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Slashdot, open news and informed media: exploring the intersection of imagined futures and web publishing technology

Michael Stevenson

What should be made of the seemingly endless supply of *envisioned disruptions* of mass media by the World Wide Web, from mid-1990s notions of virtual community to more recent proclamations of a "bottom-up takeover" of news production and distribution?[1] One move in new media criticism is to expose the disparity between the various promises attached to new technologies and the actual forms and uses that characterize them. In perhaps its strongest and most popular rendition, Evgeny Morozov's 2010 book *The Net Delusion*, this is a call to expunge any "starry-eyed" futurism and technology-centered explanatory frameworks from discussions of new media and their effects.[2] On a similar note, Richard Barbrook argues that the "imaginary futures" that attend the public adoption of new technologies serve to distract from the economic and political interests these technologies in fact serve.[3] Where Morozov and Barbrook formulate the effects of such visions as obfuscation or false consciousness, a case can also be made for considering their productive capacities: the call to abandon the ideological and utopian tendencies of technology discourse, Patrice Flichy argues, ignores how these are inseparable from technological development.[4] Following Gabrielle Hecht, one may also emphasize how "rupture-talk" surrounding a new technology is constituted materially - that is, inscribed in new cultural forms and social practices - sometimes in ways that paradoxically act as a source of continuity.[5] Methodologically, Hecht's approach differs from that of Morozov and Barbrook in how she "call[s] attention not simply to a *disjunction* between real and imagined technological futures […] but also to the *relationship* between these futures," highlighting how concepts, narratives

and other forms of "mere rhetoric" become entangled in the establishment of novel socio-technical practice.[6]

In this essay, my interest is in how imagined media futures are implicated in the work of producing novel web publishing technology. I explore the issue through an account of the emergence of Slashdot, the tech news and discussion site that by 1999 had implemented a number of recommendation features now associated with social media and web 2.0 platforms. Specifically, I aim to understand the connection between the development of Slashdot's influential content-management system (CMS) - an elaborate publishing infrastructure called "Slash" that allowed editors to choose reader submissions for publication and automatically distributed the work of moderating the comments sections among trusted users - and two distinct visions of a web-enabled transformation of media production.

The first vision was open news, an analogy that suggested the application of principles of open-source software development to media, resulting in a decentralized, self-organized process involving a range of volunteer news-gatherers, editors and commentators.[7] The open-source news label was applied to Slashdot as early as 1999, though the similarities had already been noted by the site's founder and chief editor/engineer Rob Malda the year earlier.[8] The label suggested that Slashdot offered an open, bottom-up alternative to traditional news organizations, much like Eric Raymond's 1997 distinction between the "bazaar" model of decentralized production that marked open-source projects like Linux and the top-down, "cathedral" form of organization that characterized most software development.[9]

The second vision may be termed informed media and deals with the imagined future of unprecedented automation and transparency in the production, distribution and consumption of media.[10] Informed media architecture allows not only for the (semi-)automated execution and recording of tasks, such as pooling content for publication or ranking sources of information based on levels of trust, but also generates new insight into these processes; in its grandest form, it means a comprehensive overview of the tangible and intangible information flows that constitute the media

environment. Where popular and academic accounts have generally portrayed Slashdot as an important milestone in a lineage of peer production that extends to later phenomena like blogging platforms and collaborative media, my argument is that the history of the site's development sooner suggests the centrality of a vision of informated media.

On the one hand, it is easy to see how Slashdot was interpreted as an application of open-source principles. Malda, the site's founder, chief editor and developer, was a computer science student who created Slashdot in order to share news about open-source software with fellow Linux enthusiasts. Together with a few friends and collaborators, he would select and publish articles submitted by readers, an ad-hoc process that resembled developers volunteering their time for an open-source software project. After an article was published, comments supplied additional information, and the "rapid peer-review" of the filtering system aimed to ensure the best comments would be highlighted.[11] Openness, in this sense, meant giving the audience a say in what is published: to this day, Slashdot editors rely on users to direct their attention to news and select from a pool of reader-submitted stories. Often, users submit the same link or article, and editors choose the submission with the best summary or most background information. During its rise to prominence in 1998 and 1999, readers also provided many of Slashdot's editorials, most of which dealt with debates within the open-source community. Ideally, openness also means enriching a story through commentary and interaction after publication, extending the event of publication to include further fact-checking, analysis and other discussion. Analogous to what Raymond called Linus' Law, after Linux founder Linus Torvalds, the "many eyes" that made up Slashdot's audience would make it trivial to reveal any "bugs," or flaws in the reporting of a story.[12] A similar interpretation can be found in Axel Bruns's theorization of Slashdot as "gatewatching," or the act of contextualizing news by a community of interest.[13] Slashdot's infrastructure, Bruns argues, represented a turn to "highly elaborate systems for user participation and content control" and an important stage in a larger evolution toward a fully "open" form of publishing: one without any intervention by editors.[14]

