**Alexander Halavais**

# DO DUGG DIGGERS DIGG DILIGENTLY? Feedback as motivation in collaborative moderation systems

*The commenting patterns of a sample of 6,468 users on Digg.com demonstrate that feedback from other users affects participation in three ways. First, the more explicit feedback a user receives, in the form of moderation votes on their comment or responses to their comment, the sooner they contribute again. Second, commenters generally become more able to generate feedback as they become more experienced contributors to the site. Third, there are some common features of comments that receive more feedback, and the feedback system reinforces these standards. By making the process of community feedback relatively accessible and measurable, Digg provides an opportunity to observe the process of socialization into a community and inculcation of community standards.*

**Keywords** Computer-mediated communication; interactivity; Web 2.0

There has been growing interest in a cluster of applications that promote active participation and contributions by users on the web. Why users contribute to these sites remains an interesting and important question. The work presented here explores the idea that contributions are encouraged by the explicit acknowledgement of other users of a sociable site, and that this helps to shape the participation by users, as well as the content of the site.

Digg.com represents one of the more popular collaborative filtering sites, allowing users to contribute to a mediated conversation regarding what constitutes content worth viewing on the web. Bookmarks and abstracts of web sites are voted on by members, and those bookmarks with a large number of positive votes are featured more prominently on the site. Likewise, in discussions regarding these sites, those comments judged by the community to be most salient are identified through a process of voting. While this process may be intended as a method of filtering content, it indirectly serves as a way of shaping participation on the site, encouraging behaviors and the sorts of content that conform to the expectations of the community, or, less frequently, behaviors orthogonal to those expectations.

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In what follows the behavior of a sample of users of the Digg site are evaluated. First, the degree to which feedback affects their likelihood and timing of future contributions is examined. Then, the evolution of their contributions over time is evaluated, to determine whether they receive increased amounts of feedback as they become more experienced. Finally, the content of these contributions is analyzed to see whether there are particular elements that make a comment more likely to receive feedback.

## Motivation to participate

The question of what motivates someone to become part of an organization, and to remain a participant, has a long history, and research into the reasons for such participation has been reignited by the popularity of social media sites. Take, for example, Wikipedia, a site that consists of several million articles written by a global crowd of volunteers. As with open source software and other forms of open media, the motivations of those contributing to Wikipedia are multidimensional, and range from the joy of writing, to an opportunity to learn new things, to a desire to contribute to knowledge in the global society (Nov 2007). Schroer and Hertel (in press) argue that in addition to the intrinsic rewards of contributing to **Q4** Wikipedia, some of the motivations of Wikipedia volunteers are similar to those of people who become a part of more traditional social movements. Clary *et al.* (1998) develop an inventory of motivations for volunteering, which they divide into six categories. The last of these categories, 'enhancement' motivations, address the need for recognition, personal growth, and self-esteem. Lampel and Bhalla (2007) suggest that this desire to be recognized and achieve status is particularly important to understanding the motivations of those who contribute to virtual communities.

At a basic level, recognition exists in response or other forms of interaction. Although the definition of 'interaction' remains problematical, it seems clear that the idea of some form of response – and continued conversation – is central to it (Jones & Rafaeli 1999). Investigations of the relationship between feedback and the motivation or propensity to continue contributing to a site have been relatively sparse. Wittaker *et al.* (1998) provide some indication of the behavior of Usenet posters, but only hint at the potential impact of unanswered posts. More recently, Huberman *et al.* (2008) have examined the relationship between the number of downloads a user's YouTube video receives, and the likelihood of that user continuing to contribute to the site. If there is a relationship between response and motivation to post, we might expect to see this in the existence and timing of future posts by a user who has received some form of feedback.

The relative anonymity of the internet undermines trust, and makes it difficult to know whether someone is likely to deliver on a promise, in the case of commerce, or if the information they provide is worthwhile. Over time, ways of establishing credibility have emerged to provide for social awareness of other users (Smith 2003). The effect of such reputation systems on eBay and similar online marketplaces has been well studied (Jøsang *et al.* 2007; Bolton *et al.* 2005; Houser & Wooders 2006; Resnick *et al.* 2000). Collaborative filtering systems are in some ways a subset of reputation systems. Especially when there is an excess of content, users require a way of evaluating what is worthwhile and what might effectively be ignored. As the social web has expanded, the number of people contributing content to the web has far outstripped the abilities of traditional editors or moderators, as well as most search engines, and the content produced is often overwhelming to users without the help of some sort of filtering or ranking system. Particularly over the last few years, a number of collaborative filtering systems, including Digg, del.icio.us, StumbleUpon, and dozens of others have rushed to fulfill this need.

