Scientific publishing is inbound marketing
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Companies like HubSpot provide tools and services for companies to market themselves and measure how well they are marketing themselves online. Some of the major tools that are used for inbound marketing are forms of online publishing including blogging, micro-blogging, and posting content to social network sites. Inbound marketing is the practice of providing content that attracts people, be it customers, potential customers, or anyone with a certain level of interest, to the source of that information be it a website, a business, a person, or a research lab or institute. In the words of Brian Halligan and Dharmesh Shah in the book *Inbound Marketing* it is defined, "Inbound marketing is about getting found online, through search engines [like Google] and on sites like Facebook and YouTube and Twitter -- sites that hundreds of millions of people use to find answers each day."

In contrast to brick and mortar or online companies who are trying to extend their customer base, gain feedback into how their users or customers are using their products or finding their services, scientific researchers publish to communicate their results, survey existing research, and oftentimes provide evidence of research that was supported by grants from private funding bodies or the federal government. It is well known to inbound marketers that providing content on the web in the form of a blog or press releases can increase the exposure of that company or brand to its market. Inbound marketing is contrasted to outbound marketing or broadcast-based media such as radio, television, internet advertising, or bill board real estate. In this traditional advertising model large companies buy airtime and broadcast to specific audiences during specific timeslots, or to specific demographics, or to specific geographic locations. Broadcast advertising can be extremely expensive and depending on the medium can often be out of reach to all but the largest multi-national corporations. With the increase in on-demand television, podcasts, and increasingly fractured and diverse online and offline markets, much criticism is placed on the relevance, conversion rates, and expense of many outbound marketing campaigns.

This article is addressed to both scientists who may not be aware of some trends in inbound marketing and to other marketers who may not be aware of the activity in scientific publishing. Both camps have something they can learn from each other for their respective goals. In some sense, scientists, writers, and scholars have known about inbound marketing all along. Their papers, books, and lectures all provide a message that attracts people who are interested in that message to read their papers, buy their books, and attend their lectures. As individuals or small groups, they have never had access to large broadcast media, or production companies to promote their messages via expensive TV spots, trade show exhibits, or billboards -- but through their publishing interested parties access their message, and find them online. Daniel Grushkin of DIYBio NYC recently asked at a ScienceHouse event if there was an equivalent to a "viral video" in the YouTube sense in scientific publishing. The traditional answer is the number of citations a paper receives, as tracked by science citation indexes. The difference here is the number of *views* vs. the number of *citations*. The producers and

publishers of YouTube videos are, of course, influenced by other videos, and YouTube shows "in response" videos even if explicit citations are not made.

For marketers, press releases and blog posts -- publications -- are made in order to get information about their products in the hands of their consumers, and for scientists and research institutes it is to get exposure for their research work, their workers, and to bring in more research funds and also to perhaps increase the rate at which research work is transferred to the private sector. The readership of scientific results outside the scientific community is extremely limited and the job of communicating between the communities often left to science journalists. In many cases these journalists neither have in-depth knowledge of the science they are writing about or of the business cases or industries who may be concerned with the new research.

Nature Networks is a scientific social network set up by Nature.com, a nature and scientific publishing company. Several prominent social networks for academics exist and are used for a variety of purposes, several of these include SciColab.com, Academia.edu, Epernicus.com -- and there are many more. Indeed, anyone can make a new science social network on Ning.com in a few mouse clicks for free. Many scientific writers write personal blogs or contribute to networks of blogs like ScienceBlogs.com. The most popular "science blogs" rarely draw more than about 4-5K unique visitors per month.

In the "broadcast media" form of advertising messages are sent to a very broad audience, essentially whoever is listening to the radio or TV channel. Advertisers buy time, and hope that their desired audience happens to be listening while their message is broadcast. Traditional media advertising and programming has been dominated by the outbound marketers who finance it: traditional outbound marketers have included Coca-Cola, Nike, political campaigners, etc. -- anyone who can afford to buy the advertising spots and fill them with expensive content.

Working scientists are under enormous pressure to publish. If they do not publish, it is as if they did not do their experiments, did not get their results, and did not do their analysis. Indeed, it is the record of the scientific endeavor, it is a record of who did the writing, conceived of the experiment, did the research, and provided the funding. By contrast, most businesses regardless of their size have little interest in providing this kind of exact information. Scientific articles published by academic researchers and labs have a particular format that reflects the scientific and research process. Last in order in a paper, but often first in importance in understanding a piece of research is the references section. Across all publishing and creative endeavors, references are made either implicitly or explicitly. The Frenchman Voltaire implicitly cites Greek writers, playwrights, and philosophers in his work, but does not cite them at the end. In film, modern directors and filmmakers are influenced by the people who have created works before them, and when asked often explicitly "cite" them.