In the genealogy of Slashdot's publishing infrastructure presented here, however, I depart from the notions of open news and gatewatching in a number of ways. First, even though Slashdot was closely tied to open source technology and advocacy, I show that this alignment only partially captures its specificity as a new media publishing culture. This must instead be seen in the context of Malda's immersion in BBS culture as well as the dynamics of the free software movement in the mid- to late-1990s, when open source projects began to compete with proprietary vendors and generate interest from dot.com investors. Second, relying on archival materials and supplemented by an interview with Malda in 2011, I reconstruct key moments in the development of Slashdot's most celebrated features, which included the moderation system and, later, its tagging system, and argue that the evolving logic behind them was different from the perception of Slashdot 'hacking' news media open or deploying the "secret weapon [of] the collaborative power of the Web," as Lev Grossman would suggest in 2000.[15] Rather, this proceeded in an ad-hoc fashion, with features often designed in response to more mundane problems like spam and then repurposed for analysis and various forms of automation. Finally, I argue that while Slashdot's production implied a larger vision of the web's disruption of media production, it was not that of open news, or in any other way opposed to traditional publishing practices. Rather, the vision was of a fully informed media product, in which the events, activities and processes of media production, distribution and consumption become traceable and transparent.

Historicizing "News for Nerds"

Rob Malda and Jeff Bates registered slashdot.org in September 1997, linking to Linux and free software news and discussing it with friends in a comments section attached to each page. Within two years, Slashdot's audience numbered in the hundreds of thousands, and *Wired* called it a new form of community journalism.[16] *Time* would follow suit, with Lev Grossman explaining that where Malda had sought a place on the web to chat with fellow geeks, he had built a collaborative form of news

production: "Malda has taken idea of what news was, hacked it open and rebuilt it for the Internet age."[17] Slashdot also found financial success: Malda and co-founder Jeff Bates sold Slashdot to Andover, a media company focused on technology and the open source movement, for $7 million in cash and stock options. The value of that stock grew exponentially with Andover's successful IPO later that year and again when Andover was acquired by VA Linux in 2000. (In another development typical of the dot.com bubble, those employee stock options had devalued substantially by the time they could be exercised/sold.) Although it is tempting to see in this short timeline a classic rags-to-riches story of technological discovery, there were a series of cultural and historical factors that led to Slashdot's emergence, from existing practices in online culture to larger shifts in web development.

Slashdot's mix of tech news and geek culture, as well as the centrality of the "forums" attached to each article, may be seen as an extension of Rob Malda's immersion in BBSs in the 1980s. Malda's childhood and teenage years coincided with a period of rapid growth in personal computing and computer networking: by the age of 13, Malda was logging on to a handful of local BBSs, and by high school he ran his own. It is relatively easy to see how this experience helped shape the type of website Slashdot would become. BBS users would share files and play "door games," such as Trade Wars 2000, while using message boards to discuss a range of geek cultural topics - from new software releases to TV shows like X-Files and Mystery Science Theater 3000. The roles BBS hosts took on similarly foreshadowed the kind of work Malda would do for Slashdot. Hosts, for example, had to strike a balance between determining the character of a BBS (from giving it a name to deciding which features and games to support) and acting as a facilitator. The bulk of a host's time therefore would be spent maintaining hardware, fixing bugs and (less frequently) policing the community.[18]

Subtitled "News for Nerds on the Stuff that Matters," Slashdot's primary topics of interest were Linux and other open source software projects, especially news related to their mainstream success. If facilitating technology discussion had been a legacy of BBS culture, the character of Slashdot's coverage, and the level of interest it attracted, had more to do with the emergence of a pragmatic,

business-friendly strand of free software advocacy at the height of the dot.com bubble. The site celebrated open-source development at a time when economic interest and media attention spiked, and acted as a forum for the exchange of ideas related to its commercialization. In January 1998, Rob Malda wrote a Slashdot editorial ("the first of hopefully many") called "Simple Solutions," in which he outlined why Netscape should release the source code for its Navigator browser under a General Public License (GPL). He argued it would be a good move for both the company and the free software movement.

> Netscape is losing money as well as browser market share. What's a company to do? Maybe the solution is simple: GPL Netscape's Source Code [...] Why would the Free Software World want to take on this project? GPL means we would have a state of the art free browser.[19]

For the first time, Malda saw streams rather than handfuls of hits on Slashdot. The solution was provocative and in fact one Netscape had already decided on. On January 22nd, the company announced plans to release their source code with the next version of their Communicator web suite: "This aggressive move will enable Netscape to harness the creative power of thousands of programmers on the Internet by incorporating their best enhancements into future versions of Netscape's software."[20]

