FROM BLOGS TO OPEN NEWS:
Notes towards a Taxonomy of P2P Publications

Dr Axel Bruns
Media & Communication, Creative Industries Faculty,
Queensland University of Technology, Brisbane, Australia

Abstract

Peer-to-peer (p2p) communication is currently a major driver of online content development. In addition to some of the better-known p2p communication forms such as filesharing, however, we are now also witnessing the emergence of a wide range of p2p publishing *models. These range from solitary, diary-style Weblogs (blogs) to communal blogspaces which place individual blogs within elaborate interconnecting extrastructures, and beyond this to increasingly sophisticated Websites for the open publishing and discussion of special interest news. This form of communal publishing replaces traditional journalistic gatekeeping approaches with a new gate*watching *model, and (implicitly or explicitly) applies the philosophy of the open source software development movement to news reporting and publishing, leading to what can be described as* open news.

Typically emerging from existing interest communities, p2p publications frequently cater for topics which are absent from the mainstream media. Their basis in the community can lead to the publishing and discussion of news and information in a highly topical, well-informed fashion, which has also made such models highly attractive to online activist groups. Common to such sites is that the role of site owners and editors appears largely to be limited to maintenance interventions, rather than content-editorial screening and filtering. The selection and editing of content, on the other hand, is usually in the hands of site users themselves, often (as in the case of sites like Slashdot.org with its 500,000 registered users) through elaborate self-moderation systems. Compared to traditional news and commentary publications, therefore, new power structures can emerge which affect these publications in specific ways.

If in these sites we see the emergence of common models for designing communication for diverse communities, it is necessary to investigate whether these site models provide suitable vehicles for information exchange and communication for more than simply the usual techno-geek groups that are already overrepresented in Internet communication structures. This paper describes peer-to-peer publications as a continuum of publishing approaches ranging from isolated, single-writer blogs to widely recognised, large-community open publishing Websites; it notes commonalities and differences amongst these related models along the way. It makes reference to typical examples of p2p publishing sites and points out potential benefits and problems inherent in these publishing forms. Finally, it also considers the extent to which the open source philosophy provides a useful ideological model for these sites.

Introduction

Peer-to-peer (or p2p) interaction today is one of the key paradigms for computer-mediated communication, and is often positioned as an alternative to more traditional one-to-many broadcast models. Recently, it has gained a certain notoriety especially as the underlying model for filesharing technologies from Napster to Gnutella (see e.g. Rimmer 2001) – technologies which are used to bypass established commercial distribution models for music, software, and other content, and which enable their users to obtain a wide variety of proprietary material free of charge, if illegally. Napster in particular rapidly developed a significantly large user base, and subsequent legal actions against it by recording industry associations, while managing to close down the original Napster itself, have only led to the proliferation of a variety of alternative p2p filesharing services including the Australian-operated Kazaa.

Another form of p2p interaction can be found in the collaborative software development models of the open source software movement, where developers all over the world use support Websites such as SourceForge to contribute to joint software development projects. Such projects are owned and coordinated by the community, and have in many cases matured to a level rivalling proprietary products. The open-source Linux operating system and Apache server suite are today significant competitors for Microsoft's products, for example. In this case, too, the desire to develop an alternative to proprietary and commercial production and distribution models was a key driver for the adoption of p2p approaches.

In addition to such p2p development and distribution systems, we are also currently witnessing the emergence of a variety of p2p publication approaches on the World Wide Web. Once again, these operate with a clear aim to establish alternatives to commercial and proprietary information publishers on- as well as offline. Peer-to-peer publications, much like open source software, are developed through ongoing collaborative efforts involving more or less sizeable groups of contributors, while – much like filesharing systems – often building on repurposed information from commercial sources. Publications which can be classed under the p2p category range from individual Weblogs and Weblog communities to communally produced news and information Websites of various shapes, and have now evolved to a point where it has become necessary to begin the development of a taxonomy of p2p publications, in order to trace commonalities and distinctions amongst them.

