Guide to Large-scale Publishing with

Drupal™

Brought to you by:

mediacurrent ℠ **INTERACTIVE SOLUTIONS**   and   **phase://technology**
*open source. *open minds.*

What's inside:

I. Summary

Modern audiences expect content distribution at a break-neck pace. The publishing model has changed from "let's put print content online" to "let's think in web terms first". Revenue numbers indicate that readers are fleeing print publications for web-based news[1]. A publisher's ability to respond to trends in online news and information delivery is critical to success with readers.

Modern Content-Management Systems ("CMS") help you keep up with innovations and trends. In particular, the developer communities of *open-source* CMSes have aggressively adopted new technologies and audience patterns in ways that vendors of proprietary CMSes — with their comparatively small developer resources — haven't been able to match.

Publishers who previously adopted commercial or home-brewed CMSes are now considering open-source replacements. They want to:

- **Lower total costs**;

- **Avoid reliance on a single vendor or key staffers for support**; and

- **Take advantage of current and emerging publishing standards** such as the Semantic Web.

Among the hundred or so open-source CMS options[2] [3], Drupal has emerged as the leader for enterprise-grade publishing[4]. It's a stable platform for managing and growing a news website that also allows publishers to interact with its reader community. It allows content-sharing among multiple properties, and integrates well with outside sites and tools such as Facebook and Twitter.

This paper examines Drupal's fitness for large-scale publishing based on typical publisher needs, maturity of publishing applications, and integration with existing roles within publishing organizations. It focuses particularly on news publications, but its findings are relevant to other publication types and formats such as magazines; associations; and broadcast.

It specifically examines a Drupal distribution that's highly optimized for publishing (OpenPublish[5]). In particular it looks at OpenPublish's use of tools for the Semantic Web, which automatically creates intelligent relationships among pieces of information.

Finally, it describes how two publishers adopted, manage, and use Drupal to deliver content.

---

1 http://www.marketingcharts.com/print/newspaper-revenue-dives-28-in-q3-online-falls-17-11151/
2 http://www.cmsmatrix.org
3 http://en.wikipedia.org/wiki/List_of_Content_Management_Systems
4 "Open Source CMS Market Share Report 2009", 5 "Open Source CMS Market Share Report 2009",
   http://www.cmswire.com/downloads/cms-market-share/
5 http://www.opensourceopenminds.com/openpublish


II. Past Practices, Future Opportunities

Any proposed online publishing strategy must take into account your past practices, present needs, and future plans. **A successful content-management system must be**:

- **Adaptable to existing processes and future needs.** "Solutions" that require staff to learn radically new skills or procedures will delay successful implementation.

- **Ready to take advantage of today's web from Day One.** Regardless of what features you intend to put on your site, your CMS should already be able to do it, with little or no additional development.

- **Expandable for development.** Nobody knows what tomorrow's web will bring. For a CMS to have a long life, it needs to have both a design that can easily incorporate new technologies *and* a developer community able to implement them.

Regardless of what happens, we expect publishers will continue to have needs in both content production and business. We'll consider how Drupal performs with primarily content management in mind, but will also highlight areas in which it can be helpful to the business of content.
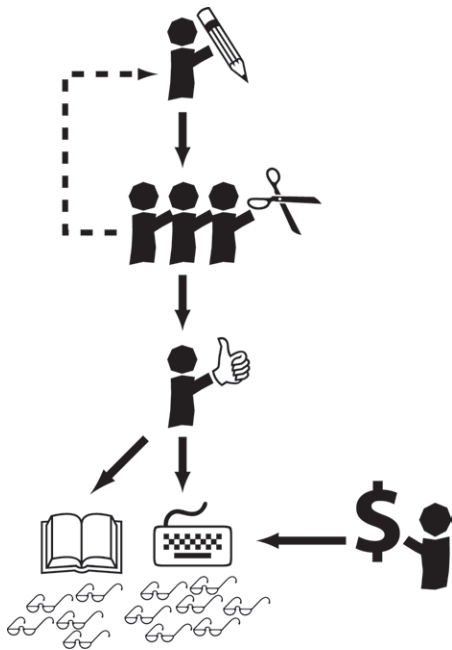
Traditional publishing workflow: The writer oiginates; editors alter (and sometimes demand rewrites); a managing editor approves; ad sales, memberships, or subscriptions make possible publication in print and on the web, which serves readers.
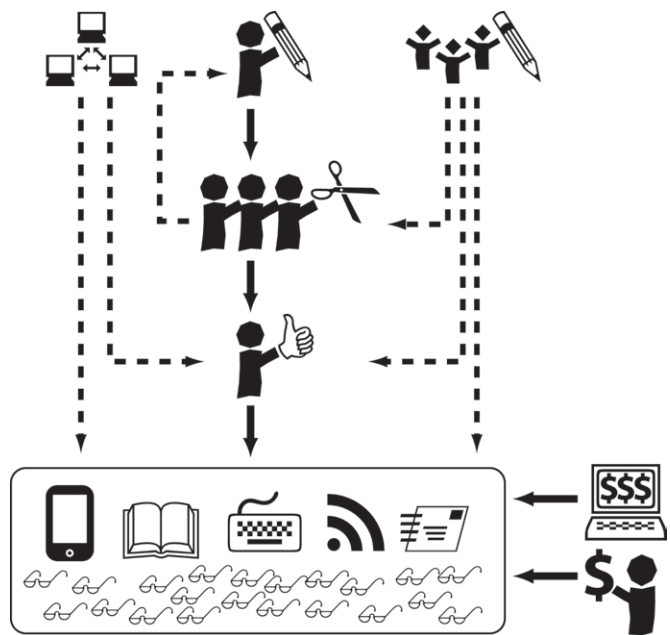
Modern publishing workflow: Content originates from writers, users, or other sites and gets varying amounts of editing; ad networks such as Google Adsense augment direct ad sales, with far less revenue coming from memberships or subscriptions than before; publication occurs via print, the web, email, RSS, and device-specific feeds.

mediacurrent ℠
INTERACTIVE SOLUTIONS

mediacurrent.com
866-507-0005

phase·//technology

phase2technology.com
703.548.6050

3

III. Fulfilling Content Needs

Content management

Traditional publishing recognizes three editorial roles: writers, editors, and managers. These roles have largely blurred in the past few years, particularly online.

First, writers enter raw content though a web browser. By default, Drupal enforces plain-text entry. However, the addition of the free, ready-made Wysiwyg module[6] also lets staff add text styling in a word-processing-like environment.

Once content is in the system, changes can be tracked in rough fashion using Drupal's "revision" feature, which becomes more feature-rich with the addition of the diff module[7]. When ready, content is made public through a simple "Published" checkbox. As is typical in Drupal, extensions such as the Scheduler module[8] extend this functionality.

Many publications now encourage writers to produce blog posts, often with less editorial oversight than in feature articles. (Drupal's core package includes a "blog" feature, and extensions such as Views module[9] add flexibility to it.) Publications also take advantage of free content provided by users and other publications' RSS "feeds". Drupal facilitates both reader contributions and RSS feeds naturally in its core package through the Node, Comment, and Aggregator modules.

Content presentation

In years past, online publishing typically ends with only one outlet: the web. This is still true for some legacy CMSes.

But Drupal can additionally deliver content in other formats, including:

- **RSS feeds**: RSS formats content in a structured way for subscribers. RSS subscribers can be either individuals, who see the content through RSS reader programs, or other web sites, which republish it. Drupal lets you choose how much information to deliver via RSS.

