
Bringing Web 2.0 to Government Research: A Case Study

Francesca A. Barrientos

RIACS
NASA Ames Research Center
Moffett Field CA 94035
fbarr@acm.org

Elizabeth A. Foughty

Mission Critical Technologies, Inc.
NASA Ames Research Center
Moffett Field CA 94035
Elizabeth.A.Foughty@nasa.gov

Dawn M. McIntosh

NASA Ames Research Center
Moffett Field CA 94035
Dawn.M.McIntosh@nasa.gov

Bryan L. Matthews

Perot Systems, Inc.
NASA Ames Research Center
Moffett Field CA 94035
Bryan.L.Matthews@nasa.gov

Abstract

DASHlink is a public NASA research collaboration website. Web 2.0 style content generation and social software technologies along with a community-moderated posting policy make it easier and faster for NASA scientists and research partners to share data and knowledge with each other and the general public. Designing and building an open collaboration website tested the boundaries of government information sharing rules and policies. In this paper we describe our experiences with and solutions to government specific design challenges.

Keywords

collaboration, web 2.0, social software, user-generated content, government, policy

ACM Classification Keywords

H5.3. Group and Organization Interfaces: Collaborative Computing

Introduction

The DASHlink community website [1] supports NASA scientists and their outside partners with research activities. Web 2.0 technologies enable them to more easily use the web to share data, informally discuss results, contact potential collaborators, and accomplish other day-to-day research tasks. Virtually all of the

site's content is produced by registered members, and in the spirit of open innovation all content is accessible to the general public. While this may be standard for many commercial and institutional websites, *DASHlink* is, to our knowledge, the very first public-facing NASA website to permit community-moderated user-generated content.

Other government agency websites employ Web 2.0 social software but in a more limited fashion. For instance, the U.S. State Department moderates public comments on its blog [2]. NASA itself uses social networking software for public outreach, such as personalized homepages on nasa.gov [3], open source collaboration [4], and scientific information aggregation [5]. Yet these sites fall short of the ideal of an open government collaboration website where community members, and not NASA officials, have responsibility for the content and use of the site.

Building an official NASA website with community-moderated content is a daunting task owing, in part, to NASA's complex policies and processes regulating the public release of information. We chose to account for policy and regulations, as well as user and stakeholder needs, in our design. As part of this effort, we engaged policy makers in our development process, and included policy analysis and negotiation into the design-development cycle.

Developing a vision

The *DASHlink* project arose as part of a major NASA aviation safety research program. The site is designed to fulfill two major program needs: to increase partnership and collaboration between the computer science (specifically data mining) and aerospace

systems research communities, and to more widely disseminate research results, algorithm codes, and NASA generated data sets to the data mining community and general public.

The website supplements traditional dissemination channels such as journal articles and conference presentations. A limitation of these channels is researchers do not share ideas until they have a major result. This is due to the nature of formal publication and to the time and effort required to write and obtain NASA approval to publish. Further, these channels reach a small audience. We believe current Web 2.0 content generation and communication technologies make it easier and more worthwhile to share preliminary results and putting these on the Internet results in a wider audience. The transparent and participatory culture of Web 2.0 precisely matches the collaborative research spirit that we wanted to cultivate and thus became the core of the *DASHlink* website. Our vision was and still is ambitious:

- Create a website with all content, including that generated by the community, accessible to the general public.
- Employ social networking features to better facilitate collaboration.
- Include easy-to-use content creation features and change policy so users can use those tools without undergoing time-consuming processes.
- Make *DASHlink* an official NASA ".gov" site.

Design issues

Our decision to create an official NASA .gov site was critically important. We knew of no precedent for a

community-moderated official NASA website. When discussing Web 2.0 use with other NASA website projects, we found that they chose to avoid the regulations and policies levied on official sites by hosting user forums on non-government sites [6] or using the .org domain [7]. We believed it was worth the effort to work with website officials and within NASA rules and regulations to evolve NASA's culture.

Our first attempts to obtain approval from officials were met with resistance. Without a precedent to refer to, officials responded conservatively. We also received resistance from our prospective users. NASA researchers, used to undergoing a sometimes-lengthy approval process prior making information public, were unaccustomed to using the web to present preliminary and ongoing research.

