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Social Media and the Scientific Community

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I have neither given nor received unauthorized assistance while preparing this assignment and I have written the code myself.

Research shows that the acceptance and use of social media in the scientific community is dwarfed in comparison to its prevalence in the commercial business sector. This paper will explore the reasons behind that imbalance, and whether using social media makes sense for the scientific community.

The World Wide Web was created to facilitate collaboration among scientists. Though not currently widely accepted by the scientific community, social media can make that collaboration even more robust and effective. Given the explosive growth and acceptance of social media overall, I believe that it is only a matter of time before the scientific community embraces these tools.

Though initially developed as a conduit for online interaction among friends, social networking has picked up speed as it has outgrown its original boundaries and infiltrated nearly every aspect of our daily lives with new and powerful iterations of digital engagement

Acceptance of social media in the scientific community, however, has lagged far behind that of the world at large.

According to Richard Lackes of the Department of Business Information Management at Technische Universitaet Dortmund, Germany, this disconnect "is an odd finding, (since) **scientific research is essentially a communication-driven process** and most of its participants are young and part of what we might refer to as the Facebook generation (Gen-F, you might say). Members of the business world have a much more even spread of ages and differences in internet acceptance, and yet, it is business users who are much more committed to online social networking." Lackes' observation was reported by David Bradley in his post "Gen-F Scientists Ignoring Social Media" on his ScienceBase blog.

In "Scientists Shun Web 2.0," The Register's Chris Williams reports that "A panel of science web publishers said scientists had consistently shunned wikis, tagging, and social networks, and have even proven reticent to leave comments on web pages. The refusnik stance presents a puzzle in light of arguments in favour of Web 2.0 services which are more compelling for science than for trivia - the biggest web 2.0 market to date. **The science game gave the world peer review after all**, and scientists have often lauded and contributed to Wikipedia, despite its well-documented eccentricities and flaws"

The lack of presence isn't limited to the scientists and researchers themselves. The companies, institutions, and organizations they work for have also been slow to incorporate social media in their models. Cliff Mintz, writing for LifeScience Leader, says "Despite its popularity and use among many consumer-oriented Fortune 500 companies, most pharmaceutical, biotechnology, and devices/diagnostic companies have refrained from using social media to engage customers and stakeholders. Instead, most have chosen to stick with a decidedly Web 1.0 model, which tends to keep customer interactions to a bare minimum. Indeed, only a handful of life sciences companies have decided to take the social media plunge, claims Jonathan Richman, director of

business development at Bridge Worldwide Inc. and author of the popular "Dose of Digital" blog, which tracks social media usage by life sciences and healthcare companies."

Though its image is changing as it becomes more mainstream, social media is still largely viewed by the scientific community as a trivial, time-wasting activity that adds no intrinsic value in the real world, as pointed out by Brad Kruger, founder of Labspaces.net: "Scientists really don't like discussing their thoughts and ideas in the public domain (both for scooping and patent issues). There may be an assumed lack of security on internet-based social networks and a time-wasting aspect in that there's nothing gained from time spent online when conferences and meetings provide all that many scientists feel they need."

I believe that personality may be another factor that contributes to the sparse number of scientists and researchers using social media. Since its inception, one of the big draws of social media has been the ability to display the (preferably large) quantity of friends or followers a user has amassed. Those who choose a career path that requires them to spend the majority of their time hunched over a lab bench, however, are not exactly prime candidates for large numbers of gregarious friends. This unspoken but acutely felt factor may further contribute to the reluctance of the scientific community -- in which **egos are bolstered more by quality than quantity --** to participate.

Rich Brooks, Fast Company Technology Expert and president of flyte new media, observes that "There seems to be some sort of social media arms race going on, where **the perception is that the person with the most followers/friends/connections wins**. However, measuring your success by the number of connections you have is like measuring a business based on how many clients they have. That's no way to value a company."