To begin with, however, it is necessary to define what is meant by p2p publishing itself: as a working definition, we might say that, similar to the filesharers, **p2p Web publications are sites which facilitate the exchange of information and opinion amongst their users, generally with only minimal or no policing by the site operators** (or, where these operators participate themselves, they do so as users). This definition will account for a majority of p2p publication sites, even though some borderline cases exist where it does break down.

Clearly, this extends the use of the term 'peer-to-peer' beyond the narrow, technology-based definition that has been used in recent years. While it is true that many of the key examples for p2p have emerged out of decentralised, distributed networking technologies (examples include Usenet newsgroups or many filesharing applications), it is important to look beyond the technology itself to its social contexts,

to examine the uses made of it. Such a broader view returns to a more literal understanding of 'peer to peer' as the range of systems and practices enabling participants to interact amongst themselves on an equal footing and without significant intervention from editors, moderators, network administrators, or other controlling powers. It is interesting to note in this respect, too, that by a strong technological definition of p2p one of the key p2p examples typically cited – the Napster filesharing network – does not constitute 'true' peer-to-peer networking, because it did operate through central servers facilitating connections between participating peers (a factor which significantly contributed to its downfall; see e.g. Ward 2001). By contrast, only successor technologies like Gnutella or KaZaA do away with central network authorities altogether.

In other words, what is significant about peer-to-peer interaction is not necessarily the shape of the underlying network technologies, but the extent to which direct, uncontrolled user-to-user interaction (or end-to-end interaction, as Shirky puts it) is possible. "P2P represents a swing of the pendulum back toward user control" (Shirky 2001) – but as Napster has shown, this can happen on the back of centralised server technologies as well as through fully decentralised networks. P2p publishing does establish a system for distributed production, editing, and quality control of news items, while usually remaining on centralised servers.

Centralised servers are much more vulnerable to technological or legal challenges, however, and we will return to this issue later. Online publishing in general has traditionally operated through individual, central Web servers rather than distributed networks. In the absence of persistent attacks against servers, and provided that access to Websites remains reasonably fast and reliable regardless of server and user locations, distributed hosting of Web content has remained uncommon so far. Nonetheless, as we will see such centralised servers do allow for a considerable level of unpoliced direct participation and interaction by and amongst peers.

An Overview of Site Models

The following provides an overview of current models for p2p publication sites. Some of the terms used to describe them have already gained widespread currency, while others remain underutilised; it should also be pointed out that the categories introduced here do not establish mutually exclusive species of Websites, but rather constitute a continuum of variations on the peer-to-peer theme.

Sites included here can be classified according to five key characteristics –

1. opportunity for user contributions (ranging from totally closed sites to totally open sites to sites which allow users to contribute, but evaluate and edit such contributions);
2. role of content editors (from independent authors through to what will be described as 'produsers' of the site to independent editors);
3. typical audience (from individual readers to an interest community to a mass audience);
4. organisational setup (from decentralised sites to a network of publications to a centralised publication model).

5. direction of peer-to-peer exchange (from one-directional one-to-few through bidirectional many-to-many back to one-directional few-to-many communication)

Each of the site models discussed below will feature a specific combination of these characteristics.

Personal Blogs

Weblogs, or 'blogs', form a borderline case for p2p publications. Weblogs in themselves serve a variety of uses: in their most basic form, they constitute no more than a form of more or less regular public diarism by individual authors. In other words, in terms of the criteria outlined above, this form of blog is produced by individual authors who publish their own thoughts exclusively, often for an only loosely defined audience of readers who may have happened upon the blog by accident. They can be described as peer-to-peer media to the extent that here 'average' Web users write about their daily experience for their peers, but generally there is no immediate intent to *exchange* information amongst peers – such basic blogs are largely one-directional publications of individual authors, who act as gatekeepers policing what is published in their blogs, writing for an imagined and highly diverse audience.