One of the first large-scale collaborative blogs, called Slashdot, faced the problem of information overload early in its existence, as the number of people commenting quickly outstripped the ability of a visitor to effectively read through the comments. To help sort these comments into those most and least valuable to the community, Slashdot instituted a system that allowed random visitors to add or remove a point from the overall score of a given comment. The result was a form of collaborative moderation expressed in the scores associated with each comment. A reader who was not acting as judge could easily filter out all comments below a certain threshold, and read only the cream of the crop.

Slashdot and similar systems create a community ranking of the importance of various comments. Ideally, this results in making more salient those comments most deserving of an audience (Poor 2005). Of course, there can be intrusions of external forces, such as ownership structures or legal battles (Ó Baoill 2000). For example, Digg found itself in the awkward position of removing comments that might violate copyright law, and has had to face other criticisms over manipulations of the rating system (Stone 2007; Arrington 2008). In addition, just as with any other form of editorial control, the community itself can act as a censor and the ease with which collective opprobrium can be expressed enhances the potential for groupthink. Lampe and Resnick (2004), in an examination of Slashot's moderation system, found that early assessments often had a disproportionate impact, and that it sometimes took a long time to highlight the most popular posts. But more than that, by design, minority opinions tend to be overlooked, as they are in many non-virtual communities.

More than merely filtering comments, these ratings provide the means for expressing the collective will. In any community, there is a process of initiation during which an inductee learns to abide by the mores of the community, and there are a range of social controls that enforce the local mores. Although a range of mechanisms have evolved, many virtual communities lack the ability to reflect approval easily – the virtual equivalent of a smile and or nod, or its opposite, the virtual evil eye. Collaborative moderation systems provide this opportunity, if unintentionally, through little more than a click.

## Responses to evaluation

The rise of these new social websites means an explosion of opportunities for the public or collective to judge individuals' contributions. But such rankings are not just a way of evaluating people's past behavior in order to predict their future behavior. The mere existence of public metrics is likely to change the behavior of users, depending on the likelihood of someone continuing to interact in the environment. Robert Axelrod has called this effect the 'shadow of the future' (2006, p. 12), and suggests that those who intend to continue to interact are more likely to be affected by how others perceive their current and past work.

The initial reason for assigning points to a comment may be to filter it, but at the same time it serves as a way of rewarding or punishing the user. Rather than having a message move silently into the ether of the internet, scores and textual responses provide a way of rewarding participation, and encouraging more participation. There are several ways in which the community can interact with a contributor, most obviously by engaging her in some form of interactive conversation. In the absence of such cues, the simple click in agreement or disagreement by a large number of readers provides some feeling that the message has been read and that it has either persuaded the community or met with resistance.

Earlier attempts to understand the evolution of a user within a collaborative moderation system have focused on Slashdot. Halavais (2001) examined the change in the average moderation score for a poster over time, and found that there appeared to be a period of learning, followed by a leveling off of comment scores, as the user seemed to become less driven by outside moderators' opinions. Actively seeking approval in the moderation – or 'karma whoring' – was seen as something worthy of censure; good ratings were supposed to accrue naturally. Among other indicators, Lampe and Johnston (2005) measured the patterns of the first three posts of new users on Slashdot. They found that any moderation (positive or negative) made a follow-up post more likely, and that some proportion of the users took on the role of 'troll', and sought out negative responses.

## The dynamics of Digg membership

Approaches similar to that of Slashdot are now employed by many services that seek to sort the web into its most and least interesting pages. The Digg site applies a collaborative moderation model to the web at large, allowing users to ‘digg’ a site, resulting in the site’s score being increased by one. Like Slashdot, Digg also allows users to comment on particular sites. This study focuses on the latter process, creating comments and ranking the comments of other users.