What was notably missing from Netscape's announcement, however, was the term "free software." In the next few weeks, Eric Raymond attended meetings with Netscape's board and other industry executives interested in applying the bazaar model, and emerged with a "call to the community" to use the term "open source," which he argued would be clearer and less adversarial toward mainstream computer companies, without changing the basic meaning.[21] Driving the point home, the next day Raymond published revision 1.29 of "The Cathedral and the Bazaar," in which he simply replaced instances of free software with the new term. As Richard Stallman and many other proponents of free software were critical of the move, the new term solidified what had already become

an important debate within the community. The latent flame war in Raymond's proposal (entitled "Goodbye, 'free software'; Hello, 'open source.'") was manifest on Slashdot, where heated discussions made up a large part of Slashdot's early user activity. Slashdot provided a more centralized forum than the various Linux or free software conferences, mailing lists and IRC channels previously had, as well as being a publisher that was more or less committed to presenting differing views within the community. From 1998-1999, Malda regularly published editorial essays by readers that debated issues of commercialization and the extent to which open-source was a moral principle (as Stallman argued) or simply a more effective form of software development (as Raymond contended). These included essays on why the community should be more open to the "suits" and warnings that commercialization would destroy the elements of free software that had made it effective (and its advocates passionate) in the first place.[22] Although Malda was careful never to state Slashdot's position, on occasion he let on that pragmatism had his personal preference, for instance when he openly worried that Slashdot's passionate advocacy would marginalize the movement and hurt the goal of making Linux what he called a "Mainstream Alternative."[23]

Slashdot's success brought with it the problems associated with a large-scale operation. One of these was the hundreds of emails Malda received each week - and before long, each day - with news links. More noticeable for readers, there were a number of issues affecting the quality of discussion in the comments section: flame wars between users were one thing, but worse were scripts or bots created to 'crapflood' the forum, at times for spam but more often for automated flames and trolling. In fact, a few days before he posted "Simple Solutions," Malda wrote a plea to readers that they not abuse the "User Talk Back" feature; this would be the first of many similar requests, each delivered with a mix of urgency ("I want to appeal to Slashdot User's sense of decency") and self-deprecation (the byline read "from the climbing-on-the-soapbox dept."). The problem, Malda said, was one of a declining "signal to noise ratio":

Please play fairly kids. I like reading the comments- most of the time reading you guys comments [sic] really makes my work seem worthwhile, but when I see **crap** posted I feel like I have no choice but to just remove that feature from the site. Don't make me do that guys- think before you post.[24]

At the time, the comments section was a simple, chronological list attached to each article, with a form for entering new comments at the bottom of the page. Since there was no registration or use of browser cookies, commenters would fill in their information each time they posted, and there was no way to prevent users from posting as, say, "Rob Malda" or any other target of abuse. On the back end, comments were not entered into a database but automatically converted to HTML and attached to the end of the article's text file. There was no way to establish a connection between comments in order to delete multiple comments by a single user, or to see which posts a user had commented on. Malda would only moderate comments sparingly, and doing so meant manually removing them from a text file.

As Slashdot continued to grow in early 1998, a more pressing concern than abuse of the comments section was the ability to keep up with increasing traffic loads. In April, this led to Malda rewriting the software that organized the site's content from scratch. Among the improvements were a web-based system for managing user submissions and "an actual honest to god SQL database" to replace the slow system of flat text files.[25] With the new setup, Slashdot became an early example of the software stack now commonly known as LAMP (Linux, Apache, MySQL and php, Perl or Python), a fact that is significant for how it points to larger shifts in web publishing at the time. First, Perl and MySQL not only represented open-source alternatives to existing programming languages and applications but also were specifically designed for easier use and were thus more suited to a growing share of casual or non-professional web development.[26] Second, whereas web pages were often 'hand-coded' and manually organized in a file system, the combination of MySQL and Perl allowed for a CMS that automated much of this work. Third, the CMS was well-suited to the kinds of operations

necessary for managing user interaction: for example, by using regular expressions in Perl, one could quickly and easily identify and manipulate highly-specific strings of data and perform, for instance, a series of actions to format a user's submission or comment as html. What Slashdot represented, in other words, was perhaps the transition to "Web 1.5," a period of web development marked by expanded use of databases in content management and site interactivity.[27] The new CMS, dubbed "Slash" ("Slashdot Like Automated Storytelling Homepage"), made the site faster but also provided the infrastructure for many of the innovative features that would be added later.

When open means engineered

In the summer of 1999, few web publications were generating as much buzz as Slashdot, and in June, Malda and Bates sold the site to Andover. Along with the announcement that same month that the Linux distribution Red Hat would go public, Slashdot's acquisition was interpreted by industry press as proof of open-source software's transformation "from a serious hobby to a serious business proposition."[28] Slashdot, as a publication *about* open-source development, was primarily an indirect beneficiary of the hype around open-source's profitability - if open-source software companies became the industry giants that many hoped they would become, then a publication that catered to open-source developers was a valuable commodity. However, the excitement around Slashdot also concerned *how* it produced news. James Glave of Wired News was the first to argue that Slashdot was "open-source journalism" and thus a threat to traditional, closed modes of production.[29] If you are a tech journalist, Glave observed, Slashdot "may eventually make your job obsolete" because it "gets the scoop faster than you can -- along with about 600,000 news-hungry eyeballs a day."[30] The key difference from traditional publishing modes was the 'many eyeballs' that submitted stories and comments:

> [Slashdot] relies on the eyes and ears of the thousands of its readers to create what amounts to a collaborative newswire [...] The conversation that follows is part expert commentary, part peer

review, and part cocktail-party banter, as credible sources and experts weigh in alongside crackpots

in a rapid peer-review process.[31]

The resonances between Slashdot's mode of production and open-source projects had not been lost on

Malda. After hearing Eric Raymond deliver his paper "Homesteading the Noosphere" at the 1998

Linux Expo, Malda wrote that "[i]n a lot of ways, Slashdot is an application of the same princibles [sic]

that make open source work, but shifted over to the news stuff."[32] Raymond's piece elaborated on one

of the central arguments in "The Cathedral and the Bazaar": that participation in open source

development was motivated by self-interest rather than altruism and that, despite the free licenses,

'ownership' (in an informal, non-legal sense) actually played a significant role.[33] Malda reasoned that

Slashdot readers, like Linux developers, were willing to devote time and energy to improving a news

discussion forum that they had no financial interest in if it compensated them in other ways - most

significantly, by earning them credit for their work and respect from their peers.[34]

As much as open-source development provides a useful frame with which to understand

Slashdot's innovations, the site's history offers little reason to see the latter as an extension of the

former. It is worth noting, for example, that Malda's use of the analogy of open-source was an aside in

a longer conference summary, and references to something like "open news" were far and few between

on Slashdot itself.[35] Moreover, a closer examination of the logic guiding Slashdot's development from

early 1998 to mid-1999 - the period in which the site's automated moderation system and other

celebrated features were implemented - reveals an ad-hoc approach in responding to various issues

related to the management of the site and not the implicit critique of existing news production practices

that underlies the concept of open news. Malda created the web-based submissions box, for example,

simply to separate link suggestions from his regular email, and it was only afterward that he realized

this enabled him to create separate accounts and share the work of reading and selecting stories among

his friends.[36] Another affordance was the ability to automatically format submissions in HTML tables.

At first this was rudimentary - there were columns for submitter, date, section and the text itself - but

11

even sorting by section made the process of browsing and selecting content much more efficient. The innovation was that submissions were now data objects rather than flat text.

User registration was implemented in the summer of 1998, "largely in response to spam" and "the occasional DDoS [Distributed Denial of Service] and crapflood of our forums."[37] Here, too, was a straightforward answer to a well-defined problem that made new exploits possible. For many regular commenters, registration and the use of browser cookies meant they wouldn't have to fill in their information each time, but with a few tweaks by Malda, it also meant that they could set preferences for sections and topics, how comments were displayed, page size, and so on. Other customization features would follow, including "slash boxes," which imported headlines from other sites using Netscape's RDF site summary (later RSS).

Persistent identity also meant user activity could be registered and tracked (and a number of Slashdot readers opposed the feature for this reason). This was what would eventually make Slashdot's elaborate moderation system possible. Unreliable, 'weak' data such as IP addresses (and user names generated "on the fly" each time a user posted a comment) had largely been replaced by unique, numbered User IDs, and tables could be drawn up with various columns for log-in statistics and number of comments posted, time zone and other customization preferences, and so on. In September 1998, after going over possible solutions to various abuses of the comments system - from disallowing anonymous comments to employing elaborate perl scripts to try to intercept or weed out spam and other abuses - Malda wrote a system for awarding points to comments and invited 25 regular contributors to do the moderating. Moderators would receive a set number of 'credits' and could spend these by either adding a point to a comment they thought was high quality or subtracting one from a comment that was abusive, or they could also choose to do neither. Comments from logged-in users would start with a score of 1 and those from anonymous posters with 0. The score would then be updated with each moderation, and readers could set a "threshold" for viewing comments. The default setting was to hide comments with a score of -1 or lower.

At the time, for no apparent purpose, Malda also wrote code that updated each user's entry in the user database with a total score for their comments - what would become the basis for Slashdot's reputation system. In March 1999, after the activity of the original 25 moderators waned and the average number of comments rose, Malda used these total scores to invite another 400 users to moderate. The cumulative comments score, in other words, had become a user attribute, standing more or less in for the user's reputation on Slashdot. In a post about the changes, Malda called this total score a user's "alignment," a reference to the BBS role-playing game Trade Wars 2000.[38] The name would later be changed to "karma." Over time, moderation would undergo a number of changes, each one adding to the complexity of the system's back-end, generating new user attributes and applying existing ones in new contexts. A 'jury duty' model was introduced to automatically select eligible users to serve as moderators for a few days at a time. To select jurors Malda came up with metrics that he thought would constitute the average Slashdot commenter. This model of average use included karma scores (which would have to be within a certain range) and various activity measures, such as article views and number of comments.