Many blogs have advanced beyond this very basic level, however, especially if they are hosted through Weblog facilitators such as Blogger.com or Livejournal. Such services often offer an option for readers to comment and discuss these issues with the blog author(s), and also enable individual blog authors to use the site's functions to interact with one another. (A well-known example for this form of Weblog would be cyberlaw campaigner Lawrence Lessig's blog; Lessig 2003.) In essence, therefore, the more elaborate of such sites provide a loose and *ad hoc* extra- or metastructure which ties together individual blogging efforts and facilitates true exchange both between blog authors as well as between authors and audiences. Employing the classificatory criteria again, we can identify such loosely networked blogging as somewhat open to user contributions, but clearly privileging the original blog author's content; such blogs are produced for a diverse group of individual readers and form a highly decentralised, impermanent network of sites. By and large, they continue to employ a one-directional one-to-few model, even if they enable some degree of response and interaction from users and fellow bloggers.

Further beyond this, then, some Weblog authors truly engage with one another's content contributions, and even participate in the joint publication of collaborative blogs such as *Stand Down*, an anti-Iraq war group blog (2003). Here, therefore, we see a departure from the individual diarism model towards a form of communal writing and editing, and the emergence of true, equitable peer-to-peer exchange amongst the blog authors (as well as with their users, even if in this case the authors' contributions remain more privileged). The content editors – the authors – involved in such blogs lose some of their gatekeeping function in this case simply because there is a wider variety of gatekeepers participating, and they are organised in a decentralised network. Importantly, too, the communal nature of such blogging efforts often requires common themes to be defined for the Weblog as such – as in the case of *Stand Down* –, which will in turn attract an audience that can be classed more

immediately as an interest group. In all, we might say that in the move towards this communal, collaborative form of blogging the views of individual blog authors begin to be overtaken in importance by the overall aims of the Weblogging effort itself.

Common to all forms of p2p publishing, but becoming especially prevalent towards this end of the blogging continuum, is that the content exchanged through such communal blogs often incorporates repurposed information from other sources on- or offline. Many blogging systems include functions for pointing towards or citing material from other Websites, and bloggers frequently make use of these functions to point their readers to issues of shared interest or to use this content as a starting-point for their own observations. Indeed, such content reconnaissance and republishing, such *publicising* of other sites' content, can become a primary function of blogs especially where bloggers cater for specific existing or imagined interest groups. There are some similarities between such efforts and the peer-to-peer filesharing and software piracy phenomena, in fact, where the so-called 'zero-day' scene consists of software pirates' groups whose primary goal is to be the first to offer the cracked version of a new software package or computer game through their Websites or filesharing networks (see McCandless 2001). In the case of p2p publishing, however, copyrights are generally not breached, as it is possible simply to post a link to new information as it exists on the original publisher's Website.

In analogy to the journalistic practice of gatekeeping, whereby journalists and editors police the gates of their publication to ensure that only suitable information is allowed through to be transferred to the audience, and where gatekeeping ideally selects 'all the news that's fit to print', according to the gatekeepers' intuition of what their audience is interested in (or at least 'all the news that's fit to print and that can be made to fit into the available space'), the content evaluation and publicising carried out by bloggers may be described usefully as *gatewatching*. Gatewatchers are unable to keep the gates through which news and information passes – and indeed, as we move away from a mass media 'information-push' news model to an individualised 'information-pull' approach, these gates no longer allow news to come to us, but enable us to access the news contained within (see e.g. Levinson 1999, pp. 119-131). Rather, then, gatewatchers keep a constant watch at the gates, and point out those gates to their readers which are most likely to open onto useful sources.

Collaborative Gatewatcher Sites

For blogs, gatewatching and news reporting remains mainly a by-product of their Weblogging efforts – overall, they are focussed on the peer-to-peer exchange of views more than of news. However, in the more topically focussed and collaborative communal sites the identification and publicising of relevant news, and a subsequent discussion of events as they occur, can become the prime raison d'être. Such sites cannot be classed as true Weblogs any more – rather, they are a form of news Website produced through communal gatewatching. Usually, such sites focus on a specific field of information in their endeavours, in keeping with overall trends on the Net which have seen the emergence of a multitude of often very topic-specific interest communities that are supported by mailing-lists, newsgroups, and Websites.