- **Twitter**: This enormously popular "microblogging" service allows people to post messages up to 140 characters from a variety of devices, including mobile phones. Its immediacy and convenience have made it a

Publishers Already on Drupal
- The Economist, economist.com
- The Root (Slate), theroot.com
- Mother Jones, motherjones.com
- Miami Herald, miamiherald.com
- MacLife, maclife.com
- Men's Health Magazine, menshealth.com
- Foreign Policy, foreignpolicy.com
- Lifetime TV, mylifetime.com
- Future US, Inc., futureus.com
- The New York Observer, observer.com
- Us Weekly, usmagazine.com
- Popular Science, popsci.com
- Playboy (Germany), playboy.de
- Governing, governing.com
- NowPublic: nowpublic.com
- Fast Company, fastcompany.com
- Rejseliv, rejseliv.dk
- Indymedia.be, indymedia.be
- El Espectador, elespectador.com
- Rue89, rue89.com
- Columbia Spectator, columbiaspectator.com
- GazetteNET, gazettenet.com
- Bluffton Today, blufftontoday.com
- mediaME, mediame.com
- PRI's The World, theworld.org
- Information.dk, information.dk
- Snowboard Magazine, snowboard-mag.com
- World Pulse, worldpulse.com
- Linux Journal, linuxjournal.com
- St. Louis Review, stlouisreview.com
- Vancouver Magazine, vanmag.com
- Foreign Affairs, foreignaffairs.com

Journalism organizations on Drupal
- Society of Environmental Journalists, sej.org
- Project for Excellence in Journalism, journalism.org
- PR Watch, prwatch.org
- Newswatch, newswatch.in
- Journalisten, journalisten.dk
- Mediawatch.dk, mediawatch.dk

More listed at
- skitch.com/drupalrocks
- groups.drupal.org/node/5100

6 http://www.drupal.org/project/wysiwyg; included in Acquia Drupal. A similar module in included in OpenPublish.
7 http://www.drupal.org/project/diff
8 http://www.drupal.org/project/scheduler
9 http://www.drupal.org/project/views; included in Acquia Drupal and OpenPublish
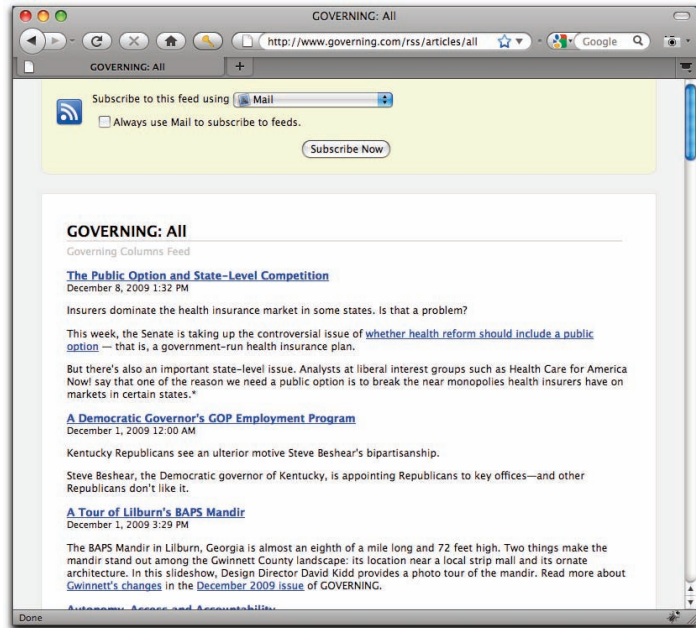
primary way that some people find news and information. There are several Drupal modules that interact with Twitter, both to deliver your content to it and to take advantage of others' Twitter content. The primary one is the Twitter module[10]. At its base it simply pipes your selected content to Twitter. But it also integrates with other modules (such as Views) to give you complex control over how your content hits the Twitter network.

- **Mobile**: The iPhone, Kindle, Sony Reader, and now the iPad. The success of publications on these devices are sure signs that the future of reading is, like its past, mobile.

An RSS feed that shows the title, publication date, and "teaser" summary of stories published on the Drupal-run site governing.com. *The administrator has chosen to require readers to visit the site — and view its ads — to read the full stories.*

Unfortunately, not all unmodified web sites look good on mobile devices. First, some sites depend on wide screens, while internet-capable phones have screens as narrow as 240 pixels wide. (The iPhone's screen is 320 pixels wide; a laptop's screen is typically at least 1024 pixels wide.) Second, some technologies don't work on portable devices; the lack of Adobe Flash on the iPhone is a common example. Third, design and implementation differences between desktop and mobile devices make some features, such as navigation, seem awkward on small devices.

Drupal naturally make sites mobile-friendly by adhering to internet standards. For example, the Kindle can read news feeds output in *RSS* format, which core Drupal does without modification. Output is determined by a site's *theme*; although a theme designer could force a theme to create non-standard HTML, Drupal's design discourages that. Some themes, such as .mobi[11], are designed specifically for use on mobile devices.

In addition, several modules translate your site into mobile-friendly forms on the fly. Mobile Tools[12] and Mobile Plugin[13] are both multipurpose projects that (among other things) detect mobile devices and switch to mobile-ready themes when needed. If you prefer not to adapt your sites in ways those modules require[14], two other modules use third-party services to convert your site on the fly from its current appearance: Osmobi[15] and Mobify[16].

10 http://www.drupal.org/project/twitter
11 http://drupal.org/project/mobi
12 http://drupal.org/project/mobile_tools
13 http://drupal.org/project/mobileplugin
14 A thorough comparison between the two methods is at http://osmobi.zendesk.com/forums/82905/entries/79668.
15 http://drupal.org/project/osmobiclient
16 http://drupal.org/project/mobify

mediacurrent
INTERACTIVE SOLUTIONS
mediacurrent.com
866-507-0005

phase //technology
phase2technology.com
703.548.6050

5

But mobile devices aren't the same as desktop ones, so it's not enough to simply change a site's display. Other modules give your site access to mobile devices' special features[17]. One example is the ec_mobillcash payment gateway[18], which accepts payments via mobile phone without any credit card account needed.

Small phone screen: 128 x 160 pixels

iPhone screen: 320 x 480 pixels

Computer screen: 1024 x 768 pixels

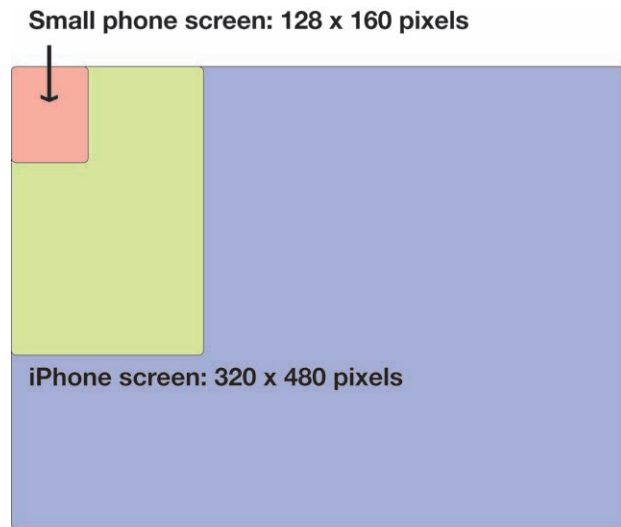*Comparison of portable device vs. computer screens*

- **Google Wave**: Although this collaboration tool is still new, it's already gained a lot of attention for special, community-based projects. The Seattle Times won a Pulitzer Prize and demonstrated its usefulness by hosting a collaboration environment — called a Wave — in order to enlist local readers to help catch a suspected murderer. Over 500 people participated by contributing tips and sightings. Waves can also carry multimedia content to enable "citizen journalism" at events.

The Drupal Wave project[19] is a suite of modules to integrate Drupal with Google Wave. Like the Twitter module, it's bi-directional, allowing both publication of your content to existing Waves and subscription to others' Wave content.

- **Facebook and other social networking sites**: People rely on social networking sites not only for personal connections, but for news and entertainment as well. The largest, Facebook, is the second most-trafficked site on the Internet, surpassed only by Google[20]. It claims over 350 million active members, of whom over half log in on any given day[21].

To directly display your content on sites such as Facebook, you generally have three methods: Through RSS feeds, through "Pages" you create on the site, and through "Applications" that use the site's application programming interface (API).

We've already described how Drupal delivers RSS feeds that are suitable for virtually all social networking sites that accept them. Administrators may have to create a "link" between the feed and the site. On LiveJournal, for example, you have to "syndicate" the RSS feed by creating a pseudo-user[22]. However, this is a fairly simple one-time process. Similarly, content providers usually need to create Pages on social networking sites manually, but from then on enjoy trouble-free content delivery to members of that site.

---

17 The article "Mobilize, Don't Miniaturize" describes some general ways to improve the mobile experience on your site: http://www.littlespringsdesign.com/blog/resources/mobilize/
18 http://drupal.org/project/ec_mobillcash
19 http://drupal.org/project/wave
20 http://www.alexa.com/siteinfo/facebook.com. Retrieved 24 December 2009.
21 http://www.facebook.com/press/info.php?statistics. Retrieved 24 December 2009.
22 See http://www.livejournal.com/syn/

The third syndication method, which takes advantage of the social networking site's API, requires either custom programming or a ready-made extension to translate information between your CMS and the targeted site. For Drupal administrators, several such "translators" are available, such as the Drupal for Facebook module[23].

- **Multimedia**: Drupal's software design pairs text-based content from its database with binary files from the server's file system. Those files can include virtually any form of multimedia, such as photos, video, audio, and vector-based graphics.

  Many multimedia formats appear "naturally" as a function of HTML and the reader's web browser. For example, typing `<img src="/sites/default/files/image.jpg">` in an article would display the image.jpg graphic as long as Drupal's "Full HTML" filter was on.

