

Business Intelligence

Vol. 7, No. 5

**CUTTER**  
**CONSORTIUM**

# Web and Enterprise 2.0: A Reasoned Perspective

by Vince Kellen

Has the hype around Web 2.0 and Enterprise 2.0 gone too far? Is Web 2.0 revolutionary or evolutionary? Should businesses boldly move forward with Web 2.0 initiatives, or is pausing a sign of healthy skepticism? The economics of information is often counterintuitive. Blindly adopting Web 2.0 techniques without understanding how your organization profits from information may be foolish. This *Executive Report* examines the slippery and paradoxical nature of the information fueling Web 2.0 and takes a harsh look at some of the claims Web 2.0 proponents have made by shedding new light on this debate.

Executive  
Report

# Cutter Business Technology Council



Rob Austin



Ron Blitstein



Tom DeMarco



Christine Davis



Lynne Ellyn



Jim Highsmith



Tim Lister



Lou Mazzucchelli



Ken Orr



Ed Yourdon



## About Cutter Consortium

Cutter Consortium is a unique IT advisory firm, comprising a group of more than 150 internationally recognized experts who have come together to offer content, consulting and training to our clients. These experts are committed to delivering top-level, critical, and objective advice. They have done, and are doing, groundbreaking work in organizations worldwide, helping companies deal with issues in the core areas of software development and agile project management, enterprise architecture, business technology trends and strategies, enterprise risk management, business intelligence, metrics, and sourcing.

Cutter delivers what no other IT research firm can: We give you Access to the Experts. You get practitioners' points of view, derived from hands-on experience with the same critical issues you are facing, not the perspective of a desk-bound analyst who can only make predictions and observations on what's happening in the marketplace. With Cutter Consortium, you get the best practices and lessons learned from the world's leading experts, experts who are implementing these techniques at companies like yours right now.

Cutter's clients are able to tap into its expertise in a variety of formats including print and online advisory services and journals, mentoring, workshops, training, and consulting. And by customizing our information products and training/consulting services, you get the solutions you need, while staying within your budget.

Cutter Consortium's philosophy is that there is no single right solution for all enterprises, or all departments within one enterprise, or even all projects within a department. Cutter believes that the complexity of the business technology issues confronting corporations today demands multiple detailed perspectives from which a company can view its opportunities and risks in order to make the right strategic and tactical decisions. The simplistic pronouncements other analyst firms make do not take into account the unique situation of each organization. This is another reason to present the several sides to each issue: to enable clients to determine the course of action that best fits their unique situation.

**For more information, contact Cutter Consortium at +1 781 648 8700 or [sales@cutter.com](mailto:sales@cutter.com).**

# Web and Enterprise 2.0: A Reasoned Perspective

## BUSINESS INTELLIGENCE ADVISORY SERVICE

Executive Report, Vol. 7, No. 5

---

by **Vince Kellen**

Warfare is often merely ontological.

Rightly or wrongly, Web 2.0 represents one of those paradigm shifts that is predictably precipitating a bit of warfare. People are arguing over how we ought to describe the world. And in every struggle, there are three main participants: protagonists who optimistically push forward, antagonists who skeptically critique the protagonists, and idle bystanders who either dismiss the significance of the entire scuffle or revel in the ensuing mud bath.

Much is at stake in these shifts. The old guard jealously protects the entrenched perspective, weakened as it may be. The vanguard overstates its case, often rewriting history while offering new ideas

filled with faults. Both sides seek to protect personal and economic success. As in all warfare, truth is usually the first casualty.

I believe that most of the current discussions regarding Web 2.0 are in need of reform. The discussions are a bit too simplistic, with authors relying on their personal experience and intuition rather than on a disciplined application of reason. I also believe this is why most firms' reactions to Web 2.0 have been, so far, more like that of uncertain bystanders. We need to clear our minds of jargon. The time is right to begin applying a more reasoned perspective that can guide our efforts.

In the middle of 2007, it appears most corporate enterprises are looking at Web 2.0 with a bit of

bewilderment, if not some detachment. After all, the main participants in Web 2.0 are considerably younger than the executives who must make decisions regarding it. Many CIOs simply don't use technology in quite the same way as teenagers and young adults do and hence are not immersed in the Web 2.0 culture. Thus it follows that the use of Web 2.0 technology within the enterprise (aka Enterprise 2.0) is moving well behind the consumer rush.