Such communal gatewatcher sites, then, employ an open approach which involves all of their users as potential contributors to the gatewatching process. This removes a

need for dedicated gatewatchers amongst the site's staff, who instead concentrate on supervising site operations. At the same time, however, such fully open models are clearly also opened to accidental misinformation or deliberate abuse; conversely, of course, sites which retain an editorial element would also retain a need for staff editors.

One of the most popular, almost fully 'open' gatewatcher sites is the ICT news site Slashdot.org, which by its own definition covers 'News for Nerds, and Stuff That Matters' and has managed to attract over 500,000 registered users since its launch in 1997. It serves "from zero to 1.2 million pages per day, with an average of 230k unique IPs per day" requesting content from the server (Bates 2001, email interview). It has largely managed to overcome the problems inherent in allowing users to contribute freely: Slashdot articles (as well as the responses readers are able to immediately attach to any posted article) are subject to an elaborate communal moderation system which enables random users to rate the quality of their peers' contributions. Based on such ratings, articles and comments are displayed more or less prominently, or even disappear from view if their rating falls below a threshold which can be set by each individual user as they adjust their personal preferences for the site.

This combination of user comments and ratings ensures that on average, the quality of Slashdot content is remarkably consistent. Poorly researched or written articles are soon moderated down or augmented by more insightful commentary; misinformation or other shortcomings in the primary news sources which Slashdot articles point to are also quickly addressed through the commentary attached to the articles, often also by supplying pointers to further news sources. Taken together with their commentary, Slashdot articles, in other words, provide a view of gatewatching in process, and underline the ephemeral, continuous nature of any news reporting process. Far from the closed-off published output of the traditional gatekeeping model, this form of gatewatching produces a much more open, discursive form of news-in-progress. In contrast to the sender-receiver setup of mainstream print or broadcast news, such gatewatching news media turn viewers into users, and even (co-) producers of news – a role which might be best described as that of a *produser*.

Slashdot's large userbase means that it can rely almost entirely on these gatewatching produsers as content contributors – as of 2001, it still had only "8 people working on it …, not including salesforce people and sysadmins", yet dealt with some 500 story submissions each day (Bates 2001, email interview). This high level of submissions, and the even more significant amount of commentary attached to posted stories, combine to produce a highly effective, up-to-date and in-depth coverage of issues which are of interest to Slashdot readers. Indeed, one of the side effects of Slashdot stories is that some Websites featured in new articles experience an immediate access overload as Slashdot readers follow the link to their address and the Websites' servers cannot keep up with demand – this has become known as 'getting slashdotted'.

Such news sites, then, employ a production ideology which is not unlike that of open source software development, and could therefore be called open news sites (also cf. Graham Meikle's work on the closely related concept of open publishing – his chief example is the Indymedia network of Websites, which also fits the description for gatewatcher sites used here; Meikle 2002, pp. 88-112). At least one site, Openflows

(also running on the Slash code), even makes this connection to the open source movement explicit, by referring to its activities as 'Open Source Intelligence (OSI)': "for us, OSI is the application of collaborative principles developed by the Open Source Software movement to the gathering and analysis of information. These principles include: peer review, reputation- rather than sanctions-based authority, the free sharing of products, and flexible levels of involvement and responsibility" (Stalder & Hirsh 2002).