  Some multimedia formats benefit from modules that improve or simplify their presentation. Among them are Embedded Media Field[24], which automatically determines the best way to embed third-party multimedia content; SWF Tools[25], which simplifies the addition of Flash files to your site; and Flickr[26], which draws images and image sets from the popular photo-sharing site flickr.com.

Some of the most popular social-networking sites

- **Email**: Email news delivery is nothing new: The technology journal TidBITS (tidbits.com) has published via email since 1990. Email remains a primary means of news delivery.

  Email's special strength is in delivering breaking and time-sensitive news. Many readers today are connected to their email accounts all day long through portable devices, and read email as soon as it arrives; it delivers immediacy no other format yet matches.

  In Drupal, most email publishing tasks are handled through the free Simplenews module[27], which is supported by several other free modules for statistics, scheduling, and the like. Other Drupal modules facilitate integration with third-party email service providers, including StreamSend, Zimbra, MailChimp, Google Groups, and Inxmail.

In short, the question isn't whether a particular content-delivery option is possible on Drupal, because it almost always is. The difficult part is finding, evaluating, and implementing the appropriate modules. There are currently over 580 extensions to Drupal related to content display and output[28], but this collection is a mixed bag in terms of usefulness and stability. Starting with

---

23 http://drupal.org/project/fb; in development as of 26 December 2009.
24 http://drupal.org/project/emfield; included in OpenPublish
25 http://drupal.org/project/swftools; included in OpenPublish
26 http://drupal.org/project/flickr; included in OpenPublish
27 http://drupal.org/project/simplenews
28 According to the "Content display" module category, http://drupal.org/project/modules. Retrieved 20 December 2009.

OpenPublish instead of core Drupal, and getting the guidance of an experienced Drupal consultancy, will greatly help you implement features that are both well-designed and appropriate for your needs.

Content sweetening with the "Semantic Web"

The mid-2000's saw an explosion of developers who combined two works to form a new creation called a "mashup" that's derivative of both, yet unique and compelling in its own right. Housingmaps.com was an early example that combined Craigslist.com classified ads with Google Maps to produce mapped apartment listings that were much more accessible to readers. As these mashups grew popular, content technology companies made their information available through *APIs* to encourage and "bless" them.

The next phase of such mashups adds machine intelligence to the mix. **Now a news story about a company in India could include a map of the company's headquarters, a photo of the company's CEO, and links to other stories about the company — all automatically.** Natural-language processing algorithms examine the text and extract meaningful "entities" such as addresses, names, and dates. Once identified, such entities can appear in helpful formats (such as maps and calendars) or be collected by subject matter. This system is collectively known as the semantic web.

On Drupal, one example of how you implement such functions is through OpenCalais, a project by Thomson Reuters[29]. (The service is free for "up to 50,000 transactions per day at a maximum rate of four transactions per second"[30].) Drupal's connection to OpenCalais is through the Calais Collection[31], one of the core components of OpenPublish.

Several other modules help gather and display information from outside sources. A geocoding service such as Google Maps provides maps to accompany location-specific stories (via the GMap Module[32]), while information from sites such as Weather Underground[33] augment them with current climate conditions. The Apture module[34] lets you browse content from popular third-party sources based on a keyword search, while the More Like This module[35] works with OpenCalais to direct readers to similar content.

29 http://www.opencalais.org
30 http://www.opencalais.com/CommercialCalais
31 http://drupal.org/project/opencalais; included in OpenPublish
32 http://www.drupal.org/project/gmap; included in OpenPublish
33 http://www.wunderground.com
34 http://drupal.org/project/apture; included in OpenPublish
35 http://drupal.org/project/morelikethis; included in OpenPublish

Drupal History

Drupal originated as a project of Dries Buytaert to share information among his colleagues at the University of Antwerp. It now powers approximately 250,000 known web sites worldwide[S1], and is downloaded from drupal.org approximately 60,000 times per week[S2]. Notable points in its history include:

- **2001**: Drupal 1.0 released under the GPL open-source license. Versions 2 and 3 follow later the same year.
- **2004**: Supporters of Presidential candidate Howard Dean give Drupal wide exposure by building the largest Drupal site to date and promoting the software.
- **2007**: Dozens of publishers running Drupal. Drupal support company Acquia founded, raises $7 million in venture capital.
- **2009**: Semi-annual DrupalCon in Washington, DC sells out its 1,400 seats. Hundreds of publishers running Drupal. Quantified Top 100 web property examiner.com moves to Drupal[S3].
- **2010**: WhiteHouse.gov migrates to Drupal. 3,000 people attend DrupalCon San Francisco. Expected release of Drupal 7, with fourteen of the twenty most popular modules incorporated or available on the day of its release.

[S1] According to http://drupal.org/project/usage. Retrieved 27 December 2009.
[S2] "Open Source CMS Market Share Report 2009", http://www.cmswire.com/downloads/cms-market-share/
[S3] http://drupal.org/node/577526

Reader engagement

Despite their reputation as a "one-to-many" medium, periodicals have encouraged two-way communications for hundreds of years. What has changed is the speed, volume, and interactivity of reader involvement. Letters to the editor have become comment threads; puzzles are real-time games; polls are now instantaneous and multidimensional.

The simplest of these — story commenting — is part of core Drupal (in the Comment module) and can be enabled or disabled on a story-by-story basis. Drupal's system of user permissions lets you choose whether to allow anonymous comments or require editor approval of comments posted by users below a certain trust level.

Other Drupal modules that encourage reader engagement include:

- User Points[36], which automatically advances a user's trust levels when they perform desirable actions, such as posting content or moderating others' comments. Drupal can also be configured to display current User Points "winners", further engaging readers in a contest-like environment.

- Fivestar[37], which allows readers to "rate" content on a scale that you define.

- Poll (included in core Drupal), which surveys readers' opinions.

An example of a story with the Fivestar rating feature available.

Two challenges face the publisher who wants to implement such reader engagement programs. First, publishers need to determine how much interaction is desirable and appropriate for the site, and create a well-defined schema for how it will happen. Then, as with content delivery, the issue is to find, evaluate, and implement modules that fulfill those goals while working well with core Drupal. As always, the guidance of an experienced Drupal consultant is invaluable.

36 http://drupal.org/project/userpoints
37 http://drupal.org/project/fivestar; included in Acquia Drupal and OpenPublish

IV. Fulfilling Business Needs

Monetization

Fifteen years after the internet's commercialization, online monetization is still chaotic. The standard publishing mix of display and classified ads is proving challenging: Banner ads have too low a return to support internal salespeople, and few people pay for online classified ads. So you have to be able to take advantage of any opportunity that comes along, and stay on top of new ones as they appear. While the purpose of this paper is not to provide overall monetization strategy, using Drupal as a publishing platform allows easy integration with advertising tools or with a paid content wall.

Advertising

Here are some ways to turn online publishing assets into dollars.

- **Contextual ads** pair advertising with relevant content. For example, a story about New Year's resolutions might be matched with an ad for gym memberships. Several companies automatically provide this sort of ad-matching service. (Google's AdSense for Content program[38] is the biggest.) The result is a premium audience that's motivated to know more about the advertised subject.

- **Remnant advertising** is the online equivalent of "loose paper" sales. Companies such as Advertising Connection[39] and Universal Media Syndicate[40] are two agencies providing this service.

- **Affiliate programs** essentially let your publication be a lead-generation sales tool for advertisers. You receive payment for sales completed or "quality" traffic driven to the advertiser's site. Amazon[41] and eBay[42] are two of the biggest companies with affiliate programs.

- **Search**. By far the biggest player in search is Google's AdSense — you receive a cut when anyone clicks ads displayed with the search results. Drupal's AdSense module[43] gives you control over where ads are displayed and allows you to monitor who's seeing them.

38 https://www.google.com/adsense/static/en_US/Publishertools.html
39 http://www.advertisingconnection.com
40 http://universalmediasyndicate.com
41 https://affiliate-program.amazon.com
42 https://www.ebaypartnernetwork.com
43 http://drupal.org/project/adsense

- **Sponsored links** are a form of premium-priced contextual advertising that is given preferential placement, typically above other text-based ads.

- **In-text ads** turn text *within* your content into hyperlinks to ads. For example, in the sentence "The pair met at a popular restaurant", the word "restaurant" would appear with a distinctive double-underline beneath it.

Traditional advertising revenue streams include:

- **Display ads**. As with search, Google is a major source of publisher money in this category, as its AdSense for Content service delivers both text- and image-based ads. Both can be managed through the AdSense module. However, it's far from the only player, and Drupal has modules that integrate with (among others) AdBard and lat49.