Another cultural issue we encountered was that our researchers automatically assumed web software developed internally for their use would be put on the private intranet. Even after they understood and accepted the idea of using a fully public site, they had difficulty determining if any part of their current work was sufficiently "public" to be posted. Additionally, there was unexpected resistance from those concerned about users who might post with little consideration made to what belongs on a government-owned and operated website.

Modified design process

We used the customer-centered design methods outlined in [8] to understand user and stakeholder needs and to incorporate them into the design. To address organizational culture issues, we communicated frequently with our user community as

the design progressed. We presented proposed features and community policies to them using mockups and prototype webpages. We crafted the website Terms and Conditions to address their concerns regarding liability for the content they post, personal privacy, and the credibility of content posted by others. When pressured to create a private side to the website, we responded by trying to educate our users, repeatedly emphasizing to them the benefits of a public website for developing new collaborations and ideas.

Our participatory design methods included not only our user community, but also the policy and legal teams who had the responsibility to examine and approve our designs. We modified the customer-centered process to incorporate legal approval steps into the design evaluation step. From the earliest development iterations, our design team met with NASA officials to interpret policy, evaluate our design, and negotiate necessary modifications to both the design and policy. We stayed mindful of possible policy implications as we designed new features. In the same way that we might generate design alternatives based on user preferences or available technologies, we generated design alternatives to respond to different possible negotiation outcomes.

Design decision influenced by government policy and culture

The registration process provides an example of where our website design was affected by decisions from NASA officials. In an early design we proposed a standard site registration process with registration open to anyone. NASA officials, concerned about unknown users posting to an unmoderated NASA website, would not approve this design. After discussions with the legal

team, we proposed a registration policy and process that was satisfactory to NASA but also less straightforward for some of our users. In this compromise, any NASA Civil Servant (CS) can register, registration by any anyone not a NASA CS requires approval, and only registered members can post content. Though this compromise results in an extra registration step for some users, community moderation was so crucial to our goal of open collaboration that we decided it was a reasonable tradeoff.

Outcome

Based on the generated content (61 Topic pages) which addresses both dissemination and collaboration (~25% of the Topics have one or more comments), in addition to the increasing number of registered users and session counts, continuing to confirm growing activity, the basic design process appears to be successful. Furthermore, since public release six months ago, we have had over 10,000 downloads of material from the site (indicating its usefulness for dissemination) and 78 uses of the "contact member" feature (indicating the importance of *DASHlink* for connecting researchers). Users have responded positively to the *DASHlink* site, specifically the ease of contributing content, the simple navigation, and the domain specific information it makes available.

Lessons learned

At the outset, we knew it would be challenging to design and obtain approval for a community-moderated official public NASA website. It is likely that other agencies have run into similar issues with policies written for traditional media and with cultural resistance to open collaboration. We were successful

because we worked together with policy makers and policy compliance officers early on. When we showed them the value behind our design decisions, they were willing to work with us. And we found unconventional solutions to the issues that the policy makers would not budge on. Cooperation, along with creativity, made it possible to find solutions to daunting policy-created design problems.

Acknowledgements

This project was funded by the Aviation Safety Program under NASA's Aeronautics Research Mission Directorate. The authors thank Rob Padilla, legal advisor at NASA Ames Research Center for his legal perspective, assistance, and support of this pioneering website. We also acknowledge and appreciate the insight and contributions of our software developers, Chris Fattarsi, Sergei Yentus and Dave Kluck, and our graphic designers Eric Titolo and Ray McIntosh.

References

- [1] <https://dashlink.arc.nasa.gov/>, *DASHlink* website.
- [2] <http://blogs.state.gov>
- [3] <http://mynasa.gov>
- [4] <http://colab.arc.nasa.gov>
- [5] <http://astrobiology.nasa.gov/nai>
- [6] <http://worldwind.arc.nasa.gov>
- [7] <http://nasacolab.org>
- [8] Van Duyne, D.K., Landay., and Hong, J.I., *The Design of Sites*, 2nd Edition. Prentice Hall, Upper Saddle River, NJ, USA, 2007.