Indeed, starting from generally accepted definitions of open source software it is not difficult to translate such principles to other forms of engagement with information. Opensource.org states that

> *the basic idea behind open source is very simple: When programmers can read, redistribute, and modify the source code for a piece of software, the Software evolves. People improve it, people adapt it, people fix bugs. And this can happen at a speed that, if one is used to the slow pace of conventional software development, seems astonishing.*
> *We in the open source community have learned that this rapid evolutionary process produces better software than the traditional closed model, in which only a very few programmers can see the source and everybody else must blindly use an opaque block of bits.*
> *(Opensource.org 2003)*

An equivalent statement of principles for open news could read:

> the basic idea behind open news is very simple: When news producers and users can read, redistribute, and modify the source information for a piece of news, the understanding of news evolves. People improve it, people adapt it, people fix bugs. And this can happen at a speed that, if one is used to the slow pace of conventional news reporting, seems astonishing.
> We in the open news community have learned that this rapid evolutionary process produces better news than the traditional closed news model, in which only a very few editors can see the source reports and everybody else must blindly use an opaque news story.

Peer-to-peer open news exchange systems, therefore, have moved beyond traditional approaches to news gathering and publishing, much like their open source counterparts have developed new models of software development. While in theory certainly not impossible in other media, the open news model is also particularly well suited to operating through Websites, able to take advantage of the Web's specific features as a media form. (Much like open source software development is significantly aided by key Websites such as Sourceforge.net.)

Returning to the five characteristics for peer-to-peer Websites, then, such open news sites are fully open to users as content contributors, and also employ them as editors, or produsers. They are typically focussing on specific news fields (as in the case of Slashdot), and therefore attract a specific interest group, which uses the site for a many-to-many exchange of information. Further, instead of a decentralised network of individual blogs these sites take a far more centralised organisational structure, in

spite of relying on a wide network of contributors and linking together a vast collection of news and resources.

As noted, Slashdot is not a totally open news site, however. Slashdot staff are involved as editors of the site's front page, which features the most important stories selected from everything that is published in its range of specific topical sections each day; fundamentally, however, stories submitted by users constitute "100% of our news gathering", according to its co-founder Jeff 'Hemos' Bates – and so it would be fair to say that in spite of having developed this form of gatewatching, Bates and the other Slashdot staff are now no longer themselves working as gatewatchers, but merely maintain the environment for their users to act as produsers of the site.

Other collaborative gatewatcher sites, however, utilise somewhat more stringent editorial policies, even to the point that they cannot be classed as truly open news sites any more. Some sites, for example, do not immediately publish user-submitted content, but rather employ dedicated editorial staff who verify stories before they go to print, or perform other traditional journalistic roles. Others allow news submission only from accredited contributors

One example for this now relatively closed collaborative approach to gatewatching is MediaChannel.org, a global media 'supersite' which combines reports on media-related issues from its network of over 1,000 affiliate alternative media outlets around the world. Indeed, MediaChannel's central motto is 'we watch the media' – for their impact, to provide additional information and alternative perspectives, and to inspire debate and action on media issues. As MC's Senior Editor Aliza Dichter puts it, "we are helping users connect to the most important and valuable media-issues content we find on the Web" (2001, email interview), and so this remains a form of gatewatching, yet moves away from peer-to-peer information exchange. MediaChannel's staff are gatewatchers primarily focussed on the gates of their affiliate outlets, but also take note of material published elsewhere where this is relevant. According to the MC FAQ, its "editorial staff selects relevant material to highlight on MediaChannel; links from these summaries provide direct access to the complete, original articles". In addition, "MediaChannel also publishes original news, reports and opinion from leading media professionals, journalists, scholars and critics" (2003, n.pag.). This demonstrates the close connections between this flavour of gatewatching and more traditional few-to-many journalistic approaches.

In the case of MediaChannel and similar organisations, then, we are approaching the opposite end of the p2p Web publishing continuum, furthest removed from Weblogs and their form of peer-to-peer publishing, and instead returning to more traditional one- or few-to-many information dissemination models. Here, we can see clear distinctions between publishers and audience emerge again; they are no longer peers interacting on equal terms. Beyond this closed collaborative model lie the Websites of the traditional news media, and in fact it is easily possible to imagine a traditional news Website's move to gatewatching by relaxing its policy of strict gatekeeping and instead posting more articles which publicise information available elsewhere, rather than provide a complete account of a news item on-site. Conversely, the closed collaborative gatewatcher sites could also turn to more traditional modes of news reporting by making the reverse move of editing their articles even more tightly and reducing the amount of links to primary news sources.