- **Classified ads**. Classifieds themselves are not a big moneymaker. But they remain popular site draws, particularly in smaller cities and among older demographics. Drupal's Classified Ads module[44] handles their scheduling and display, or you could use the Views module for highly customized configurations.

Many of these advertising opportunities are supported by Drupal modules. Those for which no specific module is available are still possible, usually by injecting some code into your pages. (There are several ways to do that in Drupal.)

You could continue to sell display and classified ads the same way you always have, and have your salespeople and designers manually add them to your Drupal site via the mature Advertisement module[45].

Paid Content

Publishers who colonized the early web planned to make money by charging for content, just as they had in the print format. But they were quickly undermined by their competitors, who offered their content for free — and the expectation of free content was born.

Now online publishing has come full circle, with several publishers returning to a paid-content model. The first to do so were those with high-value brands, including The New York Times, The Wall Street Journal, and The Economist. But now some smaller papers, such as the Stockton (Calif.) Record, have tried reinstating a "pay wall" for some content. With each publication that succeeds in doing so, more will be able to join them.

There are several possibilities for making paid content profitable. The Stockton Record still allows visitors access to three articles per month — a taste that it hopes will be enough to prove the value of their content, but not

44 http://drupal.org/project/ed_classified
45 http://drupal.org/project/ad

so much that potential subscribers will be satisfied. Other plans, paid weekly, provide greater access, or combine online access with delivery of the print edition[46].

Another method is similar to the iTunes Store, which allows customers to buy individual songs or other digital content for a small amount, typically $0.99. For print content such "micropayments" are possible on Drupal through a shopping-cart system such as Übercart, and merchant service providers such as Authorize.net. Other non-web venues, such as Kindle and iTunes itself, are likely to become active places for customers to purchase individual pieces of content that are served by Drupal.

Whatever payment systems you choose, it's very likely that supporting Drupal modules already exist for them; if not, custom programming by an experienced consultant will bridge the gap.

Your News and Information Access Options

	All Access (Print + Premium Online Access)	Premium Online Access	Print Home Delivery	Registered Member	Visitor
Print Delivery	✔	✖	✔	✖	✖
Local Online Articles (News, Sports, Business, Lifestyle, Entertainment, Opinion, Etc.)	✔	✔	10 per month if Registered	10 per month	3 per month
Mobile News Articles	✔	✔		10 per month	3 per month
Local Online Videos	✔	✔	3 per month as Visitor	10 per month	3 per month
Online Archives	✔	✔		10 per month	3 per month
Community Database Searches	✔	✔		10 per month	3 per month
Obituaries	✔	✔	Limited	Limited	Limited
Photo Galleries	✔	✔	Limited	Limited	Limited
E-Record	✔	✔	✖	✖	✖
Email Newsletters	✔	✔	✖	✖	✖

Some of the paid-content options for the Stockton Record

Cross-promotion

Publishers are experts in creating and managing content. But online promotion is a new, ever-changing field that's outside of the publisher's traditional experience. As a result, many excellent sites launch with great fanfare... and then fade away as readership lags expectations.

But successful online promotions are possible. First, every publication should have its own account on the major social networks, particularly Twitter and Facebook. These can host blog posts, headlines for major stories, and notifications. (Twitter-only contests are one way to keep people watching.) Second, your own site should have engagement tools that let readers do your promotion work for you by forwarding stories to friends, recommending your content on Digg, and so on.

It's no longer an option to be hostile to the promotional opportunities presented by Twitter et al. One daily did that, forbidding its reporters to tweet under the paper's banner. Cut off from one of the 21st century's main communication channels, they lost scoops; some journalists left; and, predictably, readership declined.

Connecting people

The real gold in social-networking sites such as Facebook is the connections they foster among friends within the site. A few years ago, each site was a "walled garden": Connections made on one were valid on that site alone. The belief was that a member's login and network were the valuable property of the site.

46 Subscription plans detailed at
http://www.recordnet.com/apps/pbcs.dll/misc?url=/static/premiumContent/premiumOffer.html

mediacurrent *INTERACTIVE SOLUTIONS*
mediacurrent.com
866-507-0005

phase //technology
phase2technology.com
703.548.6050

12

But as the social networking phenomenon grew, competition among sites forced a change in this attitude. Starting around 2004, it was common for people to belong to several social-networking sites, switching and abandoning networks frequently. The ones that survived acknowledged this pattern by making it easier to carry one's "personality" from place to place.

Drupal appeals with several ways to leverage memberships in other sites to spread your content — and your brand. For example, you could allow people to log onto your site using a membership standard called OpenID, tools for which are included in core Drupal. You can go further than that on Facebook using the "Facebook Connect" module[47], which also encourages viral migration by re-connecting Facebook friends on your own site. For promotion, the AddThis Button module[48] is among several that make it easy for people to spread word of your content through sites such as Facebook, MySpace, and Digg.
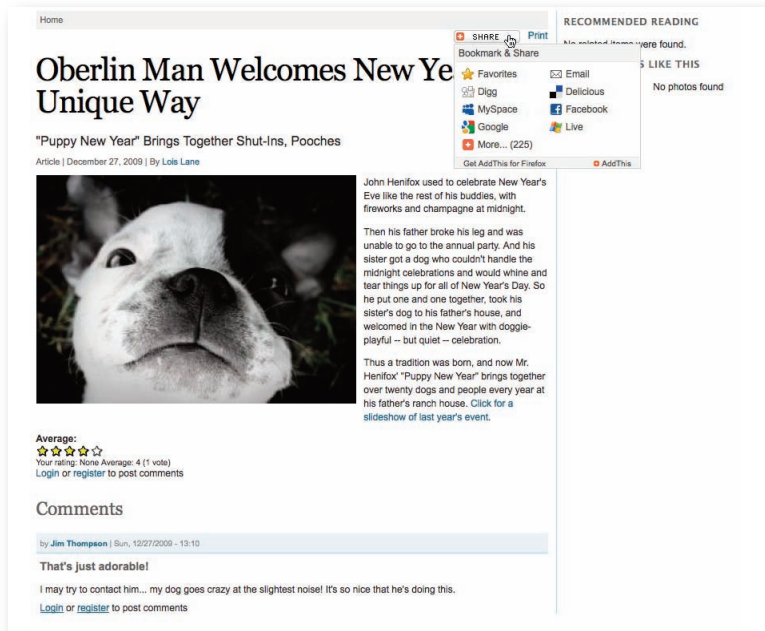
A news story with AddThis (selected), Fivestar ratings, and commenting enabled.

47 http://drupal.org/project/fbconnect
48 http://drupal.org/project/addthis; included in OpenPublish

V. Why Drupal for Publishing?

Drupal competes against commercial CMSes, at least one of which claims to be "specifically designed for the demands of the publishing industry". How can you intelligently compare the two?

Regardless of what marketing promises, three evaluation criteria stand out:

- **Adaptability beyond current needs.** Single-purpose tools fail when the purpose changes. Ten years ago, nobody expected that publishers' web sites would include community discussion, or that readers would promote news stories via "tweet". CMSes unprepared for such change are doomed to a short lifecycle.

- **Vendor ecosystem.** Many publishers who adopted a CMS five to ten years ago are now discovering the frustration of moving to a new one. Your best insurance against that is to look not only at the CMS' software, but also at its support system. Does it depend on a company's fortunes? Does it require some third-party software or web services that could fail? Who is likely to develop for it ten years from now?

- **Total cost of ownership.** No CMS will serve you well if it's unaffordable. Several factors, including maintenance costs, determine total cost over time.

Adaptability: Drupal and innovation

A CMS' adaptability is defined partly by the software itself. If it offers no hooks, then the only way to access its processes is through hacks. It also must make that programming easy to manage, so that developers can quickly create and test proposed extensions, and administrators can implement it painlessly. The two keys to forward-looking development are Application Programming Interfaces (*APIs*) and development tools.

APIs are well-documented openings built into software to allow for future expansion by independent programmers. For example, let's say you want to publish both to print and the web. You could "hardwire" instructions for those two output formats into your program: That would be straightforward, but would limit output to those two formats unless you later hardwired other formats. With the API approach, you would make your program send output to *all* formats that are defined in a separate place. Anyone with access to the API could define a new output format and put it in that "separate place", so your program could also ultimately format its output for cell phones, smart devices, or any format. With the API approach, the program is infinitely expandable.

mediacurrent
INTERACTIVE SOLUTIONS
SM
mediacurrent.com
866-507-0005
phase // technology
phase2technology.com
703.548.6050
14

That's exactly how Drupal works. Its API[49] is extensive, freely available, and well documented. Commercial CMSes vary tremendously in their APIs availability. Few make theirs available at all, which means you have only one source for custom features — the vendor itself. When considering CMSes, it's wise to ask your development team to examine their APIs to be sure they'll be able to use them.