Not all users participate in discussions within the comments for a particular page, but those who do may also find their individual comments ‘dugg’ or ‘buried’ by their fellow users. Figure 1 shows a typical page on Digg, here referencing an article on the ‘death of voicemail’, and linking to the page on which it appears. This page has received a total of 3,265 diggs, suggesting that it is quite popular among users. The first three comments appear at the bottom half of this figure. The first of these comments, by a user named ‘smitas’ has been unpopular, receiving enough ‘buries’ to result in an overall score of −57. Both this comment and comments replying to it are not immediately visible to the user, having fallen below a user-specified limit that defaults to zero. If interested, the user can still click through to reveal what was written.

The second comment has been widely heralded by Digg users, and its response is relatively well liked as well. These naturally raise some questions: Is writing a popular message a fluke? Does ‘uncouthyouth’ consistently receive many diggs from his fellow users? If so, how did he become a star Digger?

Digg is not the only site to attempt to harness popular opinion to help sort the web. Dozens of similar sites exist, and this social approach to search is


**FIGURE 1** Example of an article on the Digg site.

being used in increasingly broader contexts. Observing some of the ways in which people are influenced by such explicit appraisals of their contributions is useful for understanding how collaborative systems like Digg work. As more and more sites, from YouTube to news sites and search engines, incorporate similar systems for awarding contributions, such an understanding becomes even more important.

The existing literature on the relationship of user behavior to moderation systems in online communities suggests a series of questions about how Digg users learn to become part of the system. First, as suggested by the title of the article, what is the relationship between the propensity to comment and the moderation a user receives? Does a positive or negative response from the community result in a quicker follow-up? What pattern, if any, is likely to result in a user ceasing to comment? Overall, is there a pattern of learning over time (or over posts) that may be discerned? Can cases that do not fit this pattern be categorized? Second, what can the topics, style, and structure of the comments themselves tell us about what makes a popular (and conforming) comment on Digg? Students and employees are often given a rubric that should lead to successful evaluation; can we assemble a guide to help lead us to the 'A' comment?

## Collecting comments

Becoming a registered user of Digg does not require payment. People become members in order to participate actively in some way. In order to submit suggested links to the site, to vote links to pages up or down, to comment, or to vote comments up or down, a user must establish a membership on the site. There are some indications of the demographic characteristics of users (Brown 2006; Bogatin 2006), but these are not consistent and the nature of the site continues to change.

Like many popular online sites, Digg provides an application programming interface (API) that allows the content of the site to extracted relatively easily **Q1** (Digg 2008). The total number of users registered on the site was just over 2.8 million at the time of sampling. An initial sample of 30,000 users was selected randomly. For each of these users, all of the comments they have made on the site were downloaded, along with the total number of digg and bury votes each comment received, how many replies were made to the comment, and the date and time of the comment. The collection, taken in July 2008, includes only members who joined between December 2004 and May 2008.

A total of 197,658 comments were collected, contributed by 6,468 users. Of the initial sample of 30,000, a substantial proportion (23,532) had never posted a comment, and an additional 2,728 had posted only one comment, meaning that frequent commenters make up a relatively small proportion of the whole. In fact, the most frequent commenter in the sample made an astounding total of 6,598 comments. As with many similar participatory sites, the number of comments per user follows a power law distribution.

## A delay in commenting

One of the possibilities suggested above is that positive reinforcement, in the form of diggs to a comment, may reduce the time it takes for that commenter to post again. That is, commenters, recognizing some form of reaction from the community, may be more motivated to comment again, and this comment may occur sooner than it would otherwise. This may be examined by comparing the final comment scores (the diggs less the buries) with the time before the next comment by the same user, for the cases in which there is any subsequent comment. We might also examine the cases where there is not (yet) a subsequent comment, and see whether the lack of feedback may precipitate exit from the community or long-term delay in contributions.

In each case, some significant assumptions are being made. First, it is assumed that users are aware of the final score for their comments when they make a subsequent comment. While it is fair to suggest that this may be the case, it is equally possible that they have commented before viewing any reactions. Indeed, someone may respond to several other comments on a story without ever seeing how their own comments have been reviewed. We do not have access to information about when diggs occurred for each comment. Moreover, some users may pay no attention at all to how their comments are received.

It may be assumed that the influence of diggs is weaker immediately after posting a comment (before others have had a chance to assess the comment), and so only those comments with a minimum separation of five minutes – a total of 138,360 comments – were considered in an examination of delays between commenting. The five minutes provides some padding for users to receive initial feedback on their comment; it is safe to assume that users with comments in immediate succession have not had an opportunity to receive and review feedback on their most recent comments. Of these, only a relatively small proportion (11,109) received neither up nor down ratings from the community. However, users who posted these ignored comments did not post again for an average of 19.8 days ($SD = 63.5$), while those users who received any sort of reply posted again after an average of 6.1 ($SD = 27.7$) days.

