, in the sense of growing exponentially from an initial seed—that is, of consistently exhibiting  $R > 1$ . Nevertheless, by combining the viral capabilities of ForwardTrack with large initial seeds, *all* the campaigns succeeded in reaching larger populations than they had previously had access to.

For example, in 2004 StopTheNRA and the Brady Campaign launched Tom’s Petition—an appeal for common sense gun control that was started by Tom Mauser, the father of Daniel Mauser, who was killed in the Columbine shootings. As indicated in Table 1, Tom’s Petition exhibited an  $R = .583$ , enough to more than double the size of the campaign.

Following the success of Tom’s Petition, Proctor and Gamble incorporated ForwardTrack into a viral campaign to promote Tide Coldwater as an energy-efficient alternative to regular washing detergents. As one might expect for a campaign about laundry detergent Tide Coldwater registered a lower  $R = .041$ . But because the campaign was initiated with such a large seed – over 900,000 – the Tide Coldwater Challenge still reached an additional 40,000 individuals.

The Oxygen Network, a for-profit cable channel that “puts a fresh spin on television for women” (<http://getoxygen.cablesources.net/>), used ForwardTrack to power an advocacy portal called Oh! Speakup. One of its campaigns, in which Oxygen agreed to donate \$1 for every participant (up to \$25,000) to hurricane Katrina relief, exhibited the highest  $R$  we have seen to date –  $.769$  – leveraging an initial seed of 7,064 into an additional 23,544 participants.

Several examples of successful ForwardTrack campaigns are summarized in Table 1, which lists the campaign name, the size of the initial seed, the final population reached,

and the corresponding values of  $R_i$ . Notice that the closer the reproduction rate of the campaign is to the critical value of  $R = 1$ , the longer it will persist for, and the higher the gain; thus the smaller the required seed population. Big seeds limit risk and high values of  $R$  expand growth.

**Table 1. R values and total gain**

Degree of Separation from Root	StopTheNRA: Tom's Petition	Oxygen Network: Katrina Benefit	P&G: Tide Coldwater Challenge <sup>4</sup>
1 (Seeds)	22,582 <sup>1</sup>	7,064	960,954
2	10,698	5,298	34,679
3	6,979	4,087	4,846
4	4,798	3,533	913
5	9,115 <sup>2</sup>	2,403	188
6		2,374	38
7		2,039	12
8		1,431	3
9		899	
10		593	
11		481	
12		233	
13		91	
14		55	
15		21	
16		4	
17		2	
<b>Seed</b>	<b>22,582</b>	<b>7,064</b>	<b>960,954</b>
<b>Total Reached</b>	<b>54,172</b>	<b>30,608</b>	<b>1,001,633</b>
<b>Bonus</b>	<b>31,590</b>	<b>23,544</b>	<b>40,679</b>
<b>Gain</b>	<b>2,399</b>	<b>4,333</b>	<b>1,042</b>
<b>R</b>	<b>0.583</b> <sup>3</sup>	<b>0.769</b>	<b>0.041</b> <sup>5</sup>

<sup>1</sup> Tom Mauser actually reached 29 friends at the 1st degree. One of his 'friends' was StopTheNRA, who sent a large email blast that we consider here as the seed layer.

<sup>2</sup> Tom's Petition grouped all degrees past the 6th together. By memory it actually went to at least 12 degrees.

<sup>3</sup> Within this tree there are subtrees with higher R values that did not originate from the seed layer. However, they consisted of less than 10% of the total and the source data is lost so we consider them as part of the seeded effort.

<sup>4</sup> This campaign had 4 different seedings that occurred at different levels of the campaign. For simplification purposes, we have broken out the trees independently and re-summed them by degree

<sup>5</sup> Because of the size of P&G's email lists, there were numerous technical difficulties, including server capacity, that hindered the natural growth of the campaign. It is possible that R would have been even higher.

Table 2 describes similar results from a separate campaign, conducted recently by the Huffington Post, a prominent web log / news site, and JWT, one of the largest and oldest ad agencies in America. In an unusual experiment, JWT purchased all advertising space on the Huffington Post for one week, in order to guarantee that a large initial seed of Huffington Post readers would see the JWT produced advertisements. All the advertisements were displayed by a blogging platform that made it easy for consumers to share the ads they liked through email, IM, or links from their personal sites. As with the ForwardTrack examples, the seven different Ads provided by JWT realized different  $R$ , ranging from 0.5 to 0.97. Overall, however, the campaign exhibited an  $R = 0.86$ , corresponding to a gain of more than 700%. In raw numbers, JWT’s Ads received a combined 188,000 “bonus” page views—that is, page views over and above the roughly 30,000 that JWT paid for—that came from free PR and consumer sharing. JWT, in other words, got more than seven times the reach of their ad buy without the campaign ever exhibiting  $R > 1$ .

	Ad 1	Ad 2	Ad 3	Ad 4	Ad 5	Ad 6	Ad 7	TOTAL
Paid Views (Seed)	4,073	5,731	6,973	4,585	2,567	3,966	2,280	30,175
Extra Views	140,088	13,606	7,190	8,716	7,848	5,878	5,343	188,669
Total	144,161	19,337	14,163	13,301	10,415	9,844	7,623	218,844
R	0.972	0.704	0.508	0.655	0.754	0.597	0.701	0.862
Gain	35.394	3.374	2.031	2.901	4.057	2.482	3.343	7.252

**Table 2. Reproduction rates for seven Ads placed by JWT on Huffington Post**

Finally, it is worth noting that some well-known viral marketing campaigns surreptitiously used a big seed approach. For example, Burger King’s widely admired “subservient chicken” campaign reached millions of viewers, but was also supported by a nation-wide marketing effort that yielded a very large seed. Although many people heard about the website through word-of-mouth, many others saw television ads paid for with a multi-million dollar advertising budget. Perhaps because it makes a better story, journalistic accounts of the campaign usually fail to mention the paid advertising and present the campaign as a purely viral phenomenon. Nevertheless, the Subservient Chicken clearly benefited from paid advertising that dramatically expanded the reach of the campaign. Given the unknown seed size, it is difficult to determine if the campaign ever had a reproduction rate greater than one; however, the advantage of the big seed approach is that a campaign can be successful when  $R < 1$  as well as in the extremely rare case where  $R > 1$ .



### **Simple means reliable**

Although our notion of big seed, sub-viral marketing is an extremely simple application of epidemic modeling, and lacks the mystique of truly viral marketing, it carries the overwhelming advantage of being relatively reliable, as well as straightforward to implement. All one needs is access to a sizeable mailing list or ad-buy—bread and butter for large companies who retain advertising firms—and some email or web-based tool that enables peer-to-peer sharing, in to improve one’s advertising yield by 10%, 100% or even more.

Big Seed Marketing means companies can get the benefits of viral marketing without the extreme difficulty and unpredictability required to achieve an R value greater than 1. The real value of viral marketing, therefore, especially for large media companies, is not in the occasional, unreliable, campaign that “tips” its way into public consciousness from some small seed, but rather the systematic enhancement of standard ad buys with viral tools, yielding smaller, but still often quite sizeable returns on investment. As the Internet matures and advertising adapts to a new era of ubiquitous networks, an increasing number of companies will find a competitive advantage by adopting Big Seed Marketing.

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