In all, then, the continuum of peer-to-peer Web publications can be seen to stretch from the more interactive approaches to Weblogging across the core of collaborative blogs and open news sites to the at least moderately open forms of gatewatching. On either end of this continuum lie related site models which do not, however, fall under the overall p2p category any more:

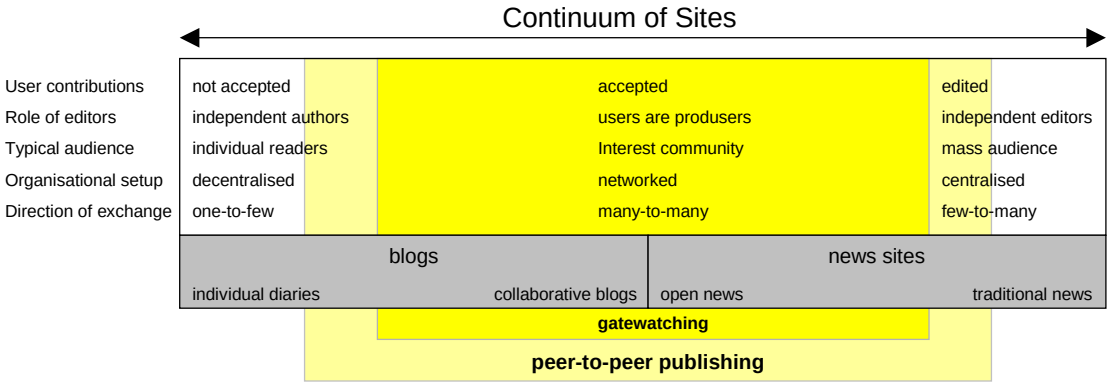

Figure 1: Continuum of Website models.

Questions for p2p Publishing

The preceding overview could only sketch in broad strokes the wide variety of p2p publications which exist on the Web. More detailed investigations, especially also involving close ethnographic study of both contributors to and users of specific sites in their engagement with information and users found on these sites, is highly necessary. Research such as Anita Chan's study of Slashdot (2002) or Jill Walker's ongoing engagement with the theory and practice of blogging (2003; itself in the form of a blog) will provide the first stepping stones towards a more systematic engagement with all the site models along the p2p publishing continuum. (Also see Bruns 2002).

Already, however, a number of key observations can be made. Where they are successful in their endeavours (attracting a sizeable and engaged audience), peer-to-peer publishing sites may command a tremendous influence on their audience: if users do come to rely on the news and views presented in such sites, then this must inevitably influence their process of knowledge- as well as opinion-formation, affecting both their long-term world-view and their short-term political views (with 'political' used here in its widest possible meaning).

Much like their gatekeeper and editor colleagues elsewhere, gatewatchers can thus become powerful opinion leaders and trend-setters. Perhaps in contrast to these other opinion leaders, however, gatewatchers appear less removed from their audience, by virtue of their appeal for the involvement of users as produsers, indeed *as gatewatchers*: if truly open p2p publications are showing any form of bias, they do so because their participating constituency is itself biased. More so than edited publications, then, whose coverage may be influenced by the editors' commercial or ideological agenda to the point of not being representative of popular views and

interests, gatewatcher sites are inherently 'of the people' – but they may be so both in the sense of serving the public interest *and* in the sense of taking a populist stance.

A different issue still to be resolved by p2p news is the question of the extent to which it is truly able to affect mainstream attitudes. In many ways, this is a problem shared with the open source movement: while the user base of sites like Slashdot with its 500,000 users, or the uptake of open source software for example for Webservers, appears impressive, both have yet to break out of the geek ghetto. Not enough mainstream users have been tempted to swap Microsoft Windows and other proprietary software packages in favour of, say, Linux, and similarly the readership of open news services pales in comparison with the audience for traditional mass news media. It remains to be seen whether open source or open news can close these gaps in the immediate future.