The total number of diggs on a particular comment appears to matter less to the time it takes for a user to once again contribute than whether a comment was rated at all. A small negative correlation (Spearman's $\rho$, $p < 0.001$) exists between the total diggs and the time before the next comment ($-0.10$), as well as between the buries and time to the next comment ($-0.06$), and replies and time to the next comment ($-0.04$). In other words, there is clear evidence that feedback encourages users to return more quickly to commenting on Digg, although the linear relationship between the amount of feedback and the time before returning is not strong.

A large number of comments (19,287) had no following comment in the sample. In some cases, it may simply be that this was the last comment within the sample period, but in others, it represents the user's final contribution before departing from Digg. Comments that were potentially 'final' tended to have received fewer diggs (an average of 3.0, as opposed to 6.6 for those with subsequent comments), fewer buries (1.4, as opposed to 2.7), and fewer responses (0.3, as opposed to 0.5) on average. It is tempting to infer that lower responses result in users losing any motivation to continue contributing to the site. However, it may be that those who intend to cease contributing comments are simply not be as invested in making a comment that encourages **Q2** feedback.

While it is impossible to ascribe any causality to these relationships, it appears that any form of feedback or communication is likely to relate to future contributions by the same user. The greater the response to a given user's contribution – in terms of diggs, buries, or comments in response – the sooner that user is likely to contribute again.

## Learning to Digg

If more feedback is related to more frequent contributions, we would expect that comment scores for any individual user would increase over time, if there is any way to learn to increase scores. By looking at the progression of comment ratings over the history of individual users' postings, it is possible to discern whether the community considers the quality of those posts to be increasing. Simply stated, for any user, the fifth posting should receive a higher score than the first, and the tenth should receive a higher score still. Posts made by more experienced users (in terms of the number of comments they have contributed) are positively correlated with favorable diggs (0.28), as well as with buries (0.11), and replies (0.08). The moderately strong correlation between commenting experience and diggs is perhaps unsurprising, if we assume that users are aiming for higher overall scores. The increase in buries, as well, suggests the possibility that experience improves the ability to get any reaction, whether positive or negative. In any case, the ability to attract a greater reaction from the user community suggests that users learn how to become more successful posters, if success is gauged by increased feedback. The median comment score (of diggs less buries) for the first post through the third post is 0, it is 1 for the fourth post through the twelfth, and from there it levels off to 2.

It is unclear from these figures whether the learning that we are measuring is occurring on an individual basis, or if we are observing a community process. That is, the average amount of feedback on a comment (diggs, buries, and replies) may be increasing over time as those unable to garner reactions from others in the community feel ostracized, self-deselect, and cease commenting. In order to establish individual learning, we can limit ourselves to examining members of the community that have made a more sustained contribution to the discussion, while excluding those who drop out or are early in their tenure at Digg. Of those who have contributed 30 or more comments (a total of 812 users from the sample), can we detect an increase in their average number of diggs over time? In examining their first 30 comments, it is clear that attrition (users leaving the system after only a few comments) does have an effect, but that experience still results in positive correlations, at least with diggs received (0.19). The correlations with buries received (0.03) and with responses received (0.02) by these more experienced contributors are negligible.

Such an ambivalent correlation to buries hides the fact that while some users are learning to receive better positive reinforcement (diggs) and avoid negative reinforcement (buries), a small number of users are learning just the opposite, and seeking out ways of become less admired by their fellow Digg users. Among these 812 users, 170 had a negative average over their first 30 entries. The posting record of the lowest of these, a user that accomplished an average score of −11.6 over the course of their first 30 posts, had only a single post that rose above a zero total score. Most of these comments were laced with racial, religious, and gender slurs, profanity, and entirely irrelevant interjections. It seems clear that this user, along with many of the other users at this end of the spectrum, was seeking to receive negative feedback (whether in the form of buries or responsive comments) from the Digg community.