Likewise, development tools greatly ease the process of creating custom functions. As Drupal is written mostly in PHP, all tools that target that language are useful in Drupal development[50]. (Tools are also widely available for the Drupal's other two major languages, CSS[51] and JavaScript[52].)

Documentation for Drupal's API

Ecosystem: Drupal as a standard

Over 800 people worked on the first pre-release of Drupal 7[53] and more than 350 blogs discuss Drupal regularly[54], making it one of the most collaborative software projects in the world. Its success has even attracted the attention of Microsoft, which features it in its Web App Gallery[55] as an application that works well on its server platform.

Much of Drupal's strength comes from being open-source software[56]. As such, its license gives everyone the right to download and use the software for free and without restriction. The license's main stipulation is that, if you make any changes to the Drupal software itself, you must share the "derivative work" with the community under the same terms.

Open-source software such as Drupal has several advantages:

• **It can't be controlled by any single vendor**, since everyone has a right to acquire and change it for free.

• **It can quickly grow a user base** — although those users will only stick with a project if it proves to be useful and usable.

• **It encourages serendipity**, as hobbyists and professional developers around the world tweak the software in ways that no individual vendor could possibly imagine.

---

49 http://api.drupal.org
50 A list of fifty useful PHP tools is at http://www.smashingmagazine.com/2009/01/20/50-extremely-useful-php-tools/
51 A list of fifty useful CSS tools is at http://www.smashingmagazine.com/2008/12/09/50-really-useful-css-tools/
52 A list of fifty useful JavaScript tools is at http://www.smashingmagazine.com/2009/02/08/50-extremely-useful-javascript-tools/
53 http://drupal.org/drupal-7.0-alpha1
54 http://drupal.org/planet
55 http://www.microsoft.com/WEB/gallery/AcquiaDrupal.aspx
56 A well-known definition of "open source" are at http://www.opensource.org/docs/osd; a related definition of "free software" is at http://www.gnu.org/philosophy/free-sw.html.

mediacurrent ᔆᴹ
INTERACTIVE SOLUTIONS
mediacurrent.com
866-507-0005

phase //technology
phase2technology.com
703.548.6050

15

- **It has great potential to become a standard by consensus**, as all interested parties have an (ostensibly) equal chance of being heard.

Other open-source projects found widely in enterprise settings include Linux (operating system), Apache (server technology), MySQL (database), and Firefox (browser).

Cost of Drupal compared to other CMSes

As free software, Drupal clearly has a lower cost of acquisition than proprietary CMSes. But how does its total cost of ownership (TCO) compare to such popular publishing packages as FatWire and Vignette? How easy is it to find professional services, and at what price?

On one hand, being locked into a single vendor means you're at the mercy of that vendor. On the other, open-source development suggests that nobody is ultimately responsible, that you'll end up scrambling to solve your own problems when calls for help return only a dead silence. Two factors give Drupal a level of enterprise-quality support that's unusual for open-source projects.

First, the not-for-profit Drupal Association oversees day-to-day details that support Drupal's developers, such as finance for special projects, Drupal's proprietary business elements (such as its trademark) and hosting for the Drupal.org web site.

A Drupal page with the Firebug plugin showing CSS styles. The "Configure/Edit view" menu is a feature of OpenPublish, a version of Drupal optimized for publishers.

Second, a growing number of businesses support Drupal in a multitude of ways. Most notable among these is Acquia, which provides support for core Drupal and many of its most-popular modules. Founded in 2007 by Drupal creator Dries Buytaert and Pingtel founder Jay Batson.

Acquia supports the Drupal ecosystem as a whole by providing resources to improve, stabilize, and strengthen both Drupal and a collection of key modules. These improvements are then released back to the community, as is required by Drupal's license. Acquia employs many of Drupal's most active and important developers, ensuring that enterprise customers are handled by those most capable of addressing them.

Regarding CMS cost, Acquia commissioned a paper that compares typical licensing, maintenance, and technical support fees for Acquia Drupal and several competing CMSes, with a focus on *social publishing*[57]. Acquia considered:

- The cost of support tickets, advising, and a specific amount of emergency support;

- A five-year period for all items;

- "Typical" sites, as defined by the software vendors themselves;

- A need to support up to 1,000 users

- An estimated annual maintenance and support cost equal to 20% of the original license cost.

The results expectedly showed Drupal to have a lower cost overall. But the *size* of the difference was shockingly large. In short: Acquia estimated that Drupal's five-year TCO was *at least* 80% below that of these competitors, and in one case was nearly 95% less.

> *"To effectively achieve its missions, the Department of Defense must develop and update its software-based capabilities faster than ever, to anticipate new threats and respond to continuously changing requirements. The use of Open Source Software (OSS) can provide advantages in this regard."*
>
> — "Clarifying Guidance Regarding Open Source Software (OSS)" memo, David M. Wennergren, Chief Information Officer, U.S. Dept. of Defense (October 2009)

---

57 "TCO for Open Source Social Publishing: Going Beyond Social Business Software",
   http://acquia.com/community/resources/library/tco-open-source-social-publishing, December 2009

VI. The All-In-One Solution: OpenPublish

One of Drupal's greatest strengths is the rich stock of free modules available to add new functions. But this wealth comes with the curse of too much choice. When four modules can do a given function, how can you know which suits your purpose best?

One solution is to try them all, a confusing and time-consuming process. Another is to hire a company that's familiar with them to make recommendations and develop alternatives when existing modules won't do. A third way is to start with an extended version of Drupal that's designed and tested for your purpose. For publishers, that solution is OpenPublish.

OpenPublish is a Drupal *distribution* that combines the latest version of Drupal and adds over 40 modules[58], a custom theme, and custom programming. It was created by Phase2 Technology, an independent Drupal consultancy in the Washington, DC area that focuses on creating and managing sites for large and midsize publishers.

OpenPublish builds on Drupal

OpenPublish uses Drupal to its full advantage in six ways:

*   **Administration.** The most obvious visual change in OpenPublish is its use of an elegant administrative interface, which includes two administrative toolbars, information-rich icons, and a custom theme. Deeper improvements include the addition of "helper" modules that simplify development, such as Devel, Token, and Chaos Tools; organizational modules such as Context and RDF; modules that keep your site up to date, such as Distro and the Install Profile API; the anti-abuse module Mollom; and content display modules such as Views and Panels. Finally, OpenPublish gives you the option of subscribing to Acquia's managed maintenance and search services by including the Acquia Connector and Acquia Search modules.

*   **Content.** OpenPublish adds two of Drupal's most often-requested features — image support and rich-text formatting — with a complex of modules, including FCKeditor, ImageAPI, ImageField, and ImageCache. Like Acquia Drupal, it also includes the CCK module so you can create
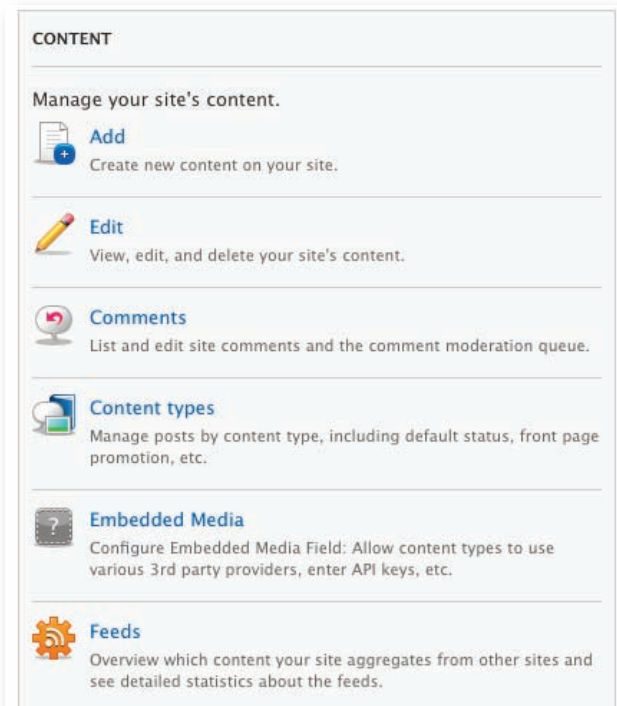
OpenPublish's custom administrative icons make improve usability

---

58 The additional modules are: acquia_connector, acquia_search, admin, apachesolr, apture, autoload, cck, cmf, contenture, context, ctools, custompage, date, devel, distro, emfield, fckeditor, feedapi, feedapi_mapper, filefield, flag, flickrapi, gmap, imageapi, imagecache, imagefield, imce, install_profile_api, link, login_destination, mollom, morelikethis, nodewords, opencalais, openpublish_core, paging, panels, pathauto, quantcast, rdf, swftools, tabs, token, topichubs, views. (Most are individually available at http://www.drupal.org/project/name.)

mediacurrent SM
INTERACTIVE SOLUTIONS
mediacurrent.com
866-507-0005

phase //technology
phase2technology.com
703.548.6050

18

your own content types, and comes configured with several content types that publishers find handy, such as Twitter Item, Topic Hub, Event, and Video. Drupal's taxonomy system is also beefed up with the addition of dozens of pre-configured categories, such as Company and Medical Condition. The addition of Acquia Search helps your readers find content more easily, while SWFTools helps you add interactive content in Adobe Flash format.

