

Review

Use of Web 2.0 tools and technologies for science communication in biomedical sciences: A special reference to blogs

Rajendra Babu H^{1*} and Gopalaswamy M²

¹Capco Technology Pvt. Ltd. Symphony Innovation and Excellence Centre, No. 13/1, Kadubeesanahalli Village, Outer Ring Road, Bangalore, India - 560087.

²Dy. Librarian, Library, Karnataka State Open University, Manasagangotri, Mysore, Karnataka, India-570006.

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The term Web 2.0 (2004–present) is commonly associated with web applications that facilitate interactive information sharing, interoperability, user-centred design and collaboration on the World Wide Web. The advent of blogs and the rapid availability of site building software have made it easy for a single person to reach millions of people in a short period of time. While this was a dream 20 years ago, it has become a reality today. Overall, the use of Web 2.0 techniques in the enterprise promises to have profound and far reaching effect on how organizations work both internally and externally, creating completely new and powerful ways of reaching, selling and supporting customers as communities.

Key words: Web 2.0, web-based communities, hosted services, web applications, social networking, video-sharing, wikis, blogs, knowledge sharing, virtual communities, video bloggers, vlogs, vloggers, mashups, folksonomies.

INTRODUCTION

The term Web 2.0 (2004 till Present) is commonly associated with web applications that facilitate interactive information sharing, interoperability, user-centred design and collaboration on the World Wide Web.

The old models of how people publish and consume information on the web have been radically transformed in recent times. Instead of simply viewing information on static web pages, users now publish their own content through blogs and wikis, and on photo- and video-sharing sites. People are collaborating, discussing and forming online communities, and combining data, content, and services from multiple sources to create personalized experiences and applications. Commonly and collectively called Web 2.0, these new content-sharing sites, discussion and collaboration areas, and application design patterns or "mashups" are transforming the consumer web. They also represent a significant opportunity for organizations to build new social and web-based

collaboration, productivity, and business systems, and to improve cost and revenue returns. A trend in web design and development perceived second generation of web-based communities and hosted services (such as social-networking). The concept of Web 2.0 began with a conference brainstorming session between O'Reilly and media live international. Dale Dougherty, web pioneer and O'Reilly VP, noted that far from having "crashed", the web was more important than ever, with exciting new applications and sites popping up with surprising regularity. What's more, the companies that had survived the collapse seemed to have some things in common. Could it be that the dot-com collapse marked some kind of turning point for the web, such that a call to action such as Web 2.0 might make sense? We agreed that it did and so Web 2.0 conference was born. A year and half after the conference, the term Web 2.0 has clearly taken hold, with more than 9.5 million citations in Google. But there is still a huge amount of disagreement about just what Web 2.0 means, with some people decrying it as a meaningless marketing buzzword, and others accepting it as the new conventional wisdom (O'Reilly, 2007).

*Corresponding author. E-mail: rhababu2003@yahoo.co.in.

REVIEW OF LITERATURE

The study conducted by Chai and Kim (2010) investigates the relationship between trust and bloggers' knowledge sharing practices. As a Web 2.0 technology, blogs are gaining attention as useful knowledge sharing platforms for knowledge management in a collaborative work environment. Based on an analysis of results from the 485 survey respondents, the research found that there is the positive relationship between bloggers' trust and their knowledge sharing practices.

Kjellberg (2010) says "I am a blogging researcher: Motivations for blogging in a scholarly context". In this article, a group of researchers are asked to describe the functions that their blogs serve for them as researchers. The results show that their blogging is motivated by the possibility to share knowledge, that the blog aids creativity, and that it provides a feeling of being connected in their work as researchers. In particular, the blog serves as a creative catalyst in the work of the researchers, where writing forms a large part, which is not as prominent as a motivation in other professional blogs.