At this point, the system had become somewhat dislodged from the original, basic aim of hiding abusive comments. Malda wrote a "Moderation FAQ," reformulating the goals as follows:

1. Promote Quality, Discourage Crap

2. Make Slashdot as readable as possible for as many people as possible.

3. Do not require a huge amount of time from any single moderator.

4. Do not allow a single moderator a 'reign of terror.'[39]

The moderation system and similar online reputation systems have sometimes been described as methods for "scaling up" conversation, but clearly this was not a transparent intermediary.[40] Instead it helped shape interaction, and its highest priority was to bring the best comments to the fore (and given

the many enthusiastic responses on the Slashdot forums in the subsequent weeks, this and its other goals appeared to have largely succeeded).

The engineering metaphor used to describe the problem facing the forums originally was increasingly that of "noise"; with the system's abstract character - the intuitive nature of its aims - and the continuous tweaks and alterations meant to test out different effects, the solution now no longer resembled moderation so much as another engineering concept: modulation.[41] Looking to improve the quality of the pool of moderators? Change karma to take other factors into account, for example whether users had previously had stories selected by the editors for publication. Are moderators spending too many points on comments that already have extreme scores? Try normalizing the scores, so that users only see a scale of -1 to 5.[42] Some changes were more involved, for instance the introduction of meta-moderation in September 1999, with which eligible users judged whether moderations of comments were fair or unfair. This would in turn bring along new considerations and require adjustments over time, for example to ignore a user's metamoderation when she or he skewed too far in one direction (judging everything as unfair, for example). Others allowed for more detailed analysis: Malda introduced moderation labels (positive ones such as "informative" and "funny" and negative ones such as "spam" and "flamebait") so that moderators would have to explain their actions and, ideally by doing so, would give more thought to what comments were truly worth rating up or down. In turn, the addition of labels made it possible for Malda to build in the editorial decision not to count "funny" comments toward a user's karma. The thinking here being that, while humor should be encouraged to an extent ("funny" comments were displayed at higher thresholds), "interesting" and "informative" comments were ultimately more valuable and should be rewarded accordingly.

New features, sometimes added in response to innovations elsewhere, generally folded back into the functions and aims of the core feature set of story submissions, karma and moderation. So, for example, when Slashdot followed LiveJournal and made it possible for users to post stories to their own page (where their comments were displayed, along with the proto-social networking feature of

'friends' and 'foes'), these were later tied into the submission system: users could add "section" and "topic" labels, and send their posts to editors to be considered for publication on the home page. Perhaps the most interesting addition in this respect came in 2006, when Slashdot implemented tags. At the time, a number of commenters pointed out that the new feature borrowed heavily from the social bookmarking site del.icio.us, created in 2003. What the commenters missed, however, was the extent to which tagging was integrated into the existing feature set, and how it departed drastically from most "folksonomic" classification schemes.[43] For one, tags were created to replace topics in the Slashdot categorization scheme, and thus take over some of the work of editors. Users would tag URLs in a shared database, and these would help editors evaluate it when sent in as a story submission. To this end, there were a range of tags that were Slashdot-specific: stories could be tagged with "dupe" (duplicate) if they'd appeared on the site before, while "nod" and "nix" were indicators of whether users thought a link deserved publication. More importantly, tags could only be added by users who are logged-in, though not every user's tags carried equal weight. Each user who tagged was given a distance measure based on how closely his or her tags matched or predicted those of Malda and the editors, and this was used to weight the value of his or her tags. The system was an intricate construction, a kind of "pyramid scheme" in which Malda sat at the top, followed by editors and then users whose decisions most often mirrored those of the staff.[44]

In short, the elaborate system - the tag database, but more generally the range of interconnected features that had accumulated over the years - had as its goal the efficient classification and distribution of news and news commentary, and this trumped the creation of opportunities for participation (even if the two things sometimes went hand-in-hand). The aim was for quality - as much as this may have meant "what Rob likes" - to rise to the top.[45] In some sense this was achieved by distributing the workload among the community, but for 'open news' to be at all possible, its production, distribution and consumption first had to be articulated as an information system: submissions, published stories,

users and various actions and histories were expressed in a relational database, as data objects with defined attributes and associated metadata.

Informating media at Slashdot and beyond

If Slashdot's history reveals flaws in the perception of it as "open news," to what extent were its innovations tied to a vision of transformation in the media landscape? On the one hand, Malda never set out to create an alternative to the gatekeeping functions of traditional publishers and editors, and he tended to ignore or downplay claims that Slashdot represented such an alternative. At most, for him, this was a matter of doing the work of traditional editors and others involved in news production in a more efficient way. In this way, something like the comments recommendation system was seen less as a critical or subversive act and more something akin to, say, customizing server software used to increase load capacity. The purpose was overall efficiency and a better news product. Malda himself rarely gave another impression, tending to dismiss the rupture-talk around Slashdot and open news as fluff. When Dan Gillmor wrote in May 1999 that Slashdot "makes us think about journalism's inevitable evolution as the Web takes hold," Malda called it "a nice little 'Slashdot as a weblog' piece apparently designed to stroke my ego."[46]