Interestingly, a new study released by the University of Pennsylvania's Annenberg School of Communication and the Pew Internet Project found that **Internet and mobile phone users have larger and more diverse social circles than their technology-resistant counterparts**. Based on the responses from more than 2,500 U.S. adults, the researchers found a positive correlation between technology usage and an expanded "discussion network," which they defined as the network of people with whom an individual feels comfortable talking over important issues. According to Keith Hampton, a professor at the Annenberg school and the report's lead author, "It turns out that **those who use the Internet and mobile phones have notable social advantages**. People use the technology to stay in touch and share information in ways that keep them socially active and connected to their communities."

Considering the study's findings, researchers and scientists may be caught up in a vicious cycle of not having large social circles, which results in a limited amount of online social interaction, which in turn limits the size of their social circles.

Fortunately, as social media evolves the emphasis seems to be **trending away from quantity and toward quality**. In David Amano's Business Week post, "Six Social Media Trends for 2010," he says "**With groups, lists and niche networks becoming more popular, networks could begin to feel more 'exclusive**.' Not everyone can fit on someone's newly created Twitter list and as networks begin to fill with noise, it's likely that user behavior such as 'hiding' the

hyperactive updaters that appear in your Facebook news feed may become more common. Perhaps it's not actually less social, but it might seem that way as we all come to terms with getting value out of our networks—while filtering out the clutter."

This change in the social media mindset may make members of the scientific community more amenable to joining, and could trigger more widespread acceptance. As the number of participants increases, the value of the social networks increases, which in turn makes the medium more attractive. One example of this snowball effect was highlighted in Cell's article "Should You Be Tweeting?#". Chris Gunter took up Twitter soon after she joined the HudsonAlpha Institute for Biotechnology in Huntsville, Alabama as director of research affairs. "One thing that I have to do as part of my job is to communicate our science. I started to explore Twitter as a tool to do this, and I have seen a steady growth in followers." She now has over 1200 followers on her Twitter account, "girlscientist.".

Gunter may be the exception, however. In his "Why Scientists won't use Twitter" post on The Daily Nash-on, Nachiket Vartak argues that "The data and models a scientist generates and the insight they provide is the usually the culmination of a long arduous process. In most cases, it represents years of sacrifices, blood and sweat (of the researcher, metaphorically and his lab rats, literally). As such, **the culture of Twitter, which is to openly pass out information is entirely antithetical to the culture of science**. Scientists will protect their data from all eyes until it can be represented to the public through a legitimate medium. Only a peer-reviewed journal or a patent is a legitimate medium, by the way, Twitter is not. It is a vicious circle. Twitter is not a legitimate source because of Point 1-3…and Points 1-3 would be rectified if Twitter was considered a legitimate source."

William Gunn, scientist, blogger, and advocate for social media use in the scientific community, posted *Why are we so impatient about new web technology?* on his Synthesis blog in early 2008. His observations about the slow uptake of social media by scientists and researchers make practical points about the natural progression of the acceptance of new technology. "Most reporting, and in fact, most decision-making, in this fast-paced world is of the rapid, less accurate type. My nature is to tend towards the slow, careful analysis, so now that we've gotten the jackrabbit judgments of how well Web 2.0 works for scientists, let me add my turtle-like analysis of the situation. **No one should expect established scientists to give up their established processes for the new way of doing things**. Architects didn't throw out their drafting tables en masse when CAD programs came on the scene, and lawyers still keep legal libraries to this day, at great expense, when the legal databases are more up-to-date and easier to search. Perhaps I'm echoing a bit of Thomas Kuhn here, but new tools are used by the people who had them available as they were learning, and greater adoption comes from a greater number of these people getting into science, rather than a greater number of people already in science becoming those people."

Despite the naysayers, not everyone is convinced that social media is a dead end for reaching the scientific community, as noted in this excerpt from a recent ArticlesBase post: "Social networks hold tremendous promise and opportunity for biotech companies to enhance their consumer marketing," said Mouli Cohen, Ecast and Voltage Capital founder. Most pundits expect biotech and pharma companies to continue to proceed with caution. Cohen, however, thinks they should

forge ahead. "There is too much upside and opportunity that social media offers. **The challenge is to utilize social media in the way it's meant to be used – as an engagement tool that facilitates two-way communication and adds real value** for consumers. The companies that harness the power of social media will gain a competitive advantage and enhance their reputations in the process."

