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FORETHOUGHT GRIST

Viral Marketing for the Real World

by *Duncan J. Watts and Jonah Peretti*

Viral marketing has generated a lot of excitement recently, 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 effortlessly to reach millions. Unfortunately, for every high-profile example of a successful viral product—FlashMobs, the Star Wars Kid, or JibJab's 2004 election spoof—there are many more attempts that fail. Reliably designing messages to exhibit viral properties is extremely difficult, it turns out, as is predicting which particular individuals will be responsible for spreading them. (See Duncan Watts's February 2007 HBR List item, "The Accidental Influentials.")

Fortunately, it is possible for companies to benefit from the insights of viral marketing while avoiding its most serious pitfalls. We propose an approach called *big-seed* marketing, which combines viral-marketing tools with old-fashioned mass media in a way that yields far more predictable results than "purely" viral approaches like word-of-mouth marketing.

The standard viral-marketing model is based on an analogy with the spread of infectious disease. It assumes that one starts with a seed of individuals who spread a message by infecting their friends, where the expected number of new infectious people generated by each existing one is called the "reproduction rate," or R . When R is greater than 1, each person who gets the message will, on average, 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 receive it—an epidemic. By contrast, viral messages with an R of less than 1 are generally considered failures. That's because purely viral campaigns, like disease outbreaks, typically start with a small number of seed cases and quickly burn themselves out unless their R exceeds the epidemic threshold, or tipping point, of 1.

There is an important flaw in the epidemic analogy, however: Companies, unlike diseases, can use standard advertising methods to create potentially enormous seeds. If the initial seed is big enough, then even if R is less than 1, the burnout process will persist for multiple generations, thereby reaching many additional people. By providing social-sharing tools that are easy to use, moreover, marketers can reliably increase the reproduction rate of their message—an important point, as even small increases in R can dramatically increase the number of additional cases.

Imagine, for example, that an advertising firm makes a standard ad buy on the Web, or directs TV viewers to a Web site, or uses an e-mail list to contact potential consumers directly. Regardless of the method used, the campaign will yield some large number, N , of conversions—people who are sufficiently interested to click on the Web ad or embedded link. Traditionally, that's all it would be expected to achieve, but imagine now that these N viewers can also share the ad easily with anyone else. In other words, what would previously have been the entire audience for the message also becomes the big seed for a viral campaign in which the newly added people can forward the message to their friends, who may forward it to their friends in turn, and so on.

Allowing this process to proceed indefinitely, and assuming a constant reproduction rate less than 1, some simple math (details of

which are available at <http://cdg.columbia.edu/cdg/papers>) reveals that the final number reached will be approximately $N \div (1-R)$. So if, for example, some campaign exhibited a reproduction rate of 0.5, meaning that each generation is half the size of the previous one, then an initial seed of 10,000 people would pass it to 5,000 new recipients, and those 5,000 would pass it to a further 2,500, and so on, eventually reaching a total of 20,000 people—twice the number that would have been reached by the traditional campaign.

In the past two years, a number of organizations have effectively implemented big-seed campaigns using open-source software called ForwardTrack, developed by Michael Frumin of the media art nonprofit Eyebeam and designed to encourage people to forward messages to their friends. None of the campaigns that used ForwardTrack succeeded in tipping—that is, consistently exhibiting a reproduction rate greater than 1—but by starting out with large mailing lists, all the campaigns reached an impressive number of additional people.

For example, a campaign called Tom's Petition—an appeal for gun control launched in 2004 by StoptheNRA and the Brady Campaign—exhibited a reproduction rate of 0.58, meaning that ForwardTrack more than doubled the size of the initial 22,582-member seed. Stimulated by the success of Tom's Petition, Procter & Gamble subsequently incorporated ForwardTrack into a viral campaign to promote Tide Coldwater as an energy-efficient alternative to regular detergents. This campaign registered a much lower reproduction rate of 0.041 but was initiated with such a large seed—over 900,000—that it still reached some 40,000 more individuals than it would have without the forwarding capability. And a campaign run by Oxygen Network, in which Oxygen agreed to donate \$1 for every participant (up to \$25,000) to Hurricane Katrina relief, exhibited the highest reproduction rate we have seen to date—0.769—reaching an additional 23,544 participants beyond the initial seed of 7,064.

Although our notion of big-seed marketing lacks the mystique of truly viral marketing, it is straightforward to implement and can reliably improve advertising yields at low cost. Equally important, because big-seed marketing harnesses the power of large numbers of ordinary people, its success does not depend on influentials or on any other special individuals; thus, managers can dispense with the probably fruitless exercise of predicting how, or through whom, contagious ideas will spread.

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