Derntl (2010) reveals that blogs are an easy-to-use, free alternative to classic means of computer-mediated communication. Moreover they are authentically aligned with web activity patterns of today's students. This paper takes a step toward an improved understanding of employing blogs in education by presenting a follow-up case study on using blogs as reflective journals in an undergraduate computer-science lab course. This study includes lessons learned and adaptations following from the first-time application, the underlying pedagogical strategy, and a detailed analysis and discussion of blogging activity data obtained from RSS feeds and LMS logs.

Warmbrodt et al. (2010) describes Understanding the Video Bloggers' Community (or vlogs) are a new form of blogs where each post is a video. The study explores a community of video bloggers (or vloggers) by studying the community's structure as well as the motivations and interactions of vloggers in the community. The rich communication provided in video blogs allows for a more personal and intimate interaction, making vlogs a potentially powerful tool for business applications.

Ordonez (2010) describes how they have created OurBlook.com (<http://www.ourblook.com>), an online forum created for the exchange of research, information, and dialogue on today's national and global issues. The goal of the site is to gather opinions from today's leaders in the hopes of collaboratively finding tomorrow's solutions. The 'blook' format aims to bridge the gap between a blog and book, combining the flexibility and accessibility of the web with the strengths of traditional book publishing protocols focused on documentation and shelf life. The site also offers various Web 2.0 tools to the public through the use of its community center.

Bonnie et al. (2004) describes Bloggers are driven to document their lives, provide commentary and opinions, express deeply felt emotions, articulate ideas through writing, and form and maintain community forums. Wolfgang (2007) mentions that Web 2.0 technologies, now allows scientists in their respective function as readers may play an active role in science communication as well, since they can tag documents with terms taken from their professional or personal environment. Matthew (2010) points that Science blogs has also afforded him the opportunity to reach scientists, scholars, students, and professionals working in areas related to science communication, education, and policy. Many of these blog interactions have translated into face-to-face connections, collaborations, and friendships. Minol et al. (2007) opinions that, the use of the Internet for the exchange of scientific data is characterised by exclusivity during its pioneer era, today, by a broad social spectrum of users in the exchange of information, for dialogue and in the accumulation of knowledge, displays an almost unbounded inclusion. Lucky (2000) examines the central sociological impacts that communications technologies have had on the way science is done as well as the critical influences science has had in the evolution of communications technology. He traces the evolution of today's infrastructure for research and collaboration in science via the Internet and the World Wide Web back to the invention of the telegraph, which first freed the flow of information from its reliance on the physical means of transportation and allowed communication to occur in real time. According to Lucky (2000). The remaining technical hurdles in providing unlimited bandwidth are relatively simple to overcome compared with the socio-technical engineering required to improve the three dimensions of communications--human to information, human to human, and human to computer.

DEFINITION OF WEB 2.0

- (i) The second generation of World Wide Web, especially the movement away from static webpage's to dynamic and shareable content and social networking.
- (ii) The use of World Wide Web technology and web design that aims to facilitate creativity, information sharing, and most notably collaboration.

Web 1.0 to 2.0

Web 1.0 is marked with the emergence of internet, which is undergoing a major change - from an original environment where individuals posted static information that was hard to navigate to a new environment where people are dynamically posting information and collaborating (Nikam and Rajendra, 2009). But, new

search and aggregation tools are making it easier to find and contribute to the information that an individual is interested in. This shift has been described as the switch from Web 1.0 to 2.0, which was propounded by O'Reilly. The landscape of Web 2.0 for example encompasses a whole lot of tools, which are shown in Britannica Online – Wikipedia, directories (taxonomy) – tagging ("folksonomy") and Mp3.com – Napster (Anderson, 2007). The study also tried to put across the evolution of Web 2.0 from first generation web 1.0 as under:

- (a) DoubleClick --> Google AdSense
- (b) Ofoto --> Flickr
- (c) Akamai --> BitTorrent
- (d) Mp3.com --> Napster
- (e) Britannica Online --> Wikipedia
- (f) Personal websites --> blogging
- (g) Evite --> upcoming.org and EVDB
- (h) Domain name speculation --> search engine
- (i) Optimization page views --> cost per click
- (j) Screen scraping --> web services
- (k) Publishing --> participation
- (l) Content management systems --> wikis
- (m) Directories (taxonomy) --> tagging ("folksonomy")
- (n) Stickiness --> syndication

Examples of Web 2.0

(a) Web-based communities: A virtual community, e-community or online community is a group of people that primarily interact via communication media such as newsletters.