User roles preconfigured in OpenPublish. Site administrators define access permissions based on these roles, and can create new roles as needed.

- **Engagement.** Publishing becomes *social* publishing when it involves readers in multidirectional communication; they speak to the publication, and to each other, as much as the publication speaks to them. Readers, in short, get ego gratification as well as information from a social publishing site.

  Several parts of OpenPublish encourage such engagement. Readers can comment, tag, and rate stories (through the Fivestar module), with the most-popular (or best-rated) comments and stories being spotlighted. They can create their own blog posts; "flag" items for editor attention (for example, to prevent abuse); and delve deeper into subjects that interest them through Topic Hubs. The administrator, as elsewhere in Drupal, controls who is allowed to perform all of these actions, and can rescind permission easily as needed.
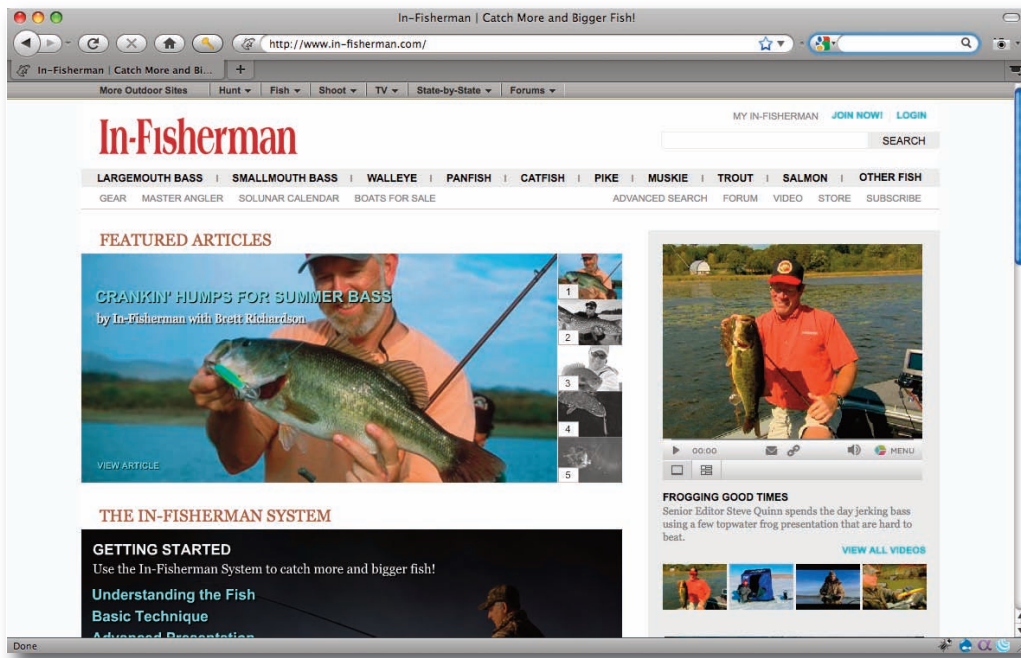
- **Optimization** for visibility by search engines. Several features in Drupal itself redound to publishers' benefits. Tagging (via the Taxonomy module) creates pages that are linked by subject, with each link essentially promoting the site as a resource around that subject. On a simpler level, the Pathauto module[59]) creates web addresses that refer to an article's content e.g. `http://example.com/bears-breaking-into-cars` instead of `http://example.com/node/1773`.

- **Promotion.** As mentioned earlier, Drupal naturally publishes content as RSS feeds. But it also lets you promote popular stories internally by counting page views on all stories and providing a linked list of those stories that rise to the top. OpenPublish also includes the AddThis Button module to promote site content through popular bookmarking sites such as Digg, MySpace, and Delicious.

- **Semantic Web.** The Open Calais module uses artificial intelligence to examine your content and automatically add tags, which both improve site navigation and make your stories more visible to relevant online searches. Open Calais also "geotags" location names mentioned in stories. Those geotags are then used by the GMap module to *show* readers where news events occurred on Google Maps.

59 http://www.drupal.org/project/pathauto

VII. Case Study: InterMedia Outdoors

InterMedia Outdoors (IMO) is a media company that covers outdoor sports, best known for its print publications such as Guns & Ammo and Fly Fisherman, in addition to regional titles such as Florida Sportsman and broadcast outlets such as the television network, "The Sportsman Channel". Its numbers are impressive, with over 23 million readers of dozens of regional and national titles, comprising 13,000 editorial pages; radio programming on over 550 stations nationwide; and over 200 episodes of original video programming broadcast 24 hours a day, seven days a week.

Such a massive media enterprise requires an equally impressive online presence, and IMO hosts over 40 sites. The job for maintaining and improving them falls to Chief Information Officer Howard Stevens, who has overseen their hosting on various content-management systems (CMSes), most notably one that was inherited from a publication's previous owner. In an effort to streamline and standardize the company's web operations, and to ensure technical flexibility for future changes, Stevens led a search for a new CMS.

The company reviewed several possibilities, narrowing the field down to a proprietary CMS and the open-source Drupal. For its high-profile Guns & Ammo publication, IMO went with the proprietary solution, in 2007, which was chosen because of the perception that it "would be supported by a company and require little or no in-house support." But IMO found that the software simply wasn't flexible enough. "We wanted to be able to share content among our sites, and to let people use the same login at all of them", he said. "But the new CMS wasn't able to deliver."

"So we went back and said, 'All right, we've probably put in as many internal resources for this as with an open-source solution. Only with an open-source solution, we'd be investing resources to develop new features that address our specific needs, as opposed to just keeping the thing running. By then we had three internal developers. Even though they weren't specifically familiar with Drupal, we felt more comfortable going with it, partly because it's open-source."

Current IMO web properties on Drupal

Defining needs

Regardless of what CMS IMO planned to use, it would need to meet some stringent requirements. The chosen CMS had to:

- **Migrate all existing content.** Years of existing articles and photos across dozens of IMO sites comprised an enormous, irreplaceable asset. (The In-Fisherman site alone had over 1,000 articles.)

- **Be able to handle current traffic, and scalable for future growth.** The In-Fisherman site alone gets more than a quarter million page views per month; total for all IMO sites is over 16 million, and growing. IMO required a CMS that can integrate well with a multi-host, multi-database architecture.

- **Permit flexible content organization.** IMO's publications lend themselves well to content sharing and categorization. A CMS with a flexible taxonomy system could provide a multiplier effect for content, making it accessible from diverse, reader-selected entry points.

For more details on IMO's specific needs — and how they were addressed by Drupal — see the In-Fisherman case study on the Drupal.org web site[60].

Success with Drupal

As a trial, IMO engaged Mediacurrent to rebuild the In-Fisherman site. They had several consultations to define requirements, set goals, and determine the best way to proceed. With a clear roadmap, Mediacurrent completed the migration during the summer of 2009.

The results were encouraging. "From an editor's perspective, the switch to Drupal has been great. They can update content much easier; there's a world of difference in efficiency for getting content uploaded," Stevens said.

---

60 "Enterprise-level Publishing Industry Drupal Site: In-Fisherman.com", http://drupal.org/node/497008

But beyond workflow improvements, Stevens was pleased with how Mediacurrent and Drupal were able to expand the site beyond what was possible with other CMSes.

> *"During the design and development process, there wasn't a feature we threw at Mediacurrent that they couldn't do. The flexibility was always there to implement new things."*

IMO used Drupal both to improve existing site features and to add new ones. For example, In-Fisherman magazine had long featured a "trophy room" where users could upload photos of their prize catches, with prizes and recognition awarded for the best ones. When that program started, it required readers to submit paper forms and photos. Drupal not only made online submissions easy, but also provided widgets to keep track of recent and popular uploads, and made it possible for readers to see and comment on *all* submissions, not just the winners.

