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Experimentation and Quantitative Feedback Applied to the Growth of *Stemosphere* - a Student Managed Blog and Social Media Platform.

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During 4 years of study as an undergraduate biologist at the University of Iowa I became aware of the need for scientists to become digitally proficient communicators. As part of a senior project intended to develop outreach and communication skills, I built a blog, which was promoted over a social media network created for this purpose. *Stemosphere's* digital platform features student science writing. After my graduation, current undergraduates now continue to manage the site at the University.

The website may be accessed at: www.stem-o-sphere.org

Working on *Stemosphere* taught me that connecting with an audience is much more difficult than simply creating a digital platform. The adage "if you build it they will come" is simply not true in this case. Attracting and retaining an audience is a constant struggle - a task with its own techniques and best practices.

This case study will briefly introduce the components used to build the *Stemosphere* web platform before going into more depth on the audience-building strategies that seemed to work. Chief among these promotional strategies was an iterative process of experimentation. I evaluated changes to the site and to the strategies for building an audience on the basis of its corresponding influence on user-engagement data. I believe such an approach will be valuable for science communicators who know how to publish their writings but have trouble getting people to read them.

Platform Building

The following products and services were used to build *Stemosphere* and its social media platform. Each resource provides comprehensive instructions on its use.

Domain Registration: Namecheap (<https://www.namecheap.com/>)

Server: Bluehost (<https://www.bluehost.com/>)

Namecheap also provides hosting.

Blog: Wordpress auto installed to server.

Design: X Theme by Themeco (<https://theme.co/x/>)

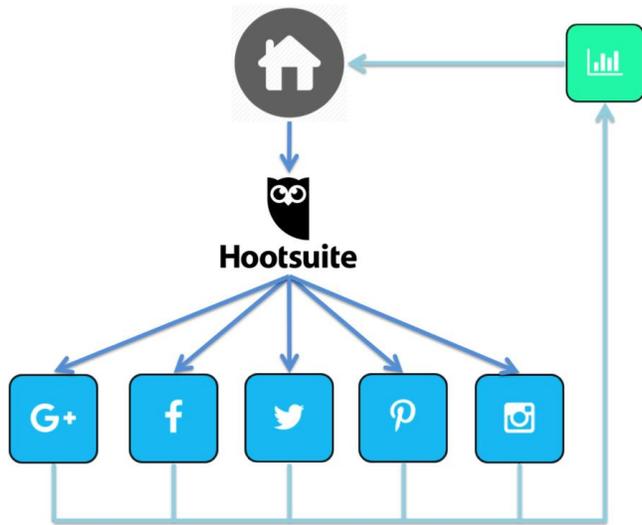
Color: Paletton (<http://paletton.com/>)

Social Media: Facebook, Twitter, Hootsuite

The video companion to this article exhibits *Stemosphere* and provides some indication of what may be accomplished with these tools. Because the site changes and grows over time, I hope you will also visit the site. Every day there are new and improved tools for publishing online. In starting a site of your own, you may find tools similar to those listed here that improve upon those available to me while I created *Stemosphere*. I recommend researching current options.

Fitting the Pieces Together

I began by identifying 3 key functions of the communication platform: content, promotion, and evaluation. Content is obvious. It's the reason *Stemosphere* was created in the first place. My hope was to combat pseudoscience and build interest in research through engaging written content. Promotion refers to any strategy used to get content in front of an audience. Social media fulfilled this need. I evaluated the effectiveness of promotional efforts and content with user engagement statistics collected in Google Analytics.



The 3 key functions form a sort of feedback loop as indicated by the diagram to the left. Content is posted on the blog (house) initially. Hyperlinks to this content are then entered into a post scheduler (Hootsuite), which distributes them across social media at regular intervals. Google Analytics (bar graph) is used to collect user statistics: total number of views, visit duration, number of pages viewed per visit, total subscribers, etc. These statistics are compiled on a cyclical basis (i.e. every 3 weeks), and I used them to determine the overall success of the preceding time period. Evaluation can be done on multiple scales. Engagements for individual pages can be used to compare the relative interest in different topics, and statistics for the entire blog can be compared between cycles.

Experimentation and Quantitative Feedback

This cyclical evaluation model reminded me of experiments I'd performed in the lab. Blog growth seemed almost organic, and understanding it as an evolving phenomenon helped me to approach efforts to accelerate growth with an experimental mindset.

Perhaps the best example of taking an experimental approach to blog growth was during the testing of multiple new blog post designs. I wanted the format of blog posts to be fairly consistent. Each contained similar visual components in different arrangements. I filled these layouts with qualitatively similar science writing stories and posted to the blog. After a period of about 3 weeks, I compared the user engagement (collected in Google Analytics) for each post. I completed several cycles of this experiment to ensure the format, rather than the content, was having an effect on user engagement. In this way, I optimized the formatting of posts. The applicability of this approach other aspects of platform creation is evident.

Once all of the pieces of the communication platform are up and running this optimization scheme should be persistent. As technology and trends in journalism change, a blog that doesn't adapt to its online environment will steadily decline in popularity and perish. Fortunately, there is no shortage of creativity in the scientific disciplines, and this is exactly what communication platforms need in order to survive. Constant ideas that are rapidly prototyped, and either selected for amplification or cessation will gradually improve every aspect of content delivery while bringing the platform toward the cutting edge in communications.