Some of this slowness, if not resistance, on behalf of executives may be chalked up to healthy skepticism. Some of the more elaborate and amorphous claims that Web 2.0 will redraw power lines between the center and the edge or that Web 2.0 is some new era of massive democratization

certainly will cause the older and entrenched generation to raise an eyebrow and dismiss the whole affair as the ignorance of youth. This reaction may be, in its own way, wise. But those who “get” Web 2.0 look equally askance at those old fogie naysayers and state, “They just don’t get it.” It’s amazing how powerful, yet vacant, the phrase “they just don’t get it” is.

I look at both groups and say that neither side “gets it.”

For the sake of clarity and for sheer enjoyment, I have conveniently placed the partisans in the Web 2.0 debate into one of two camps: the Panglossians and the Meliorists. Panglossians have unbridled enthusiasm for Web 2.0 and consider it a significant and better step forward. Meliorists dispute these claims and seek intellectual reform. In the Panglossian camp, it is fair to place Chris Anderson, Tim O’Reilly, and Stowe Boyd. In the Meliorist camp, we can count at least Nicholas Carr and Christopher Koch, if not some of the other Cutter authors who have written on the topic. If you’re quick, you will notice the biased asymmetry in this distinction.

As for me, count me more a Meliorist than a Panglossian. Web 2.0 has many things to offer

us, but not all of them are positive. For firms that wish to profit from the changes Web 2.0 brings, blindly following Panglossian prescriptions can be downright foolish. But even some Meliorists are not without stain. Something else is afoot.

I considered titling this work “Web 2.0 Gobbledygook” at first, but, out of respect for my fellow technology enthusiasts, I resisted. As one who personally lived through, profited from, and occasionally tried to restrain the unbridled enthusiasm of Web 1.0, I can’t help but feel a strong sense of *deja vu*. So much irrational exuberance from the first go-around has found new life in this second life.

For those readers who are bemused, skeptical, or inquiring, read on. The purpose of this work is to apply some basic concepts regarding the paradoxical nature of information to reveal what Web 2.0 really is, how it behaves, what its boundaries are, and where I believe Web 2.0 is heading. Hopefully, you will find something that will be more helpful in deciding what your enterprise can do with Web 2.0 than the typical string of platitudes and elided thought found in numerous waypoints along the Internet’s long tail of endless Web sites. For those

readers already “enlightened” and just reading to see where I may trip up, read on as well. Maybe I will delight you in that. But, being a confident realist, I just may convince you of the error of your ways. In any case, at the very least, I humbly hope that we can improve the signal-to-noise ratio here.

This *Executive Report* takes a look at Web 2.0 from a new perspective, specifically regarding the role of information in this new world. The report begins by introducing five dimensions of information and examines how these characteristics affect Web 2.0. It then walks you through the concept of the long tail, also evaluating the role this idea plays in this new arena. The report next broaches the subject of why more information, as Web 2.0 encourages, may not always be a good thing. It concludes with some predictions for the Web 2.0 future.

## UNDERSTANDING INFORMATION

To understand Web 2.0, one must understand the shape of information. Information is paradoxical and slippery. It simply doesn’t behave exactly the way we always think it should. Yet because of the peculiar shape of information, some rather persistent patterns

---

The *Business Intelligence Advisory Service Executive Report* is published by Cutter Consortium, 37 Broadway, Suite 1, Arlington, MA 02474-5552, USA. Client Services: Tel: +1 781 641 9876 or, within North America, +1 800 492 1650; Fax: +1 781 648 1950 or, within North America, +1 800 888 1816; E-mail: [service@cutter.com](mailto:service@cutter.com); Web site: [www.cutter.com](http://www.cutter.com). Group Publisher: Chris Generali, E-mail: [cgeneral@cutter.com](mailto:cgeneral@cutter.com). Managing Editor: Cindy Swain, E-mail: [cswain@cutter.com](mailto:cswain@cutter.com). ISSN: 1540-7403. ©2007 by Cutter Consortium. All rights reserved. Unauthorized reproduction in any form, including photocopying, faxing, and image scanning, is against the law. Reprints make an excellent training tool. For information about reprints and/or back issues, call +1 781 648 8700 or e-mail [service@cutter.com](mailto:service@cutter.com).

of human behavior regarding information continually reappear. We'll see more on this later.

To cut to the chase, this *Executive Report* decomposes information into five dimensions:

1. **Abstraction** — how generic, removed from concrete reality, or high-level the information is
2. **Codification** — how much of the information is assigned known categories or aligned with structured metadata
3. **Diffusion** — how many people possess the information
4. **Affect valence** — the type of emotion (positive or negative) the information carries
5. **Affect intensity** — the intensity of the emotion the information carries

These five components, drawn from peculiar sources in knowledge management and psychology as discussed below, help give information some shape and contour. By understanding the shape of information along these five dimensions, it becomes easier to comprehend what Web 2.0 means and what specifically firms can and can't do to take advantage of Web 2.0.