One custom piece that Mediacurrent provided was a contextually targeted recommendation engine, which looks at a reader's profile and browsing history and compares them to those of people who browsed similar pages. Although the system was designed to become better the more it was used, IMO reported that page views immediately shot up.
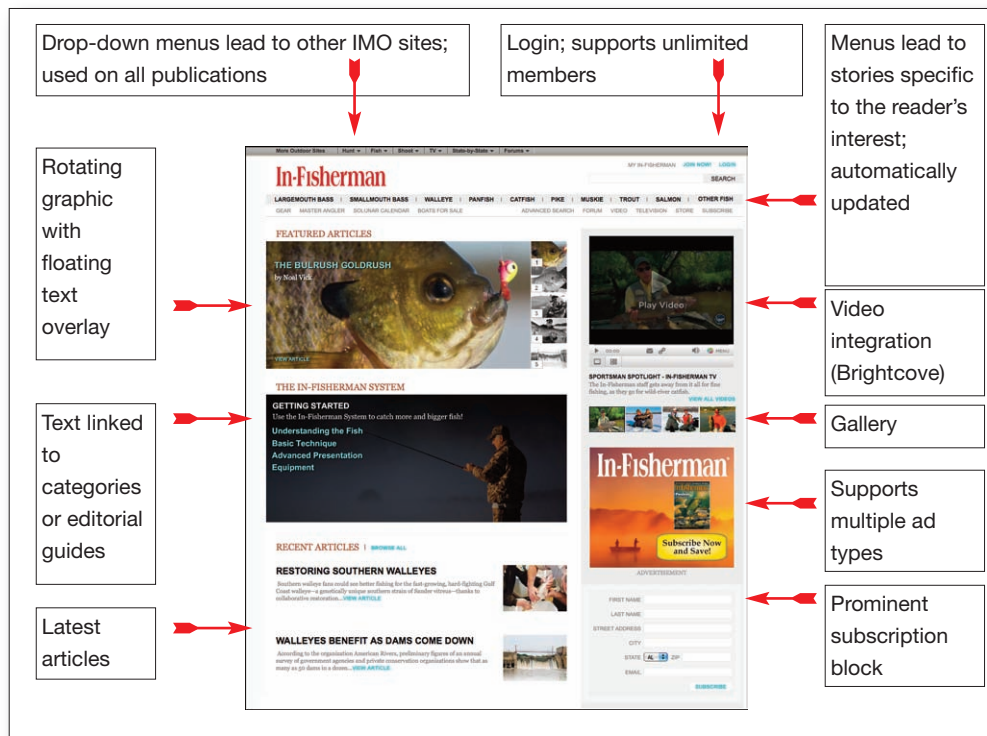
Some features of In-Fisherman's front page, made possible by a combination of Drupal, free modules, and custom programming

"Before, it was hard to find content from within the site: People would find our content on Google, read the article, and then typically head back to Google. Now each of our articles includes recommendations to other contextually relevant content to give visitors more of what they are looking for. The results have been tremendously positive."

Ultimately, Mediacurrent developed thirteen custom modules for IMO. These generally fell into three categories:
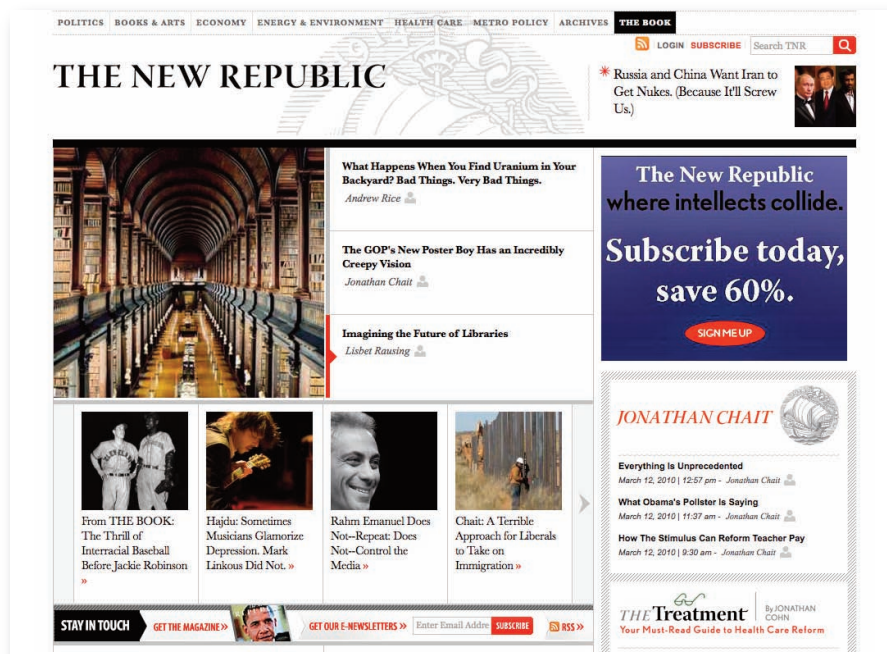
- **Content** modules that both share and display information in distinctive ways.

- **Input** modules include those for both one-time import (to correct file paths, for example) and ongoing maintenance (to improve forms and prevent user abuse).

- **Performance** modules that make the site run more efficiently, thereby preventing downtime and reducing server and bandwidth costs.

With the success of In-Fisherman and two other Drupal sites behind them, Stevens decided to recently migrate over the publication that had previously given them so much trouble — Guns & Ammo. In contrast to the proprietary solution they tried, Drupal gave them the flexibility to make the site exactly what they wanted.

"Put simply, Drupal had most of these features we needed, either 'out of the box', in contributed modules, or with a little customization. We saved money by not outsourcing it, and we didn't have to make any compromises for our readers."

mediacurrent ℠
INTERACTIVE SOLUTIONS

mediacurrent.com
866-507-0005

phase **//** technology

phase2technology.com
703.548.6050

23

VIII. Case Study: The New Republic

Chances are you've heard of The New Republic, a 95-year-old semimonthly magazine that focuses on American politics and culture. Its large online audience and traffic demand the need for a CMS that can deliver its highly influential content quickly, flexibly, and flawlessly.

The New Republic (tnr.com) was hosted on a proprietary CMS until a stipulation of its sale in 2009 required it to move to another CMS. According to Online Editor Greg Veis, OpenPublish Drupal was the obvious choice. Phase2 Technology was selected for the perfect combination of expertise in journalism and Drupal.

> *"OpenPublish's functionality is just right for a magazine like ours, and the price is right. With Drupal, we knew we wouldn't have to break the bank or spend a lot of time creating something new."*

The New Republic team's first priority was to get the current site up and running on Drupal, so Phase2 had to work quickly. Along the way Phase2 found numerous ways to improve on the old site's functionality, especially as it related to editor and reader experience. The results included a streamlined workflow, better access to content, and greater revenue through increased page views. But before any of that could happen, they had to move the magazine's existing online content and other assets.

24

Migrating data

The New Republic's old site permitted readers to register as users in order to comment on articles and blog posts, which themselves defined by tags and illustrated with graphics. So moving content was more complicated than simply copying over text: Users, taxonomies, image files, and user-to-comment relationships also needed migration. The site also contained information about users' print subscriptions for customer-service purposes… and none of it was documented.

Joel Sackett, Phase 2 Technology's Project Manager, describes what they had to work with. "The old site's data were in five databases, with multiple formats including XML, pure SQL, and SQL Server databases. The data sources themselves weren't very clean or laid out within their original formats, either. So there was no way to perform a simple mass import. Instead, it was an iterative process." Sackett went on to say, "There was a lot of extra logic that we needed to employ to make the migration work. When you get into relationships between users and comments and content in some of these legacy systems, a lot of reverse-engineering is necessary, especially if the data structure isn't ideal."

Headers ("Politics", "Books & Arts", etc.) lead either to specialized blogs or to pages of content defined by taxonomy

Three top stories rotate every few seconds

Secondary stories in manually rotating carousel

Article archives in reverse order by "date featured" (not date published)

Featured content singleton

Rotating ad block (banner at top of page not shown)

Right column features hot content by category

Multimedia block promotes original audio podcasts, video, and slideshows

"Editor's Choice" — a high-impact graphic lead-in

Some of the many ways The New Republic's front page promotes content

25

Technology in the service of content

The New Republic's biggest asset is its content creators, which have included such internationally known luminaries as author Barbara Ehrenreich and cartoonist Matt Groening. So when the publication decided to move to Drupal, it used the opportunity to extend and vary how readers could choose to see that valuable content.

First, the publishers decided to maximize how much content appears "above the fold" — that is, at the top of the screen, before the reader scrolls down. Most obviously, a prominent block at the top of the page rotates among lead-ins to the top three stories, lingering on one when the reader hovers the cursor over it. Mr. Veis noted how this change immediately improved reader experience.