(b) Hosted services: A business model which provides a combination of traditional information technology (IT) functions such as infrastructure, applications (software as a service), security, monitoring, storage, web development, website hosting and email, over the Internet.

(c) Web applications: Similar to hosted services, it is an application that is accessed via a web browser over a network such as the Internet or an intranet by the

customers.

(d) Social-networking sites: Listserve, linked-in, face book, twitter, MySpace etc.

(e) Video-sharing sites: Flickr, YouTube, Google Video, My Video etc.

(f) Wikis: Wikipedia, WikiWikiWeb, Memory Alpha, Wiki travel, World66, Susning.nu (a Swedish-language knowledge base) etc.

(g) Blogs: Political blogs, personal blogs, business blogs, topical blogs, health blogs, literary blogs, travel blogs, research blogs, educational blogs etc.

(h) Mashups: Data mashups, consumer mashups, business mashups etc.

(i) Folksonomies: Social tagging, collaborative tagging, social classification, social indexing etc.

WEBLOGS AND BLOGS

Definition

- (a) A website in the form of an ongoing journal; a blog.
- (b) Web logging: The design and editing of a weblog; blogging.
- (c) A web-based publication consisting primarily of periodic articles, often listed in reversed periodical order.

EVOLUTION OF SCHOLARLY COMMUNICATION IN POST GUTENBERG ERA

Scientific publishing dates back to 1665 when Henry Oldenburg started philosophical transactions of the royal society of London and Denis de Sallo, in France, published the first volume of the first print journal called Journal des Scavens on January 5, 1665. Because of its convergence and periodicity (MacDonell, 1999), this journal was known as a scholarly serial. To maintain quality and higher standards, the system of 'peer review' was introduced, which indeed helped in building the body of scientific literature, scientific reputation, increases the status of the university and institute's research. This process of peer reviewing went on for nearly 300 years. This also is the main reason why libraries subscribed to core periodicals in several disciplines. This system of peer reviewing although valuable was not free from flaws such as time lag in publishing new ideas and delay in sharing knowledge. Scholarly communication is a multi-faceted subject area, which is undergoing a profound

transformation. The study have tried to correlate public discussion of scholarly communication, as most of the attention is focused on journals, especially on the "serial crisis," in which libraries cannot afford to pay for the rapidly increasing subscription rates (according to an estimation it is more than the rate of inflation), or say with shrinking library budgets in the ever growing specializations of the nature of the disciplines which makes the librarians or library administrators all the more difficult to cater to the ever growing demands for the scholarly literature published in the form of journals. Electronic publishing, using the internet, is often seen as a possible way to relieve the pressure on cost. This view is too limited, though, as it concentrates on a small portion of scholarly communication, and it does not provide a full picture of the revolution that is taking place (Boyd, 2007).

CONCEPTS IN WEB 2.0

The advent of blogs and the rapid availability of site building software have made it easy for a single person to reach millions of people in a short period of time. While this was a dream 20 years ago, it has become a reality today. This has led to fundamental changes:

- (a) Web 2.0 websites allow users to do more than just retrieve information.
- (b) The ability of users to use the service however they want.
- (c) They can build on the interactive facilities of Web 1.0 to provide "network as platform".
- (d) Users can own the data on a Web 2.0 site and exercise control over it.
- (e) These sites may have an "architecture of participation" that encourages users to add value to the application as they use it.
- (f) Really simple syndication (RSS), extensive makeup language (XML) and blogs exist in here.