I am confining my comments to a specific set of authors, including Chris Anderson (author of *The Long Tail* [1], who made the *Time* 100 list of most influential people in 2007); Tim O'Reilly (author [21], book publisher, and host of

the well-known Web 2.0 conference); Nicholas Carr (author of the famous or infamous article "IT Doesn't Matter" [11] and of the Rough Type blog [8-10, 12-14]); Andrew McAfee (associate professor at Harvard University and author of various articles on Enterprise 2.0 [7, 19]); Stowe Boyd (author [6], well-known consultant, and Cutter Consortium Senior Consultant); Chris Koch (blogger [18] and executive editor of *CIO* magazine); along with a few other Cutter Consortium reports on Web 2.0 [16, 20, 24].

To tackle the issues of Web 2.0 raised by this collection of authors, I will be relying on two main sources: Max Boisot and Joseph P. Forgas. Boisot, a consultant and university professor at Oxford, Cambridge, and Wharton, wrote *Knowledge Assets: Securing Competitive Advantage in the Information Economy*, published in 1998 [5]. From this and other Boisot papers [4], I have borrowed the useful concepts of abstraction, codification, and diffusion introduced above. For the purposes of this work, these primary concepts offer the most explanation.

Forgas's edited collection of writings on affect and cognition is titled *Feeling and Thinking: The Role of Affect in Social Cognition* [17]. The collection of works within Forgas's book provides many concepts of value, but two that I find most compelling are affect valence and affect intensity,

the final two dimensions mentioned above. While this book contains several frameworks that appeal more to the student of psychology, the notion that information contains emotional content that can affect how we process information in predictable ways has practicality for us IT folk. Web 2.0 represents a massive blender of information whirling around with a diversity of emotional textures, ranging from positive to negative and from strong to weak. Unsurprisingly, human beings often react differently and predictably to strong negative information and strong positive information. How firms can exploit Web 2.0 may very well depend on the affect valence and affect intensity of the primary information they manage.

Many of the sources discussed above give good definitions of the Web 2.0-related terms. For this report, I focus on the pieces of Web 2.0 shown in Table 1 (the definitions are summarized from Wikipedia). I will leave it to the reader to explore these definitions and examples in more detail.

I will not spend time discussing whether these terms fully or partially define Web 2.0. The works cited above do much better justice to that rather lengthy discussion. For the purposes of this report, I am considering these concepts as the relevant aspects of Web 2.0. My perspective is that Web 2.0 is defined well enough as both a collection of technologies

Table 1 — Definition of Terms

|   |   |
|---|---|
| Blog  | A Web site where entries are written in chronological order and displayed in reverse chronological order. Blogs combine text, images, and links to other blogs and to other Web pages, and visitors can leave comments. I have a blog at <a href="http://advice.cio.com/user/vince-kellen">http://advice.cio.com/user/vince-kellen</a> .                        |
| Wiki  | A Web site that allows visitors to add, remove, and edit content. The ease of interaction and operation makes a wiki an effective tool for mass collaborative authoring. Wikipedia is the most popular example of a wiki.   |
| Rich Internet applications (RIAs)                       | Web applications that have the features and functionality of traditional desktop applications. RIAs transfer user interface processing to the Web client but keep the bulk of the data processing on the server. Google's AJAX technology is a popular RIA technology.  |
| Really Simple Syndication (RSS)                         | RSS is a family of Web feed formats used to publish frequently updated digital content, such as blogs, news, and podcasts. RSS is analogous to a table of contents.   |
| Social networking                                       | A social network is a social structure made up of nodes (individuals or organizations) that are tied together by one or more specific types of relations. MySpace, FaceBook, and LinkedIn are examples of social networking sites.  |
| Social bookmarking, collaborative tagging, folksonomies | Social bookmarking is a way for Internet users to store, classify, share, and search Internet bookmarks. Collaborative tagging is a way for both the creator and the users of content to create metadata about that content. This metadata can be shared and searched. <a href="http://Del.icio.us">Del.icio.us</a> is an example of a social bookmarking site. |
| Mashups   | A mashup is a Web site or application that combines content from many sources into an integrated experience. <a href="http://Netvibes">Netvibes</a> is an example of a mashup.  |
| Democratization   | A term used to describe the ability for anyone to freely publish content on the Web.  |
| The long tail   | Coined by Chris Anderson [1], the long tail describes certain business models that deliver small quantities of many products to small groups of customers.  |
| File sharing  | Sites that let users share photos, videos, documents, and other digital information.  |

and how those technologies are used by and shape social settings.