On the other hand, however, there were a few notable exceptions to this aversion to rupture-talk, which illustrate how another vision of the web's displacement of prior media forms played an important role in Malda's work and how he interpreted what he was building. In July 1999, Malda published an essay by reader Matthew Priestly in which he analyzed how Slashdot and the conservative forum Free Republic use technology to address the general "malaise of distrust among media consumers."[47] Using concepts from cryptology and graph theory, Priestly contrasted the structure of "trust decisions" in traditional news - where information flows are ultimately governed by the "descended tree" of trust, with corporate news agencies, commercial interests and powerful sources at

the top - to a hypothetical "distributed trust model, [in which] each consumer inhabits a single node in a formless but highly connected graph. Central authority is weak, participants are anonymous, and all nodes perform small amounts of voluntary labor."[48] As the first "community information filters," Priestly argued that Slashdot and Free Republic could be the first steps in a larger shift toward the wholesale redistribution of information flows to fit the needs of consumers, and away from those of media conglomerates, advertisers and other dominant interests. Such redistribution would bring about what Priestly called in the title of his essay, "Honest News in the Slashdot Decade." Interestingly, the word "honest" was removed when Malda posted it. This may have been accidental, but it was clear in Malda's short introduction to the piece that his interest was less in Priestly's criticism of mainstream media and more in his use of technological concepts to make sense of underlying processes in the distribution and consumption of information. Priestly's article was excellent, Malda wrote, because it analyzed "how The [sic] internet is changing the way that news moves about, and discusses problems and advantages related to it."[49] Priestly treated the 'movement' of news as a formalizable, quantifiable set of interactions, something that Malda must have appreciated given his own efforts at the time to analyze and make use of registrational data.

One of the only examples of rupture-talk from Malda himself came when he implemented a key element of Slashdot's comment recommendation system. After explaining with some pride his 'hack' for automatically selecting moderators, Malda wrote:

> Where is this heading? Think of a news site like Slashdot without a guy like **me**, or a group of guys at the center. One where the best **comments** become the articles on the homepage. If we could make that work... wow.[50]

Where Malda privileged the visibility of information flows over media criticism in Priestly's analysis, his comments here (given the context of his pride in automating a potentially tedious task) seem concerned not so much with a democratization of the news but rather with automation and

technological achievement. Although this is no less a vision of disruptive innovation than open news, this rupture-talk had more to do with the affordances for visibility and automation than it did with an opposition to existing editorial practices or institutions.

To put the importance of this distinction into perspective, I would like to suggest that Slashdot's significance should be seen less in terms of its creation of a general infrastructure for participatory news aggregation and commentary, and more in terms of how it helped institute the perception - much more widespread and established now than in 1998 - that the web makes social and cultural phenomena quantifiable and visible, in particular the information flows that (in this view) are the essence of the production, distribution and consumption of media. However ad-hoc Malda's innovations were, what they had in common was an awareness that registrational data could be harvested in a way that made previously hidden or indeterminate phenomena visible, including: user types, reputation within the community and the quality and character of commentary. In this way, Malda's actions perhaps foreshadowed Tim O'Reilly and John Batelle's insight, ten years later, that a "key competency of the Web 2.0 era is discovering implied metadata, and then building a database to capture that metadata and/or foster an ecosystem around it."[51] Although the competence described by O'Reilly and Batelle appears succinctly to describe Slashdot's innovations in web publishing, what this genealogy has shown is that their phrasing - "discovering implied metadata" - does not do justice to the complexity and creativity involved. On the one hand, it is true that formalizing straightforward relationships was an important piece of the puzzle. For example, when Malda realized that author names should be included in article metadata, it allowed users a further means to customize Slashdot according to their preferences. However, things quickly become more complicated when one considers the kinds of reputation measures that Malda employed for moderation and tagging. Constructs such as "karma" and the "average user" comprised a range of variables, incorporating attributes from duration of membership and page views to accepted story submissions and moderator activity.[52] The exact mixes, though, would often be adjusted based on results, new inputs and other factors. This was not a matter of

discovering implied relationships, then, but of continually tweaking a data model until a desired overall effect had been reached. With the tagging system, Malda similarly hoped the collaborative effort and weighted measurements would lead to the automatic grouping of related stories, whether this meant categories like political leaning or collections of different stories related to the same news event.[53]

Whether conceived of as a process of discovery or ad-hoc construction, the larger goal of Malda's work might best be described as "informating" media. This term was introduced by Shoshana Zuboff to describe the effect of information technology on the workplace: in addition to automating tasks previously carried out by humans, information technologies also register actions, producing data that can then be used elsewhere. In one example she gives, the bar-code scanner automates the checkout at the grocery store, but it also produces data useful for a variety of logistical and marketing tasks.[54] Many of the key Slashdot features were similarly made possible through the automation or improvement of other tasks. User accounts, for instance, were introduced to help combat spam, but the unique identifiers resulting from this could also be repurposed for analytical work. Zuboff notes that another profound effect of informated work is that it affords an expansive, over-arching vision of the events and processes that it comprises. Informating the workplace meant creating an "electronic text" that made the totality of an organization's activity visible in ways that were previously not possible:

> In the mills, the data interface provided a view, not only of one piece of equipment but also of the processes in an entire production module; not only of one module but also of the production process across the mill; and not only of the production process across the mill; and not only of the production process but also of management information, expert models with which to calculate optimization parameters, and other data related to personnel, markets, sales, and much more. Thus, access to the electronic text meant access to far more than discrete memos or reports could ever provide: the organization's work is made visible in a new way.[55]

At Slashdot, one likewise had both a micro-view of individual user actions and a macro-view of site-wide patterns. When I asked Malda in 2011 how running Slashdot affected his ability to design

information systems, his response echoed the the "electronic text" and over-arching vision described by Zuboff:

> [M]y position at Slashdot uniquely qualifies me for understanding how information moves through the internet. There's lots of things that people just don't understand, or don't really quantify, that I just sort of experienced. How reputation works, how individuals are motivated, how people rank and trust different bits of information, different sources of information. There's tons of really interesting and subtle stuff. But also things like how media replicates. If somebody says something in one place and six months later it reappears somewhere else […] all of those things go through the same sort of lifespan. Like the wacky stories. Wacky stories tend to appear in August. Just general news media sorts of things. August is a great time for crap news because everybody goes on vacation, so there's nothing happening, and reporters are bored. And there you go, suddenly you've got the story about the world's biggest tomato or something, and it's front-page news of the New York Times.[56]

By informating media at Slashdot, it would appear that one not only gained a detailed view of the events and activities that comprised tech news and its audience but also glimpsed the larger set of information flows that constitute the media environment in a broader and more abstract sense.[57]

Malda's sense of overview - which arose from years of close contact with the engineering and editorial sides of running Slashdot - resonates strongly with a number of present-day commercial and academic projects that seek to use web data to extract the hidden patterns, structures and relationships of social and cultural life. These include efforts to measure attention through search data, as well to quantify "influence" through users' activity across social media.[58] Within the humanities and social sciences, such informated visibility is at the center of calls to innovate method and theory. For example, the University of Amsterdam's Digital Methods Initiative asks how claims about society and culture might be "grounded in the online" as the web is taken more seriously as a source of data.[59] The University of California at San Diego's Software Studies Initiative, meanwhile, asks how to "take advantage of unprecedented amounts of cultural data available on the web to begin analyzing culture in

new ways," and, furthermore, to author a "new cultural theory for the 21st century."[60] Perhaps the most famous example of the informed web and its promise, though, comes from web developers who advocate a unified social graph, described, most spectacularly, as "the global mapping of everybody and how they're related."[61]

Slashdot clearly belongs in this lineage of informed media, and adds to it a critical note about the constructed nature of the new kinds of visibility these media afford. What began as a response to an overflowing inbox and a declining "signal to noise ratio" in Slashdot's forums became an impressively articulated vision of traceable information flows and automated forms of aggregation, classification and recommendation. This process was guided not just by available technology or straightforward product design decisions, however, but also by Malda's intuition and his interpretations of available data. Malda's dream of revolutionary automation and fully legible information flows - along with so many of today's big data initiatives seeking to measure ambiguous qualities like reputation or formalize such nebulous phenomena as social relations - may be debunked for how it places too much faith in the powers of formalization and quantification.[62] At the same time, however, critics and historians must recognize that these imagined futures are hardly external to such initiatives, and must be accounted for when seeking to understand the cultural production of new media forms and technologies.

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[2] Evgeny Morozov, *The Net Delusion: The Dark Side of Internet Freedom* (New York, PublicAffairs),

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[3] Richard Barbrook, *Imaginary Futures: From Thinking Machines to the Global Village* (London: Pluto Press, 2007).

[4] Patrice Flichy, *The Internet Imaginaire* (Cambridge, MA: MIT Press, 2007).

[5] Gabrielle Hecht, "Rupture-talk in the Nuclear Age: Conjugating Colonial Power in Africa," *Social Studies of Science* 32 (5-6) (2002): 691–727. In her study of the role "nuclear-age rupture-talk" played in uranium-rich Madagascar and Gabon in the 1950s, Hecht shows how colonial power relations persisted *through* (rather than in spite of) the practices instituted in line with visions of a new, decolonized society that would profit from and be organized around technological expertise. See

[6] Hecht, "Rupture-talk," 692-693.

[7] James Glave, "Slashdot: All the News That Fits," *Wired*, August 26, 1999, http://www.wired.com/culture/lifestyle/news/1999/08/21448.