Advantages

- (a) Sharing
- (b) Priority
- (c) Recognition - people following you
- (d) Speed in communication
- (e) More authentic - author/source is known
- (f) The population as a whole would become more informed

Disadvantages

- (a) Too many people push the benefits of Web 2.0 without taking the time to educate people about the problems.
- (b) One of the key problems with Web 2.0 is dependent on the internet.
- (c) If the internet connection goes down, users will not be able to access information.
- (d) Since many web services would be offered for free, they would not be secure, and they get exposed easily be targeted by hackers.

Screen shots of the blogs using Web 2.0 technology for science communication

Today with the emergence of open access and Web 2.0 tools, the communication of science is instant and quick. The best example is 3QUARKS Daily also called as 3QD (<http://www.3quarksdaily.com>). Thus a modern tool like blogging is as good as short communications (Figure 1). This website presents interesting items from around the web on a daily basis, in the areas of science, design, literature, current affairs, art, and anything else one can deem inherently fascinating. 3QD provides you with a one-stop intellectual surfing experience by culling good stuff from all over and putting it in one place. In other words, it is what has come to be known as a "filter blog"¹⁰. There are more than 50 regular contributing authors/ scientists/ social scientists that create/ update information from around the world. This website is been created and edited by S. Abbas Raza. Though 3QD is a filter blog on all other days, on Mondays it will have only original writing by 3QD's editors and guest columnists.

ScienceBlogs was created by Seed Media Group. They have selected over eighty bloggers based on their originality, insight, talent, and dedication and how they think they would contribute to the discussion at ScienceBlogs. Its role, as we see it, is to create and continue to improve this forum for discussion, and to ensure that the rich dialogue that takes place at ScienceBlogs resonates outside the blogosphere. ScienceBlogs is very much an experiment in science communication, and being first also means being first to encounter unforeseen obstacles (Figures 2 to 4).

CONCLUSION

In summary, Web 2.0 is a paradigm shift away from directed interactions towards user defined interactions. It is the birth of web services vs. web destinations. The Web 2.0 areas of rich content and community are being used successfully by everyone today, both internally for knowledge capture and reuse and externally to create