The first section looks at the first three dimensions introduced earlier: abstraction, codification, and diffusion. The section that follows tackles the remaining two: affect valence and affect intensity.

### ***I-Space Framework***

The I-Space framework is a three-dimensional construct for examining the nature of information and how information flows within firms and markets. In Boisot's framework [4, 5], information

has three dimensions: abstraction, codification, and diffusion. Boisot is quite specific in his definition for these three terms.

For abstraction, he says:

Abstraction establishes the minimum number of categories required to make such assignments meaningful. Where few categories are required, the more abstract our treatment of the phenomenon can be and the larger become the data processing economies on offer. By contrast, the larger the number of categories

required to perform a meaningful assignment, the closer we are to the concrete realities of the natural world.

Codification, on the other hand:

... can be thought of as the creation of categories to which phenomena can be assigned, together with rules of assignment. Well-codified categories are clear categories, and well-codified assignment rules are clear rules. If assignment rules are fuzzy and categories are ambiguous, it will be costly to assign phenomena to categories.

And diffusion is:

... the percentage of data processing agents within a given population of these that can be reached by an item of data per unit of time. Agents may, but need not, be human. A population of firms, for example, could be located along the diffusion dimension, in which case one might well be dealing with an industry.... When all agents can equally access an item of data with the same speed, the data is maximally diffused.

Let's use some examples to make this clear. The term "publication" refers to many things that can be considered a publication, whereas the phrase "The May 1 edition of the *Chicago Tribune*" refers to a specific kind of publication, so specific that it has a physical referent. Publication is the more abstract concept, and the edition of the *Chicago Tribune* is the more concrete.

Codification is also fairly straightforward. Figure 1 is a picture, taken from Wikipedia, of a cat on a mat.

While our eyes can easily see this is a cat on a mat, a computer would not know this unless the information in the picture was assigned some categories. This image is an example of information that is not codified. Figure 2 is a conceptual graph that codifies the semantic information within the picture. Such a graph is easily and unambiguously processed by a computer.

Combining these two forms of data is powerful. The relatively uncodified image when paired with the conceptual graph metadata lets computers more easily classify and search for the image.

The third dimension, diffusion, completes the Boisot I-Space framework. Highly diffused information is available to all. Information not diffused is under lock and key. Security codes giving access to nuclear weapons would not be, we hope, diffused. Proprietary information that a firm relies on for success would not be diffused either. Google's search algorithm, for example, is not highly diffused. As many of us know, Apple's long-term product plans are also not highly diffused. Apple prefers to keep this information close, for strategic reasons.

Information can transform and "flow" in this three-dimensional space (see Figure 3). For example, information critical to a firm often starts in position A in Figure 3 as uncoded, relatively not abstract, and undiffused information. This kind of information is tacit and held within the mind of the



Figure 1 — Cat on a mat image.  
(Source: Wikipedia.)

founder(s) of the firm. Over time, that information gets written down, codified, and abstracted, allowing others to use the information, which is precisely what firms do when they get bigger. In time, the firm may engage in the exchange of this now abstract and codified information with strategic partners, thus diffusing the information somewhat further. That information would now reside in position B in Figure 3. Business-to-business information, such as inventory, logistics, ordering, pricing, contract data, or any information that coordinates shared business processes, occupies this region of the I-Space.

Following Boisot closely, firms can directly use information for profit when the information is in the ordered regime (see Figure 4).

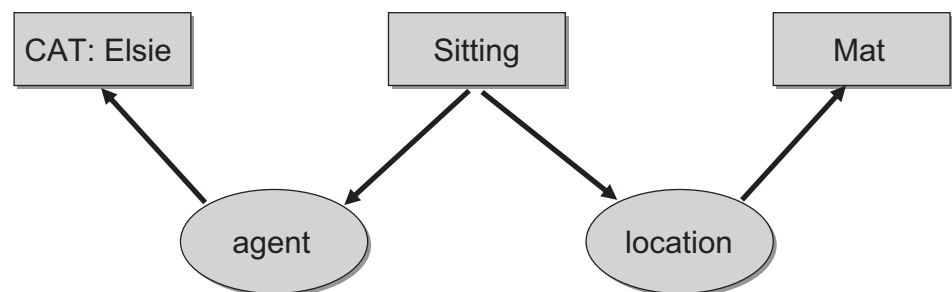


Figure 2 — Cat on a mat conceptual graph.