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[22] Philipp Koehn, "Feature:Who Is the Software Communist?" *Slashdot*, September 15, 1998, http://news.slashdot.org/story/98/09/15/1130201/featurewho-is-the-software-communist; Greg Perkins, "Feature:Open Source and Capitalism," *Slashdot*, August 8, 1998, http://news.slashdot.org/story/98/08/24/0854256/featureopen-source-and-capitalism.

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[29] Glave, "Slashdot."

[30] Glave, "Slashdot."

[31] Glave, "Slashdot."

[32] Rob Malda, "Rob's Return/LinuxExpo Wrap Up," *Slashdot*, May 31, 1998, http://news.slashdot.org/story/98/05/31/1650242/robs-returnlinuxexpo-wrap-up/. When I asked Malda to clarify what he meant by this relationship between Slashdot and open source principles in 2011, he characterized this as primarily a relationship between the ad-hoc style of open-source development (rapid-prototyping, evolutionary design, etc.) and his approach to writing Slashdot code (perhaps most infamously his practice of updating the site live). As I argue in the rest of this chapter, it would be a

stretch to understand the development of the moderation system or other features as conscious efforts to critically oppose traditional forms news production or distribution.

[33] Eric Raymond, "Homesteading the Noosphere," *Catb.org*, 1998, http://www.catb.org/~esr/writings/homesteading/homesteading/.

[34] Malda, "Rob's Return"; Raymond, "Homesteading."

[35] The Linux Expo summary was the only case in the period 1997 to1999 where a post by Malda explicitly mentioned the connection between open-source development and Slashdot's approach to news production.

[36] Interview with Rob Malda, Ann Arbor, 6 December 2011.

[37] Malda, 2007.

[38] Rob Malda, "Several Slashdot Notes," *Slashdot*, April 6, 1999, http://news.slashdot.org/story/99/04/06/2125239/several-slashdot-notes.

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[41] For example, see Malda's ("Several Slashdot Notes") discussion of tweaking the formula for creating user scores to identify potential moderators.

[42] Malda, "Several Slashdot Notes."

[43] Clay Shirky, "Ontology Is Overrated -- Categories, Links, and Tags," 2005, http://www.shirky.com/writings/ontology_overrated.html.

[44] Malda interview.

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[46] Dan Gillmor, "Slashdot Almost Addictive for Those Who Care," *SiliconValley.com*, May 24, 1999 http://web.archive.org/web/20000505084954/http://www.mercurycenter.com/svtech/columns/gillmor/docs/dg052599.htm; Rob Malda, "Dan Gillmor on Slashdot," May 25, 1999, http://news.slashdot.org/story/99/05/25/1316203/dan-gillmor-on-slashdot. Although Malda generally dismissed the idea that Slashdot was displacing existing media practices and institutions, the Slashdot community was more amenable to the idea. Many of the highly-rated comments attached to the "Dan Gillmor on Slashdot" story praised Slashdot as revolutionary news media.

[47] Matthew Priestly, "Honest News in the Slashdot Decade," *Slashdot*, July 16, 1999, http://slashdot.org/story/99/07/16/1316248/featurenews-in-the-slashdot-decade.

[48] Priestly, "Honest News."

[49] Priestly, "Honest News."

[50] Rob Malda, "Slashdot Moderation Phase 1.1," *Slashdot*, March 23, 1999, http://news.slashdot.org/story/99/03/23/1058204/slashdot-moderation-phase-11. Emphasis in original.

[51] Tim O'Reilly and John Battelle, "Web Squared: Web 2.0 Five Years On," *Web 2.0 Summit*, 2009, http://www.web2summit.com/web2009/public/schedule/detail/10194.

[52] For an overview of these variables, see Chromatic, Brian Aker, and Dave Krieger, *Running Weblogs With Slash* (Sebastopol: O'Reilly, 2002), 90-92.

[53] Malda interview.

[54] Shoshanna Zuboff, *Age of the Smart Machine*: 9.

[55] Shoshanna Zuboff, *Age of the Smart Machine*: 179.

[56] Malda interview.

[57] Malda's statement is a little ambiguous, in that he's speaking about knowledge (or visibility) gained through quantification and things he "just experienced." What's important to note, however, is that in

the intuitive process through which he developed the comments moderation system and other features, these two kinds of knowledge are not distinct but rather mutually constitutive.

[58] See for example Google Trends (http://www.google.com/trends/) and Klout (http://www.klout.com/).

[59] Richard Rogers, *Digital Methods* (Cambridge, MA: MIT Press, 2013), 4.

[60] Lev Manovich, "About." *Software Studies Initiative*, May 2007, http://lab.softwarestudies.com/2007/05/about-software-studies-ucsd.html.

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[62] See for example Florian Cramer's excellent critique of the reductionism and "complexity nightmare" inherent to projects like the Semantic Web. Florian Cramer, "Critique of the 'Semantic Web,'" *Nettime.org*, December 18, 2007, http://www.nettime.org/Lists-Archives/nettime-l-0712/msg00043.html.