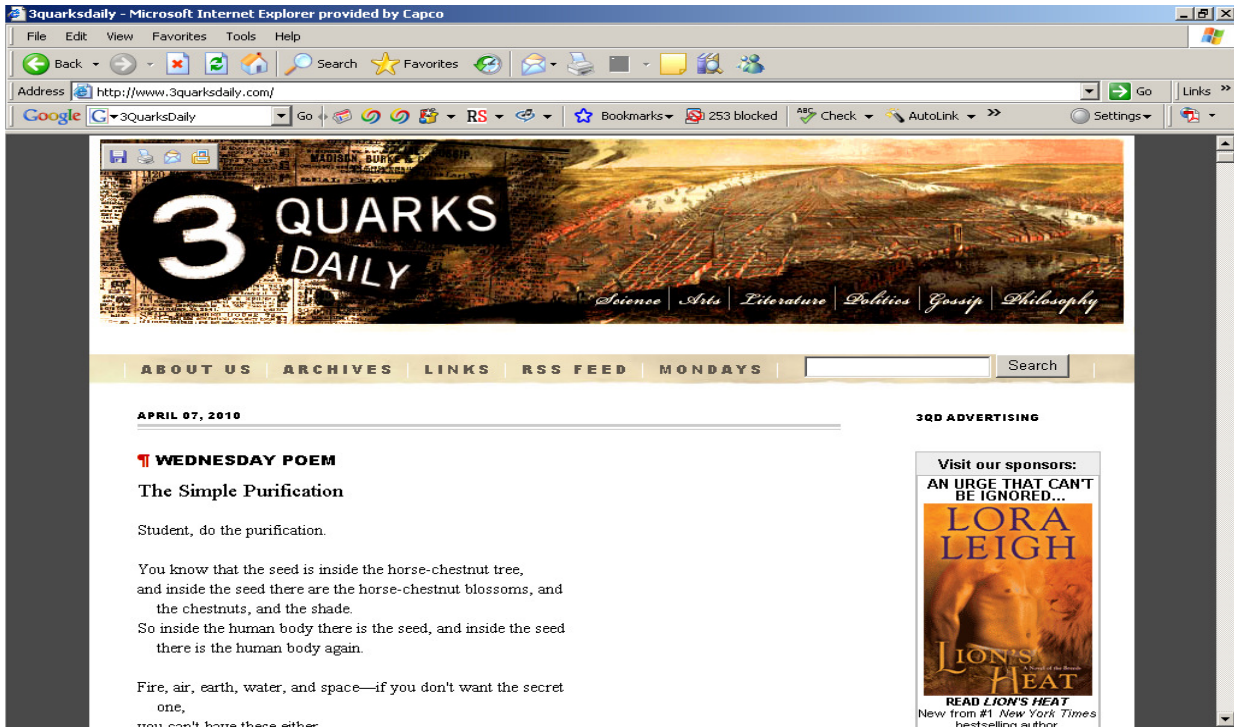


Figure 1. QuarksDaily (www.3quarksdaily.com).