Information here is more highly codified and abstract. It is more stable and more manageable. Trade secrets, documented algorithms, codified business processes, research and analysis, and strategic contracts with key suppliers and partners are

all forms of information in this ordered regime. This kind of information is usually tightly controlled. This information nearly always lives in the form of documents.

At the other end of the I-Space, the chaotic regime, firms have a harder time leveraging

information that is highly diffused, concrete, and uncoded. Why? Because the ownership of the information may be suspect, it may be too diffuse and thus available to competitors as well, or its uncoded nature may defy automated processing. In other words, the information is too “hot.” The Internet and Web 2.0 is giving rise to all of these problems. For example, as gaming has grown online, eBay has had to suspend the trading of virtual points players earn due to confusion as to exactly what kind of information the virtual points represent, who owns them, and how copyright law may or may not protect ownership of these “virtual” points. Users can search image data, now found in Flickr, YouTube, and many other sites, but only after they or someone tags the images with keywords. Tagging, social bookmarks, and folksonomies are convenient ways to codify what was previously uncoded. In this sense, Web 2.0 and the technologies and social approaches to managing chaotic information are pushing the boundary between the complex regime and the chaotic regime closer and closer to the chaotic minima.

Standing back, some of the key features of Web 2.0 — blogs, wikis, tagging and social bookmarks, and Really Simple Syndication (RSS) news feeds — help improve the manageability of chaotic information. Technology is reducing the size of the chaotic regime somewhat,

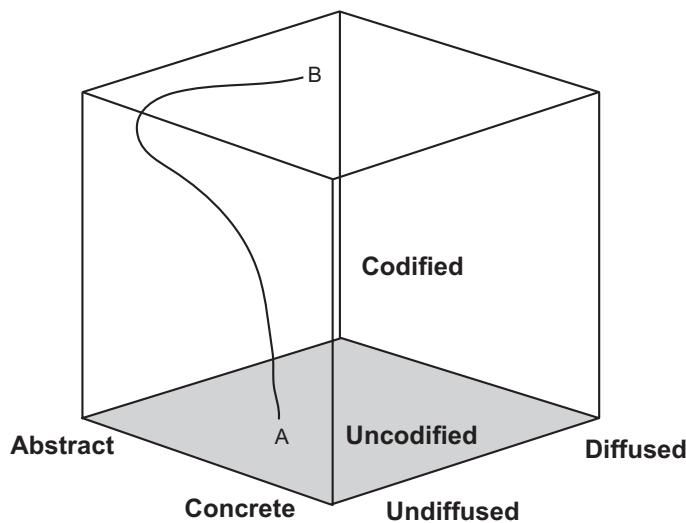


Figure 3 — The Boisot I-Space. (Source: [5].)

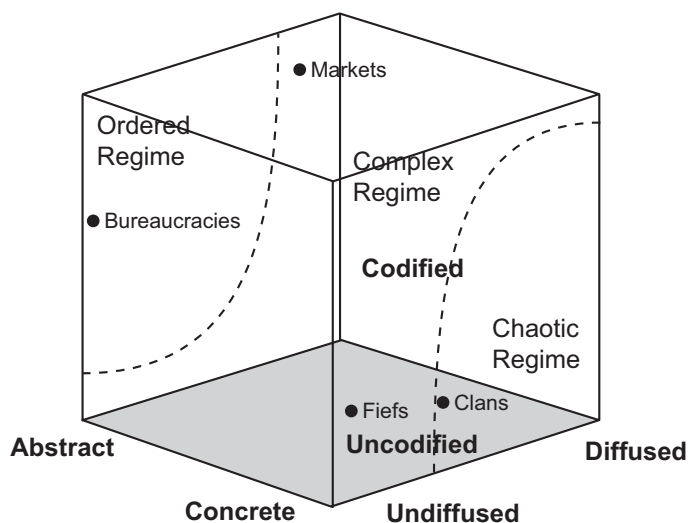


Figure 4 — I-Space and organizational culture. (Source: [5].)



enlarging the range of the complex regime. Technology is pushing the sustainable edge of chaos closer to true chaos.