This kind of thinking supports the premise is that social media can be an effective tool for reaching the scientific community, though it may take some time to see any significant return. The overall number of social media participants is growing, and will continue to rise based on Forrester Research's latest survey: "Social technologies continue to grow substantially in 2009. Now more than four in five US online adults use social media at least once a month, and half participate in social networks like Facebook. **While young people continue to march toward almost universal adoption of social applications, the most rapid growth occurred among consumers 35 and older**. This means the time to build social marketing applications is now. Interactive marketers should influence social network chatter, master social communication, and develop social assets — even if their customers are older."

Kent Anderson of The Scholarly Kitchen (the official blog of the Society for Scholarly Publishing) recently shared the encouraging news that scientists are in fact using social media, especially Twitter, to connect with colleagues. "In an analysis published in the October 30th issue of Cell, Laura Bonetta quotes **a number of scientists who are using Twitter to broadcast awareness of papers they find interesting while learning about papers others find interesting**. Most of those quoted have 1,000+ followers. In addition, scientists Bonetta found are Twittering from meetings to help peers follow along…it seems there's plenty of evidence that scientists are using social networks (from general ones like Facebook and LinkedIn to more specialized ones like Academia.edu and others), as well as social media tools, from blogs to Twitter to RSS."

The fact that there are numerous networking sites for scientists like Mendeley, labmeeting, NatureNetwork, Laboratree, Scientist Solutions, and a host of others is further evidence that the scientific community may actually be more social than they are given credit for. In a move that affirms that social media does indeed have a place in the scientific community, the National Institutes of Health announced that is it creating what it calls "Facebook for Scientists." **Though the scientific community may approach social media differently than corporate populations, they *are* using it**.

Richard Price, CEO of Academia.edu, agrees. "Sites like Academia.edu are growing fast; we have over 61,000 profiles at the moment and are seeing exponential growth. I think the critical mass point for an academic networking site is around 500,000 to 1 million profiles; that is when growth will really accelerate."

LinkedIn is the social networking site of choice in the corporate world, surpassing 50 million users in October of this year. In announcing its milestone, the company pointed out that it took nearly sixteen months for LinkedIn to reach its first million users. The last million took only 12 days. In her Mashable post on the subject, Christina Warren comments that "As more and more social networks start to expand their focus and go after more types of users, we like that

LinkedIn has continued to reinforce its mission of connecting professionals to each other. **Sometimes having a solid target and niche can be more effective and lead to greater consistent growth than trying to be all things to all people**."

LinkedIn's story bodes well for the science-focused network sites mentioned above, and particularly for ResearchGATE, which can be best described as a LinkedIn for scientists. The site allows members to post their profiles, papers, research projects, interests, and skills to promote themselves and collaborate with others. According to TechCrunch, "What makes ResearchGATE's site useful is not only its ability to share documents but to be able to connect with scientists all over the world on issues of interest. By suggesting users with similar interests, **the site does a lot of the networking work for users**." The site's semantic search engine drives the suggestion feature, and is what sets it apart from other scientist-centered social networks. By suggesting potential connections, the site reduces the amount of time that members must invest to generate value from participation.

ResearchGate can assist scientists in finding collaborators, staying current on new advances, and sharing their own research. Though it seems an unlikely medium, some scientists are using Twitter to accomplish the same things. The July/August issue of BioScience included "Twitter: What's All the Chirping About?" The article shared the story of evolutionary biologist Jonathan Eisen, of the University of California, Davis. Eisen first joined Twitter so he could follow Lance Armstrong in the Tour of California. He later began using Twitter to communicate and share information with other scientists. "To do science, you have to know what's going on in science," Eisen says. "I found **Twitter...most useful for becoming informed of what other people are doing in science**." By sharing comments, links, information, and notes about new scientific developments with trusted sources, Eisen says, he is better able to keep up with the vast amount of information in his fields of interest. Twitter and other social networks such as FriendFeed, he says, enable real-time highlighting and ranking and tracking of what's going on in the world of science. Twitter is also useful for networking and finding collaborators."