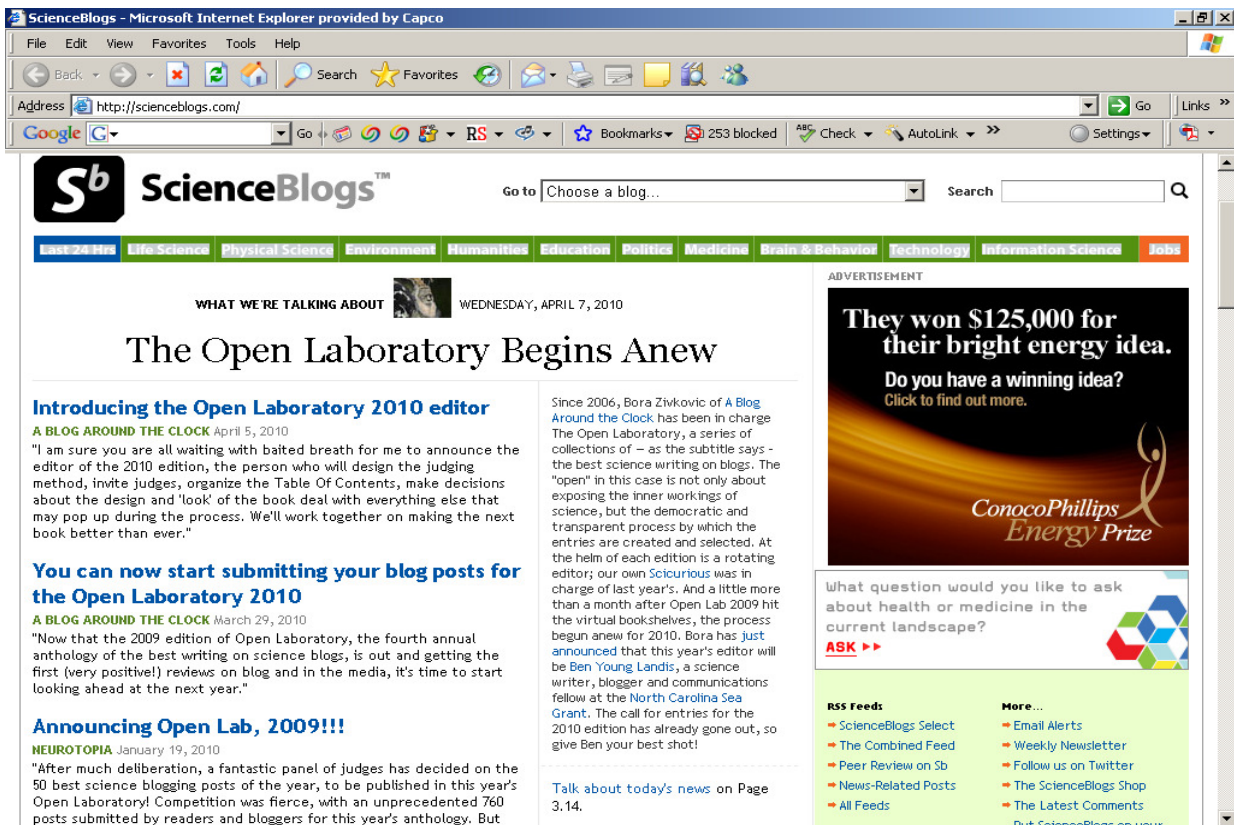


Figure 2. Science Blogs: Life Sciences.
(http://scienceblogs.com/channel/life-science/?utm_source=globalChannel&utm_medium=link).

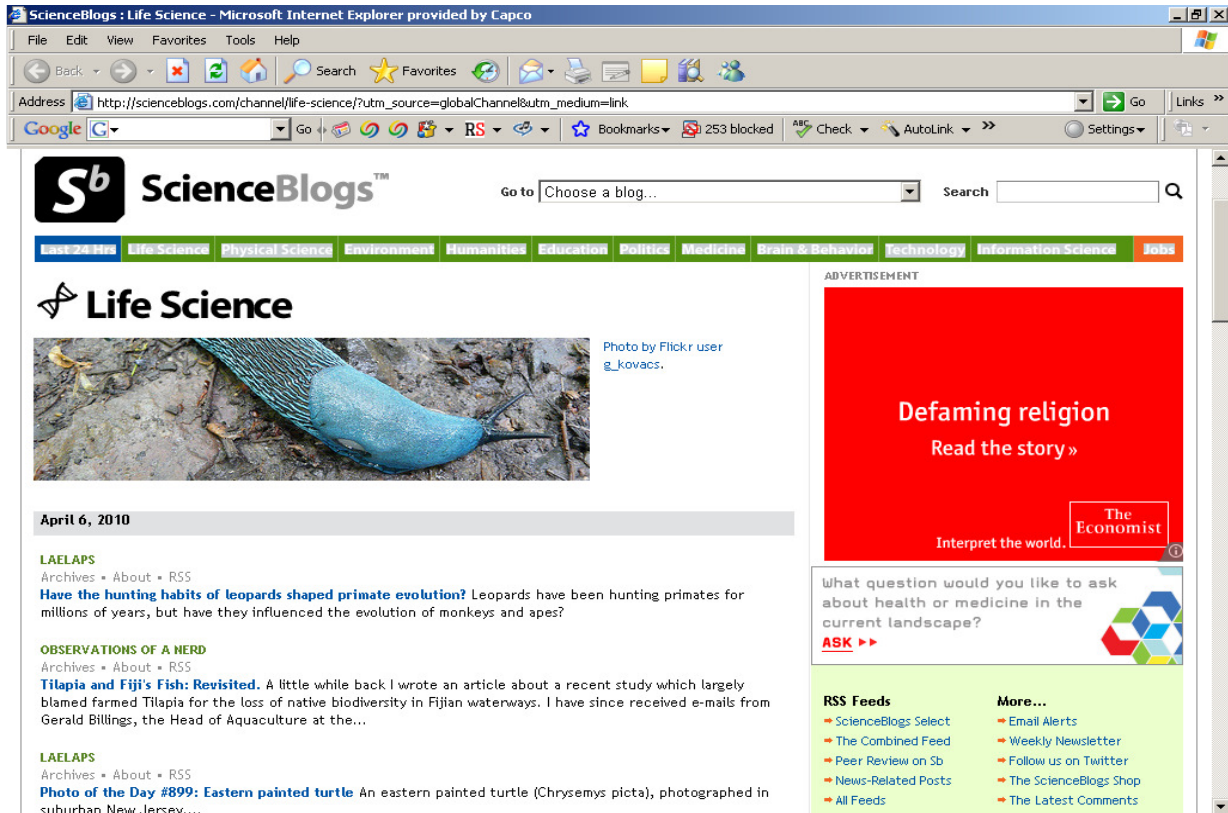


Figure 3. Science Blogs (<http://scienceblogs.com/>).