#### Paradox of Value

Information does not behave like tangible property. It is easily copied and diffused. When highly diffused, competitors can gain access to the same information, at which point the information then has very little value. If Google were to make all the details of its search algorithms available on YouTube along with training materials on how to apply it, Google's competitive advantage is lost. Once revealed, any advantage the search algorithm would provide is lost for any competitor, too. Once the genie is out of the bottle, the firm is powerless to create profits from that information in and of itself. Firms still need to hide or obscure information of some kind in order to generate profit. *Full transparency would kill profits.* Put another way, profits require *some form of information ambiguity or opacity.*

For anyone who has competed based on knowledge, this is utter common sense and reflective of human nature. If I have valuable information my main competitor cannot easily get, I can gain advantage over my competitor. In some cases, it is beneficial for a firm to not know precisely how it maintains an advantage. If it did know, key employees could leave the firm, and the information

would diffuse to the competitor or any number of competitors.

The moral of the story is simple. Information that diffuses widely is, in and of itself, valueless. Firms need some other information to make a profit. The corollary should be equally clear. When information thought valuable is suddenly given away for free, it is because the competitor has found a new source of valuable and probably closely held information.

Google's purchase of YouTube makes perfect sense. YouTube has essentially valueless information that attracts a large number of users. Google has valuable algorithms for linking users to information and, more importantly, a marketing model that links advertising to users. Google has critical proprietary information (search/indexing algorithms) within the ordered regime of Figure 4, which feeds off the valueless YouTube content residing in the chaotic regime. Google was unfazed by the specter of ongoing legal battles over ownership of some of this chaotic content. The prospect of hooking up this much information and these many viewers to advertisers was too tempting. Google, then, requires more valueless information that links together more and more consumers so that its proprietary economic engine can continue to surge ahead. In a way, the Google and YouTube merger was a match made in I-Space heaven.

The rise of social bookmarks, tagging, and folksonomies also makes perfect sense. Web 2.0 has generated an unprecedented amount of unstructured, poorly codified, and nearly valueless information, residing chiefly in or near the chaotic regime of the I-Space. To borrow an overused phrase, here is where Web 2.0 "harnesses the power of collective intelligence." Web 2.0 sites get Internet users to increase the level of codification and perhaps abstraction in this data. How? By tagging it and bookmarking it. While this metadata isn't perfect, it is good enough to help link content to people. The main purpose of this increase in codification and abstraction in the data is equally clear. The linkage between people and tags is of vital interest to advertisers.

In this regard, Google is a nice example of a firm managing the diversity of information. Google relies on the chaotic nature of information in the chaotic regime of the I-Space, but, along with many other sites in Web 2.0, Google has ways of adding enough structure to this data to make it valuable to its true customer: the advertiser. Meliorists look at Web 2.0 and see not much more than a bigger party, with more and more smaller cliques of people, chatting mindlessly about, while more and more insurance salespeople lurk, looking for someone to buy a policy. Here, mindless chatter equals chaotic information, more small cliques

equal smaller groups of Internet users linked through common tags or shared interest in obscure products, and more insurance salespeople equal more advertisers tempting the crowd with offers. Woo hoo! I'm pumped. Are you?

### Information and Organizational Culture

Boisot characterizes four kinds of organizational cultures in terms of how the organization manages information. These archetypes are: the fief, the clan, the bureaucracy, and the market. Each of these culture types sits in a different location in the I-Space (see Figure 4). Fiefs revolve around one or a few individuals who share uncodified and concrete information whose diffusion is limited by a preference for and a reliance on face-to-face communication. Human relationships are personal and hierarchical, often driven by a charismatic leader. The startup is often an example of a fief. Clans are more egalitarian. Information is still uncodified and concrete and is shared mostly through face-to-face interactions. Information is spread horizontally through negotiation. Relationships are personal but nonhierarchical. Bureaucracies begin to codify and abstract the information shared. Diffusion, now chiefly through documents, is still limited and controlled. Relationships are impersonal and hierarchical. Markets are similar to bureaucracies in that information is codified and abstracted but now

the information is widely diffused and nearly always digital. Relationships between agents (people or organizations) are nonhierarchical and competitive.

Firms evolve organizations in response to the nature of the key knowledge that part of the firm manages. Small firms probably have one dominant culture type. Large firms may have different culture types depending on the business unit and the nature of the information within that unit. To glean new knowledge, firms need to ensure relevant information flows throughout the enterprise. This requires information to flow between these various business units and their attendant cultures with some fidelity. Boisot calls this flow of information between the various regions and cultures in the I-Space the social learning cycle (SLC). The SLC does not need to reside entirely within a firm. In fact, most firms need to share information with suppliers, partners, and even competitors, so an entire market can be engaged in a rather large SLC. The speed at which this information flows needs to match the competitive environment. Slow-moving markets do not need fast-moving, firm-specific (or industry-level) SLCs. Fast-moving markets usually require fast-moving, firm-specific, if not industry-level, SLCs.