Further, contrary to open source, the open news movement still operates very much *ad hoc* and without clear intellectual property frameworks – eventually it may become necessary to develop an 'Open News Licence' in analogy to the 'Open Source Licence' to address IP issues. Where conflicts over the conduct of site owners arise, for example, they may highlight the fact that for all the involvement of users as produsers the site owners remain especially privileged members of the site community, by virtue of their control over the site's underlying technology. In the case of open source an entire project is available to its participants to develop further as they see fit – the structure of the project's contents (that is, of the source code) is inscribed into the contents themselves, and disputes over future directions often lead to a 'forking' of development into separate projects. For open news, this is not the case: the structure of open news contents (of the individual news items contained in a site's database) is determined externally, by the database and Website technology which supports it. Forking is less likely, therefore: a site like Slashdot, for example, could only be forked by first copying (cloning) the entire Website and database onto a different server and then developing it in a different direction. This could only be done by someone with access to the Slashdot server, however, not by one of its rank-and-file contributors. (Notably, however, the Slashdot source code – and that for similar site models, such as PHP-Nuke or Postnuke – is available as open source: while the databases of open news sites are not available for forking, their underlying technologies are.)

This returns us to an issue identified at the start of this paper: as long as p2p publishing sites remain technologically centralised, that is, hosted on specific servers in specific locations, they remain vulnerable to technological or legal challenges and do not embrace the structural aspects of peer-to-peer approaches as fully as do decentralised filesharing systems or open source software development practices. In other words, while there exists a peer-to-peer interaction model with regard to the content created and exchanged through such sites, it remains built on an underlying user-to-server connection model at a technological level.

Such questions should not be seen as undermining peer-to-peer publishing efforts altogether, though. The ready availability of Webware packages which support the creation of gatewatcher sites, and the obvious enthusiasm with which many Web users are becoming produsers contributing to their favourite sites, combine to ensure that in

many fields of interest we can now see the rapid emergence of p2p publications (and here especially of those following the open news model).

We are also beginning to see trends towards stronger interaction between individual p2p publications through headline syndication and content sharing. Many sites now offer standardised RSS (Resource Description Framework Site Summary) files which contain pointers to their latest news items in a format which can be used by other operators to embed such links in their own content, and sites such as News Is Free (www.newsisfree.com) even create such files for Websites which do not themselves participate in this exchange. It is not difficult to extrapolate from this sharing of headlines to a sharing of the full content of articles across a network of affiliated sites, which would then constitute a decentralised network of peer-to-peer publishing sites that would also satisfy a more narrow technological definition of p2p, and be less vulnerable to attacks.

Sites such as Indymedia.org, which amalgamates content from the Websites of Indymedia centres around the world, and MediaChannel.org, which features material from more than one thousand affiliated media news and issues sites, already operate such networks in a limited fashion. A related development is the idea of a semantic Web (supported by WWW inventor Tim Berners-Lee), “an extension of the current one, in which information is given well-defined meaning, better enabling computers and people to work in cooperation” (Berners-Lee, Hendler & Lassila 2001: 2). In this environment, distributed content from various sites could easily be combined into a single news feed on the user’s rather than the server’s side, much as users of filesharing software can download content from sources all over the Internet to their own harddrives. Provided news and commentary ‘upload’ functions for this semantic Web also exist, this system would satisfy even the most orthodox of p2p definitions.

Much in the same way that open source has become the dominant paradigm for Web-based software development projects, then, we might expect to see that p2p publishing will become an important form of Web-based information exchange. User-driven collaborative publishing in its various forms is now employed in a variety of highly diverse communities, and will provide an important counterpoint to what is seen as the increasing colonisation of Web content by commercial interests.

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Address for correspondence
Dr Axel Bruns
Media & Communication
Creative Industries Faculty
Queensland University of Technology
GPO Box 2434
Brisbane, Qld. 4001
Australia
a.bruns@qut.edu.au