On the other hand, it is difficult to ascribe motives purely on the basis of the posting content. It is interesting to note that the user with the highest average score over these first 30 posts (33.2) is clearly trying to work out what kinds of comments make sense on Digg. After 24 posts with lackluster responses, that user posts a series of four comments in a row, each responding to the last, satirizing clichés common to discussion on Digg. These each receive well over 100 diggs. Had we cut off the analysis after ten comments, it would have been easy to label this user a troll, when in fact it appears that they were merely doing their own examination of what works and what does not when seeking out feedback on Digg.

## Words worth digging

If users on Digg are learning to construct more popular comments, there should be some way of discovering what separates the comment worthy of praise from that worthy of scorn; and both from the comment that is merely overlooked. As in other online discussion forums (e.g. Arguello *et al.* 2006) certain topics and styles of discourse are more likely than others to garner diggs. One way to discover these is by examining word frequency among high-, non-, and negative-scoring comments to see whether they indicate significant differences.

Words found in the comments among three collections were examined to explore differences between comments receiving overall positive, negative, and no responses. The datasets included all comments that received a minimum overall score of 15 (a total of 12,339 comments), those that received a maximum score of −15 (a total of 2,717 comments), and those that received not a single digg or bury (a total of 16,016 comments). Note that the smaller collection of heavily buried comments is likely due to the nature of the Digg interface, which makes less visible those comments already scored below zero.

A program was constructed that extracted each word (defined as any group of consecutive letters) and calculated the ratio of its frequency in each collection to its frequency across all three collections. The result was a ranked list of words that appeared disproportionately frequently in each of the three collections, excluding any common 'stop words' ('the', 'of', etc.). As an illustration, the top 15 words from each group appear in Table 1. These listings mean little on their own, but provide some direction for exploring the kinds of comments that seem to be more prevalent in each group, and might therefore be indicative of differences.

Because all words, including consecutive letters within URLs, are counted, one of the more noticeable differences is the relative lack of hyperlinks among the most and least popular comments. Among those comments in the sample

**TABLE 1** Words appearing more frequently in collections of highly rated, unrated, and negatively rated comments.

| | *positively rated* | *unrated* | *negatively rated* |
|---|---|---|---|
| 1 | University | http | Obama |
| 2 | When | Com | Down |
| 3 | United | www | Ron |
| 4 | Man | User | Paul |
| 5 | After | Php | Watch |
| 6 | Fuck | Class | Flip |
| 7 | Watch | Bizimle | Wii |
| 8 | Fake | Turkachat | Linux |
| 9 | YouTube | Site | YouTube |
| 10 | Wollersheim | Senpai | Dugg |
| 11 | Fucking | Html | Know |
| 12 | Scientology | Wizard | Funny |
| 13 | Paper | Stretch | Vista |
| 14 | Time | Free | Iraq |
| 15 | States | Artist | Buried |

that were largely ignored, a total of 11 percent (1,766) contained links, while among those with scores of 15 or higher and of $-15$ and lower, only 5 percent (618 and 134, respectively) contained hyperlinks ($\chi^2 = 326.99$, $p < 0.0001$). The nature of these links is fairly similar, with the majority leading to other parts of Digg, to Wikipedia, or to image or video hosting services.

Profanity seems more likely to be dugg, along with discussion of sex. It should be noted, however, that the most buried comment, with a final score of $-1,050$, was a single 'BULLSHIT!' This was in response to an article that could be seen as critical of Apple users, the source of the sort of strife usually reserved for religious conflicts. The exception, here, is that racial and gender epithets tend to result in comments being buried, as does the use of the word 'liar', particularly when applied to another Digg user. And in contrast to such *ad hominem* attacks, users who provide facts and locate further information in support of their arguments tend to receive more diggs. Although hyperlinks are less common among the highly ranked examples, when they are used, it is often as a citation. For example, one user ('cholland') presented a quote from the president, followed by a link to the source document.

The names of presidential candidates tend to result in buries. This is particularly true of Ron Paul, whose supporters made a concerted effort to leverage Digg to publicize their candidate's positions, to the consternation of many Digg users. The word 'Obama' appears disproportionately among the most buried stories. These are, with very rare exceptions, comments critical of the candidate that have been buried.

One of the words most disproportionately related to burying is 'Digg'. Mentions of the name of the site are generally in the context of meta-criticism: complaining in stereotypical terms about Digg users, expressing dismay at the particular score for a comment or article, or claiming that the system is rigged in favor of particular positions, for example. Such comments are regularly buried, as are (unless done with panache) criticisms of spelling or grammar.