As you can now see, getting information to flow across an SLC has some challenges. Different culture

types can impede or distort information flow. As the level of codification and abstraction raises or lowers, the fidelity of the information may vary. While specific cultures evolve to more effectively manage the information in that region of the I-Space, communication between those cultures can become more difficult.

Perhaps the most significant feature of Web 2.0 is that it has created, through blogs, social networks, and file sharing, an enormous amount of data in or near the chaotic regime. Bureaucratic or even market cultures are ill-equipped to deal with this kind of data en masse. In fact, with regard to its key revenue model, Google itself only manages this chaotic data by applying information in the bureaucratic region of the I-Space (its proprietary algorithms) and by leveraging social tagging to help codify and abstract the information. The end result is that, by design or by accident, Google has an effective SLC in which relevant information flows from the lower, chaotic region of the I-Space (the nearly profitless region) to the upper, more ordered region (where profits can be extracted). Again, as you can see, the YouTube acquisition makes great sense. Google gets to apply core knowledge in its ordered regime of the I-Space, easily absorbing new information from the chaotic regime of the I-Space, thus delivering more diverse information products to more customers.

For firms wishing to take advantage of Web 2.0, simply firing up blogs, wikis, RSS feeds, and other tools that can manage the more chaotic information will probably do little unless the firm first maps out how information flows through the firm. Through what subcultures does the information flow? How does the firm extract profit from the information? Does the firm have the right culture or subcultures to manage the information at the various points in the SLC? We have all witnessed the mangling of information as it passes through various units and subcultures in the firm. Units that do well with concrete, uncodified data may not be in a position to incorporate the more formal and abstract analysis produced elsewhere in the firm and vice versa. The technical tools applied need to match the shape of information at that point in the SLC.

Since mapping this out can be difficult, I expect that firms applying Web 2.0 in any capacity, with its customers or inside its four walls (Enterprise 2.0), will run into low probabilities of convincing success. As is usually the case, early adopters will run into failures, and it will take time for firms to learn how to correctly manipulate three key variables for a good fit: the technology itself, the firm's information value chain (its SLC), and the firm's cultures.

Panglossians, so far, have glossed over all these messy details and inconvenient truths, which I

believe are not only essential to manage for success, but may actually be key factors predicting failure. What firms will find out is that the actual situations where Web 2.0 technologies may truly make business sense may be far less in number than the Panglossians seem to claim.

### **Emotion and Information**

Mainstream media and Web 2.0 media are two ships passing in the night. Earlier this year, *USA Today* launched a new version of its site that lets readers post comments, make recommendations, and view the most popular news items. MySpace has also launched a news service with Web 2.0 interactivity. Looking a little deeper, I suspect that *USA Today* and probably more so MySpace are having difficulties encouraging participation in news. MySpace's news page appears to be a ghost town [3]. *USA Today* seems to be faring better. A review of the site in May 2007 showed the top eight stories on its home page with 5, 0, 7, 36, 25, 61, 178, and 82 comments.

Based on this level of feedback, someone from another planet would quickly conclude that *USA Today* is a small town newspaper. Granted, it is not clear how much editing *USA Today* has done on the comments. The editors may be deliberately trying to make their front page look like it serves a small community of readers. Whatever the strategy, relative to most firms and even other media companies, *USA Today* represents

a high-water mark for the type of participation it can garner.

Is something else going on here? I believe so. How people process information also depends on their mood and emotions. Their mood can be set in many different ways, but one way is that information itself carries emotional context. From a mood perspective, there is a big difference between reading news and sharing family photos.

Researchers have been studying the relationship between feeling and thinking for some time [17]. Affect can refer to mood, which is a diffuse, low-intensity, and relatively enduring emotional state with no salient cause, and to emotions, which are short-lived and intense states that typically have a clear cause. Affect is also processed independent of cognition or thinking. We usually exhibit physiological and neurological signs of emotional engagement before we are consciously aware of the information or the emotional state. Affect is intertwined with cognition in that we do become aware of our emotional states and can alter the way we process information based on the knowledge of our emotional state.

Affect (mood and emotions) can be spread along a continuum from "good" to "bad" (affect valence). Positive affect signifies that "all is well with the world," and negative affect signifies that something is wrong. Affect can have varying levels of intensity

from low to high (see Figure 5). Our information-processing strategies vary considerably depending on the affective context. The information in Web 2.0 contains affective content, thus potentially triggering affective responses in users. The differences in our processing strategies may explain why certain sites and content trigger comments and others do not.