Additional evidence of the use of Twitter is David Bradley's list of 32 scientists with 2,000+ Twitter followers, and the site's science Twibe, which is "a place for scientwists to meet and engage."

The social media tools that will succeed for scientists will be those that are either specifically built to fit the culture of the scientific community or are easily adapted to the nuances of that culture. In his splendid post "Web 2.0 for Biologists," David Crotty examines the reasons scientists (biologists in particular) don't use social media. Aside from the reasons already explored in this paper (lack of critical mass, perception that social media is a time-waster, too much emphasis on quantity vs. quality), Crotty notes that **blending with the existing culture is critical for adoption**. "Myspace is targeted at a particular culture, and while it works well for that culture, the idea of shoehorning other groups into its functionality is flawed. Biologists interact in very different ways than teenagers and their peers, or rock bands and their fans. Biologists don't find collaborators by chatting online with strangers."

The early-adopters of social media in and for the scientific community are finding ways to use these tools that fit their existing culture. As these "evangelists" show their peers the value of

social networking, the number of adopters will grow. The more users there are, the more usage adaptations will be developed and be spread. I believe that **the scientific community and the social tools they use will evolve and change to become more useful to each other**.

An example of this evolution is the newly launched Facebook app "What's Your Favorite Gene?" According to The Medical News, the application "provides a platform that can enable scientists and researchers to network with each other and facilitate discussion based on their favorite genes, identifiable via gene functionality and biological pathways. The application also allows researchers to post and share gene information using gene details and associated pathways and interactors."

"With over half a million users worldwide interested in science, including around 200,000 that are researchers or that are interested in Biology, Facebook provides an outstanding platform to connect scientists," said Dr. David Smoller, President of Sigma-Aldrich's Research Biotech business unit. "The 'Your Favorite Gene' portal provides the scientific basis for that connection and we hope (it) fosters a culture of information exchange and collaboration within the life science community. We plan to continue expanding the online dialogue of researchers and will be developing additional ways to connect scientists in the coming months." **To successfully engage scientists via social media, this kind of audience understanding and creativity is essential**.

The founders of JoVE.com (The Journal of Visualized Experiments) recognized a similar opportunity to create value for researchers by providing a venue for experiments to be presented and shared online. JoVE enables scientists to view videos of actual experiments and results performed by the researchers doing the work instead of having to labor through the details in a printed article. "The complexity and breadth of life science research has increased exponentially in recent years. Research progress and the translation of findings from the bench to clinical therapies relies on the rapid transfer of knowledge both within the research community and the general public. **Written word and static picture-based traditional print journals are no longer sufficient to accurately transmit the intricacies of modern research**."

Recognizing the importance of attributed research credit to the scientific community, JoVE articles are also listed in Pubmed and MEDLINE so they can still be cited by other authors. To address credibility, all submissions go through peer review and editorial review. In what could be viewed as an adaptation of the YouTube model, JoVE has found a creative, value-added way to help scientists publish their work professionally and quickly, and to provide worthwhile content to its visitors.

My research has revealed a wide range of opinions on the future of social media in the scientific community. I believe that those who are downplaying its potential are being short-sighted and not giving the community enough credit for its ability to creatively integrate new technologies. Science is all about making new discoveries, and this group will surely discover new ways to utilize social media in their work. Already there have been promising developments in the format and scope of social media for scientists and researchers, but more user participation and application credibility is needed for the medium to be fully accepted by the community. To support those advances, creators of social media platforms must cater to the focused, protective

culture of the scientific community, and the culture of science and research must shift toward more open collaboration and broader social interaction.

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