It appears that certain phrases and styles tend to garner more diggs from fellow adherents. The word 'university' appears disproportionately in comments that have received a large number of diggs. In many cases, it appears that this is a reflection of school spirit among a user base that may be largely college-aged, though particularly in the highest scoring comments, it is often associated with a researcher who is being cited in order to support a particular position. The term 'United States' was common among the highest scoring comments, while 'America' tended to be less common, the former label tending to be used in a more neutral way than the latter. While the length of each comment appears to have no relationship to the overall score the comment receives, comments with a larger number of newlines (that is, those that had more formatting) tended also to have more diggs.

Finally, it appears that one of the most common characteristics of comments that receive a large number of diggs was the presence of humor, and particularly jokes that relied on a knowledge of some of the popular discussions over the history of the site. Overall, although there are clearly differences between the highest rated content and content that is either buried or ignored, those differences are complex and multi-dimensional. Nonetheless, there is an indication that these community standards are understood by those who continue to post comments to the site, as those comments generally garner increased diggs as users become more familiar with what is of interest to the community.

## Discussion and conclusion

The work described above shows that there is a relationship between the formal elements of the user interface and the ways in which users come to engage in discourse. Mechanisms intended to act as community filters of content are also applied as filters of community participation. Digg's ability to easily indicate the support or rejection of individual users' contributions provides an explicit way of indicating how well individuals' expressions fit the expectations of the community. This provides an explicit indication of status for the author of a comment, and is clearly related to the motivation to actively contribute future comments.

There are certainly a number of other complex motivations for posting frequency and continued membership in a community. The above, for example, does not address the importance of social networking on the Digg site, and the influence of friends on the focus of attention (see Lerman 2007). However, the explicit approval or condemnation of a comment – and by extension, the commenter – provides an important social cue within online environments that increasingly rely more heavily on communities to provide and filter media content.

We can conclude that those who comment on Digg generally become better at it with experience, but the question remains: what does 'better' mean? There has been some concern that discussions in online venues can be drawn to extremes, that the 'race to the bottom' observed in other media – the tabloidization of the news media, or the rise of reality television are often proffered as examples – applies also in a community where the audience can more easily express its view. Does this lead to what many have identified as the potential for dangerous polarization (Sunstein 2002; Alstyne & Brynjolfsson 2005), or does it provide support for more collaborative discursive processes?

The idea that a filtering mechanism provides for some form of rational, objective quality, rather than some collective ideal, seems very unlikely. In other words, while a tool may provide the means for deliberation, the make-up of the community and its choices matters at least as much. Sunstein (2006) provides Wikipedia as an example of a community that, as a whole, has a constructive ideal in mind and manages to enact this using a wiki as a tool, and provides a counter example, the failed *Los Angeles Times* experiment with a wiki, to show that the same sort of tool can result in a different outcome. An initial examination suggests that in the case of Digg, the tool is being used to encourage discussion rather than invective. Personal attacks tend to be buried, and supplying evidence is encouraged, both of which seem to play toward a deliberative ideal. Digg does not seem to embody the very negative form of anonymous sniping often identified by critics of online discussion.

On the other hand, neither does it provide a model of Habermasian deliberation. Style is rewarded, and the entertainment value of a contribution, particularly when paired with an opinion, tends to result in the comment's promotion. There is always the temptation to dismiss humor from serious talk, an outgrowth of the culture industry critique and the potential of narcotizing dysfunction. Indeed, Habermas's view of rational discourse at the root of deliberative process appears to leave little room for humor. Nonetheless, humor and wit have a long history in public discussion over serious matters (Ruhlmann 2007), and some have suggested that we should reserve space for unreasonable discussion, including humor and self-interested claims, in public discourse (Johnson 1998). Digg may represent a model of discourse that diverges from rational deliberation, and instead replicates the kind of ordinary conversations about politics and other matters that occur in many settings. As such, it may not be deserving of the scorn some reserve for online discussions (and discussants), but neither is it deserving of elevation to some idealized form of democratic, public discourse. Schudson (1997) draws a distinction between ordinary **Q3** public conversation, and democratic deliberation; the latter of which is 'not essentially spontaneous but essentially rule-governed, essentially *civil*, and unlike the kinds of conversation often held in highest esteem for their freedom and their wit, it is essentially oriented to *problem solving*'.