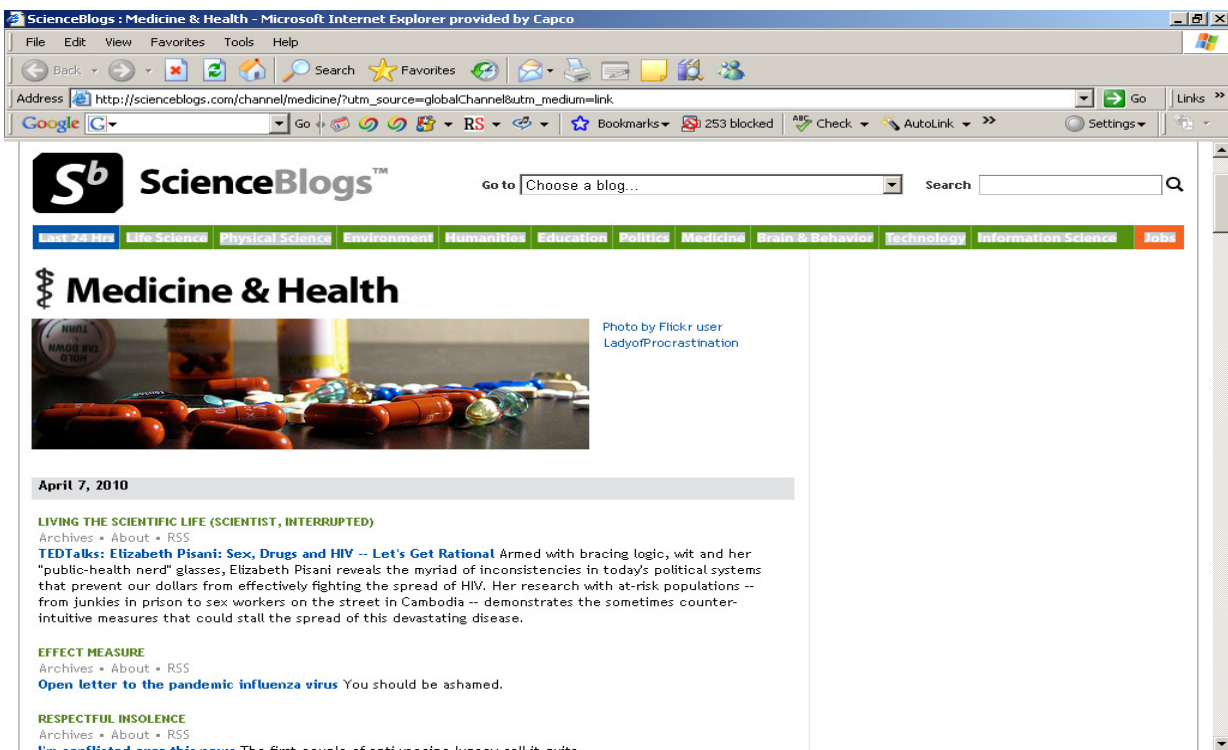


Figure 4. Science Blogs: Medicine and Health. (http://scienceblogs.com/channel/medicine/?utm_source=globalChannel&utm_medium=link).

communities of customers (Paramu, 2006). While most of the interest today is in the knowledge capture and reuse, there are still significant cultural and social issues to the successful implementation of these systems which are not solved by Web 2.0 techniques. The less well-explored area of the use of customer communities has much greater promise to the organization, yet comes with its own concomitant risks around (intellectual property) IP and vandalism which have to be addressed. Overall, the use of Web 2.0 techniques in the enterprise promises to have profound and far reaching effect on how organizations work both internally and externally, creating completely new and powerful ways of reaching, selling and supporting customers as communities.

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