> *"We used to have to give short shrift to important stories sometimes because we simply didn't have space on the page to feature everything. But I love our triple cover... in terms of editorial functionality, that's the best."*

Phase 2 Technology's team implemented this three-story rotation as part of an elegant queue system that was made possible with a combination of custom programming, the Nodequeue module[61], and the Scheduler module[62]. This system allows editors to queue up stories in any order for automatic release at midnight and feature them in any of the site's multiple queues. (Besides the three-story block, the front page also has daily archive, Editor's Choice, and other blocks which feature stories in various, reader-friendly ways.)

Paralleling the development of these back-end technologies, Phase 2 also redesigned the site to The New Republic's specifications. As Mr. Veis said, "The old site had problems both in terms of functionality and aesthetics, so we pushed for a redesign. And we got it! Now you can see seven features on our site without scrolling down. It's been a monster improvement."

An interior page of The New Republic's site, featuring topic-specific blog posts and a automatic ranking of the site's most popular articles

Unseen improvements

The design changes had the biggest impact on the site's appearance. But Veis said the back-end changes were at least as important for his editors. The queueing system offered one unseen advantage: Editors could prepare stories many days in advance, with each day's release having its own queue. Long weekends and editor vacations were now possible without any disruption to the release schedule: Readers had no way of knowing whether an editor had pre-queued the story or rushed it to the site a minute before its release.

61 http://www.drupal.org/project/nodequeue
62 http://drupal.org/project/scheduler

IX. The Wrap-Up

The market for publishing software is historically important. It cemented the Mac's success in 1985 with PageMaker, brought millions of independent content creators to the Web, and is now connecting the world's information in enlightening and unexpected ways. With so much at stake, it's no wonder that so many developers vie for publishers' attention with their products.

The downside of such wealth is confusion. One CMS trumpets that it's "designed to publish magazine websites", but can only point to two independent publications that use it; another runs millions of sites, but lacks essential features that news publishers demand.

We believe that Drupal has the optimal mix of functionality, flexibility, support, and low cost that today's publishers need, and recommend that you consider it in your first cut when selecting a CMS.

Regardless of your decision process, we recommend that for each CMS you're considering, you:

• **Seek out others who use it.** There's no better teacher than experience, and borrowed experience is cheaper than bought.

• **Describe your needs to a consultant who specializes in the CMS in question.** Reputable consultants will be happy to help you explore your needs, and will make frank assessments about what will be necessary to make the switch.

• **Involve your technical staff, content creators, and others who'll use the CMS regularly.** Determine their ability — and desire — to use and maintain whatever technology you choose. Change is always stressful, but it's less so when it leverages existing skills.

• **Consider doing a "trial run" of the CMS in question.** This is much easier with free software such as Drupal, where you can create test sites and subdomains quickly and cheaply, without having to worry about licensing fees.

In choosing a CMS, you're making a long-term decision that affects essential business operations every day. That's an intimidating prospect, but also spells opportunity. Making the right choice, and surrounding yourself with the right support personnel, will pay dividends for years to come.

X. Glossary of Drupal and Online Publishing Technologies

Acquia Drupal: A software package produced by the commercial company Acquia. It includes *core Drupal*, many of Drupal's most-popular *modules*, and some additional modules to integrate your site with Acquia's monitoring, search, and support services.

API: "Application Programming Interface". The specification in a piece of software that describes how other programs can interact with it. Drupal's API is documented at http://api.drupal.org.

Block: In Drupal, a discrete piece of content that can be placed in various regions on the page. This content can be static (such as a passage of text) or dynamic (such as a live stock exchange feed). The number of regions is determined by the site's design, or *theme*.

Calais: A free set of technologies sponsored by Thomson Reuters. Calais uses natural-language processing and artificial intelligence to find meaning in unstructured information. Its output is typically used to group similar information, or find resources that add value to the source information. (Calais is available on Drupal through the Calais module.)

Content Type: A template for content, defined as a group of *fields*. Core Drupal comes with the Page and Story (or Article) content types enabled by default, with two others (Poll and Blog) available but disabled. Some *modules* add further content types, and you can also create your own. An example of a content type is a classified ad, which might have fields for phone number and expiration date. OpenPublish comes with fourteen content types to contain news feeds, multimedia items, collections of related content, and the like.

Core Drupal: The basic, "official" version of Drupal, as defined by its maintainers and made available for download at http://www.drupal.org/project/drupal.

DAMP: The "Acquia Drupal stack installer" is a package that pairs *Acquia Drupal* with an Apache, MySQL and PHP (AMP) technology "stack". DAMP is a simplified way to install all software necessary to run Drupal. Often used by developers when building and testing Drupal sites. Available for Mac and Windows.

Distribution: A software package optimized for a specific application. Distributions combine Drupal with additional modules, themes, and custom programming, and are managed by a unified installer. OpenPublish is a Drupal distribution optimized for publishing, with special features that take advantage of the *semantic web*.

Field: A place for a specific kind of information, for example in a *content type*. For example, a "Newsmaker" content type might include fields for the person's date of birth, position, and organization.

LAMP/WAMP/MAMP: Packages that provide the three pieces of software necessary to support Drupal (and most content management systems). The first letter refers to the operating system it's made for: Linux, Windows, or Mac. The "A" is for the Apache web server; the "M", for the MySQL database server; and the "P", for the PHP programming language.
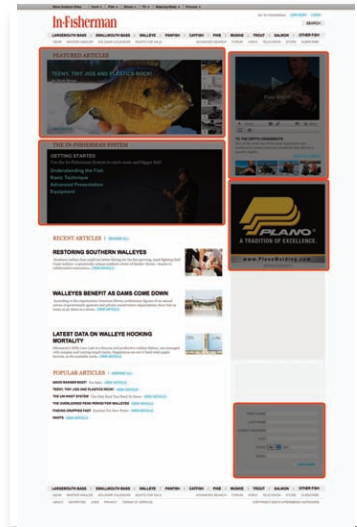
Blocks enhancing a Drupal page layout

28

Module: A software package that extends Drupal's functionality. Developers with knowledge of PHP and Drupal's *API* can write their own modules; a directory of free, open-source modules is at http://www.drupal.org/project/modules.

OpenCalais: The web-services portion of Calais used by Drupal sites.

Node: The main unit of information in Drupal. Nodes are instances of *content types*, which comprises a title, body, other *fields* that you or a module define, and metadata such as whether the node is published. Most typically for publishers, an article is a node of the content type "article" or "story"; an ad could be a node of the content type "ad"; and so forth.

RSS: A standard most often used for exchanging information between web sites. For example, a publisher can use RSS to allow other sites to publish the titles, bylines, and first 100 words of its articles, but require readers to go to its own site for the full content. RSS is built on *XML* and stands for "Really Simple Syndication", although that expansion is almost never used.

Semantic Web: A suite of features that connects content from diverse sources. For example, artificial intelligence can determine which parts of an article are most important and create a package that extends it with maps, links to related stories, and other mentions of people mentioned in the article. On Drupal, *OpenCalais* performs many Semantic Web functions, augmented by such hosted applications as Google Maps.

A stylized version of the RSS logo

Social Publishing: Online publishing that combines the "one-to-many" communication style of traditional newspapers with features of the "many-to-many" style of social networks such as Facebook. A social publishing site typically includes ways for readers to create blog posts, comment on stories, "friend" other readers, and add "tags" that categorize content.

Taxonomy: A system of categorization. In Drupal, taxonomy is defined by Vocabularies (such as "Heads of state") and Terms (such as "U.S. President Obama" and "Dutch Prime Minister Balkenende"). Such terms are applied to *nodes* via "tags"; such nodes can then be grouped and manipulated according to their terms. The *Semantic Web* relies on automatically applied taxonomy to connect far-flung bits of information.

Theme: The CSS, programming, and other files that define the graphic design of a Drupal site. Hundreds of themes are available for free download from http://www.drupal.org/project/themes, or you could buy or design your own.

View: An organization of content in your site, produced by configuring the Views module. For example, let's say you want to feature an easy-to-update list of local restaurants on your site. You would first define a content type called "Local restaurant" that would include establishments' names, locations, hours, and type of food served. You would then create a *node* of that content type for each restaurant. Finally, you would create a *view* that displays those restaurants in a list, or a map, or in a gallery format. The view could let readers see only restaurants serving Thai food, or that are open on Sunday.

XML ("Extensible Markup Language"): A standard for encapsulating content in "metadata" that describes what the content is. XML elements can contain other XML elements in a hierarchy, so that a `<photo>` element might contain both an `<image>` element and a `<caption>` element. One application of XML is *RSS*.