The mistake, perhaps, is to assume that the technological structures that influence filtered conversations like those that appear on Digg are designed to further deliberative processes and do so successfully. While it may be the case that those who engage in discussion of public issues online are different from those who engage in such discussions offline (Stromer-Galley 2002), the nature of those discussions may not differ significantly. The collaborative moderation found on Digg appears to simulate the kinds of communal restrictions on conversations found in offline venues. As Lefebvre notes, social spaces consist of 'objects, both natural and social, including the networks and pathways which facilitate the exchange of material things and information', (1991, p. 78) and these objects are transformed by those who use them. This is as true of social websites as it is of traditionally physical social spaces.

At present, those controls provide a boundary on the sort of radically open discursive space we still associate with online discussion, inscribing the sorts of communal restrictions we find on discussions in the real world. Naturally, the anonymous nature of Digg allows for different kinds of engagement, and the 'shadow of the future' may not be as dark in such self-contained communities. Nonetheless, as the penumbra of communal control extends its way through online worlds, binding together identities and relationships, mechanisms designed to make visible these boundaries are likely to play a more important role.

It might be assumed that when systems of ranking and filtering are established in a community – whether online or offline – this results in changes in the behavior of its members. The research reported here suggests that the filtering system that makes Digg so successful as a destination also enforces a process that trains users to behave in ways that conform to community standards and expectations. There are no doubt any number of tacit ways in which this process occurs, but at least in its most explicit form, there is a clear relationship between the systems of conversational control on Digg, and the behavior of Diggers.

## References

Alstyne, M. V. & Brynjolfsson, E. (2005) 'Global village or cyber-Balkans? Modeling and measuring the integration of electronic communities', *Management Science*, vol. 51, no. 6, pp. 851–868.

Arguello, J., Butler, B. S., Joyce, E., Kraut, R., Ling, K. S., Rosé, C. & Wang, X. (2006) 'Talk to me: foundations for successful individual–group interactions in online communities', in *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, ACM, Montréal, pp. 959–968.

Arrington, M. (2008) 'Gosh, how many diggs does it take to get to the home page, anyway?' *TechCrunch*, [online] Available at: http://www.techcrunch.com/2008/07/09/gosh-how-many-diggs-does-it-take-to-get-to-the-home-page-anyway/ (31 October 2008).

Axelrod, R. M. (2006) *The Evolution of Cooperation*, Basic Books, New York.

Bogatin, D. (2006) 'Digg: Kevin Rose talks "The Real Deal" in exclusive interview', *ZDNet*, [online] Available at: http://blogs.zdnet.com/micro-markets/?p=446 (31 October 2008).

Bolton, G. E., Katok, E. & Ockenfels, A. (2005) 'Cooperation among strangers with limited information about reputation', *Journal of Public Economics*, vol. 89, no. 8, pp. 1457–1468.

Brown, S. (2006) 'The demographics of Digg', *modern life*, [online] Available at: http://www.modernlifeisrubbish.co.uk/article/the-demographics-of-digg (31 October 2008).

Clary, E., Snyder, M., Ridge, R., Copeland, J., Stukas, A., Haugen, J. & Miene, P. (1998) 'Understanding and assessing the motivations of volunteers: a functional approach', *Journal of Personality and Social Psychology*, vol. 74, no. 6, pp. 1516–1530.

Digg (2008) 'Digg API wiki', [online] Available at: http://apidoc.digg.com/ (31 October 2008).

Halavais, A. (2001) *The Slashdot Effect, Analysis of a Large-scale Public Conversation on the World Wide Web,* PhD dissertation, School of Communications, University of Washington, [online] Available at: http://alex.halavais.net/research/diss.pdf (31 October 2008).

Houser, D. & Wooders, J. (2006) 'Reputation in auctions: theory, and evidence from eBay', *Journal of Economics & Management Strategy*, vol. 15, no. 2, pp. 353–369.

Huberman, B. A., Romero, D. M. & Wu, F. (2008) 'Crowdsourcing, attention and productivity', [online] Available at: http://arxiv.org/abs/0809.3030v1 (31 October 2008).

Johnson, J. (1998) 'Arguing for deliberation: some skeptical considerations', in *Deliberative Democracy*, ed. J. Elster, Cambridge University Press, Cambridge, pp. 161–184.