The practice of exhaustively or enumeratively listing all influences to a certain piece of writing as practiced on a business blog or web listing of press releases does not make sense to publicists, marketing directors, and public relations professionals. It is rather the incoming links and traffic that matter. Not just is it incoming web links and web

traffic: it is incoming lead generation and conversion rates. Businesses are not *only* in the business of getting information about their products out via social media and their web publicity portal, they are trying to generate business, retain customers, and field questions and support issues regarding their products and services.

One of the metrics that is most often used to judge the popularity of a scientific article is the number of times it had been cited. An online service of Thomson Publishing tabulates and recalculates this metric every week and provides the results of new citations at the ISI Web of Knowledge by Thomson. The "science citation index" is a part of this service from Thomson. Scientists have historically not had measures of "traffic" to their articles. Perhaps a comparable metric in the pre-electronic publishing age was the number of requests for reprints that were received by an individual author or lab. Only recently have web sites distributing scientific articles listed the number of downloads or views, the Public Library of Science, or PLoS, a group in San Francisco, is perhaps most innovative in respect to providing up-to-date metrics on the number of views and PDF downloads of papers. The "after market" of paper readership, as in which papers are sent around as PDF files on email or on distribution lists is largely untrackable.

On the Web 2.0 side, the traffic metrics of unique visitors, page views, and the demographics accessing that content is provided by a variety of companies. Compete.com, a Boston company, monitors some traffic through certain internet traffic routing points and provides a ranking of unique visitors to a site per unit time. The Alexa ranking, from Alexa Internet, Inc., is based on a client downloaded to some PCs which monitors what users of those PCs are accessing. ComScore allows sites themselves to install a plug-in that tracks traffic and provides the traffic information to third parties. A simple view-counter has been used since the early days of the pre-interactive web to count the number of views a site is receiving.

The Science Citation Index from the Institute for Scientific Information (ISI) owned by Thomson and originated by Eugene Garfield and journal "impact factor" which measures an aggregate measure of the citability of articles in a particular journal, can be paralleled in the viewership numbers and essentially conversion rates of TV or radio. The "conversion rate" in scientific publishing is essentially the article or journal citability index. "High impact" journals are ones that receive in aggregate more citations per paper, have lower acceptance rates, and are generally thought to be more coveted by writers and content-providers alike. If there are 10 million viewers of a particular prime time TV spot, the station can charge a higher premium to advertsiers, and the advertsier/marketer gets a higher audience. Just as for a scientist publishing in Nature or Science has a higher impact factor than the proceedings of a small conference.

Traditional business marketers can benefit greatly by taking note of some of the conventions used in academic publishing. The better the message marketers distribute or publish, just as the higher quality academic papers receive higher readership and affect the market for grant dollars, the higher conversion rates or brand recognition the marketer can achieve. Presently, there is a kind of informal tally of the impact of an advertising campaign among companies in this business sector. It is somewhat short-lived and is based primarily on individuals' memories of past specific marketing

campaigns and themes of different advertisers and the companies they hire to produce content for them. There are few records of past TV campaigns for instance, though sites like YouTube are allowing for essentially longer-lived advertising in the age of TiVO and on-demand. In a season, some campaigns are more "memorable" than others. But, clearly, an advertiser does not "cite" the advertisers who have come before in their advertising spots. It is part of the industry knowledge. In very competitive industries, like cell phone carriers, of course certain very competitive "dialogs" take place such as recent campaigns between Verizon, T-Mobile, and AT&T.

Scientific publishing is going through many of the same challenges and transitions that other forms of media are going through. It is cheap and sometimes free to get your message out via the web. Starting a new electronic journal is a relatively inexpensive process. New media such as web video is being increasingly used to convey specific scientific protocols using video. JoVE.com – the Journal of Visual Experiments is a web 2.0 science start-up whose goal is to bring the rapid YouTube-style of broadcasting and media dissemination to laboratory protocols.

Businesses are seeing the value of inbound marketing both for its relative inexpensiveness and are pressured into adopting it in some form because everyone else is doing it. Many companies are setting up community social networks or bulletin boards of the form *community.company.com*: Communities.Intel.com and Community.Dell.com being notable examples. Innovators in inbound marketing for both science and business will no doubt see their investment pay off.