Jones, Q. & Rafaeli, S. (1999) 'User population and user contributions to virtual publics: a systems model', in *Proceedings of the International ACM SIGGROUP Conference on Supporting Group Work*, ACM, Phoenix, pp. 239–248.

Jøsang, A., Ismail, R. & Boyd, C. (2007) 'A survey of trust and reputation systems for online service provision', *Decision Support Systems*, vol. 43, no. 2, pp. 618–644.

Lampe, C. & Johnston, E. (ed.) (2005) 'Follow the (slash) dot: effects of feedback on new members in an online community', in *Proceedings of the 2005 International ACM SIGGROUP Conference on Supporting Group Work*, ACM, Sanibel Island, Florida, pp. 11–20.

Lampe, C. & Resnick, P. (2004) 'Slash(dot) and burn: distributed moderation in a large online conversation space', in *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems,* ACM, Vienna, pp. 543–550.

Lampel, J. & Bhalla, A. (2007) 'The role of status seeking in online communities: giving the gift of experience', *Journal of Computer-Mediated Communication*, vol. 12, no. 2, article 5, [online] Available at: http://jcmc.indiana.edu/vol12/issue2/lampel.html (31 October 2008).

Lefebvre, H. (1991) *The Production of Space*, Blackwell, Oxford.

Lerman, K. (2007) 'Social networks and social information filtering on Digg', in *Proceedings of the International Conference on Weblogs and Social Media*, Boulder, Colorado, [online] Available at: http://www.icwsm.org/papers/paper42.html (31 October 2008).

Nov, O. (2007) 'What motivates Wikipedians?' *Communications of the ACM*, vol. 50, no. 11, pp. 60–64.

Ó Baoill, A. (2000) 'Slashdot and the public sphere', *First Monday*, vol. 5, no. 9, [online] Available at: http://firstmonday.org/issues/issue5_9/baoill/index.html (31 October 2008).

Poor, N. (2005) 'Mechanisms of an online public sphere: the website Slashdot', *Journal of Computer Mediated Communication*, vol. 10, no. 2, article 4, [online] Available at: http://jcmc.indiana.edu/vol10/issue2/poor.html (31 October 2008).

Resnick, P., Kuwabara, K. & Zeckhauser, R. (2000) 'Reputation systems', *Communications of the ACM*, vol. 43, no. 12, pp. 45–48.

Ruhlmann, J. (2007) 'Comique, éloquence et discours politiques en «voix» de réhabilitation', *Histoire@Politique*, vol. 1, [online] Available at: http://www.histoire-politique.fr/index.php?numero=01&rub=pistes (31 October 2008).

Schroer, J. & Hertel, G. (in press) 'Voluntary engagement in an open web-based encyclopedia: Wikipedians, and why they do it', *Media Psychology*. Q4

Schudson, M. (1997) 'Why conversation is not the soul of democracy', *Critical Studies in Mass Communication*, vol. 14, no. 4, pp. 297–309.

Smith, M. A. (2003) 'Measures and maps of Usenet', in *From Usenet to CoWebs: Interacting with Social Information Spaces*, eds C. Lueg & D. Fisher, Springer, Berlin, pp. 47–78.

Stone, B. (2007) 'In web uproar, antipiracy code spreads wildly', *The New York Times*, 3 May, [online] Available at: http://www.nytimes.com/2007/05/03/technology/03code.html (31 October 2008).

Stromer-Galley, J. (2002) 'New voices in the public sphere: a comparative analysis of interpersonal and online political talk', *Javnost – The Public*, vol. 9, no. 2, pp. 23–42.

Sunstein, C. R. (2002) *Republic.com*, Princeton University Press, Princeton.

Sunstein, C. R. (2006) *Infotopia*, Oxford University Press, Oxford.

Wittaker, S., Terveen, L., Hill, W. & Cherny, L. (ed.) (1998) 'The dynamics of mass interaction', in *Proceedings of the 1998 ACM Conference on Computer Supported Cooperative Work*, ACM, Seattle, pp. 257–264.

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**Alexander Halavais** is an assistant professor at Quinnipiac University, where he teaches in the graduate programs in Interactive Communication. His research explores the role of computing in social change, particularly in politics and education. He has recently published a book entitled *Search Engine Society*. *Address*: Quinnipiac University, Interactive Communication, 275 Mount Carmel Ave., Hamden, 06518, USA. [Email: alex@halavais.net]

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