#### Different Emotions, Different Site Usage

Positive affect facilitates users' cognitive involvement with the information. Negative affect tends to produce a more inductive and externally focused approach. In other words, when we feel "all is right with the world" we are more likely to use our own knowledge to process information, to trust our own instincts and use faster heuristics to process information, and to engage in unusual,

unorthodox, or creative thinking. Negative affect suggests that the situation is difficult or problematic, resulting in us being more likely to focus externally, in a more piecemeal manner, using cognitive strategies that are less creative or unusual.

Both the affect valence (its goodness or badness) and the affect intensity are triggered by information itself as well as by factors not contained within the information, such as the person's current affective state and other contextual factors (physical location, time of day, and so on). Despite this complexity, information does convey a range of affect, from positive to negative and from low to high intensity. With Web 2.0, we have more information of all affective stripes.

News content is a curious kind of information. Most news content,

especially the most sensational and widely read news, contains strong negative affect. The closer to home the information is, the greater the emotional intensity. The most intense form of negative news (nearby murder, war, crimes, disasters) will tend to generate piecemeal, externally focused processing strategies. MySpace as a social networking site has the opposite affective content. For many users, their spaces are positive reflections of who they are. Their sites demonstrate the user-generated, creative, and unorthodox approaches to information processing they employ.

The I-Space framework may intersect with these two affect dimensions (valence and intensity). I will suggest that when complex information contains certain affective qualities, interactivity increases and differentiates. Complex information is information that contains both higher levels of abstraction and codification, either directly in the information itself or as such that it can be constructed by people through interaction with the information. For example, a photo on a file sharing site is uncoded and concrete, but as users begin to tag the photo, the new bundle of information increases its level of codification a bit. Many forms of more complex tacit knowledge work in a similar manner. We start the conversation simply and elaborate over time, adding codification and elevating abstraction. If I am a golf

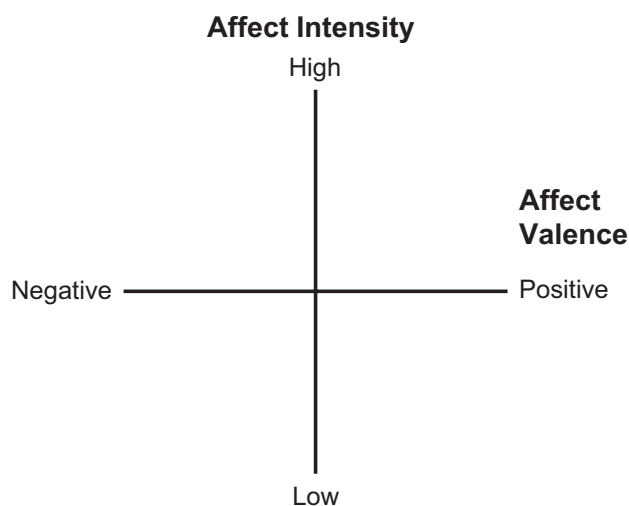


Figure 5 — Affect valence and intensity.

professional with deep expertise on how to swing a golf club, I may have within my knowledge many levels of codification and abstraction of a golf swing. When I choose to communicate with novices about the golf swing, I will need to start with simpler — more concrete and less abstract — terms until the golfer can begin to absorb more complex information. Over time, our communication becomes more efficient but also more abstract and highly codified. Computer experts who speak in a fast stream of acronyms are communicating highly codified and abstract information.

It may be that deeper interactivity increases when information is complex and affect intensity is moderate to high. Web sites that will experience this kind of deep interactivity would include medical sites where users may have a deeper emotional trigger such as experience with a disease; sites for those who play sports and who want to improve their performance; or any site where users feel a need to engage in deeper learning due to stronger emotional triggers regarding the subject matter. If the information's affective content is negative (meaning "something isn't right"), the user's information processing would be more sensitive to external information — more rigid and less creative. Users would be seeking the most expedient means to collect the information to satisfy their needs. Users would

also be less prone to superficial, heuristic, and biased processing since they would invest more energy in verifying the information. If the information's affective content is positive (meaning "all is well with the world"), the user's information processing strategy will be more sensitive to his or her own internal ideas and thought processes — more creative, faster, and more heuristic in nature and thus subject to bias. In this affective state, users don't feel the need to engage the data further because "all is right with the world" and their own heuristic processing looks sufficient. If nothing seems wrong, why spend the time proving it isn't?

I will propose that perhaps superficial interactivity increases when the information is less complex and affect intensity is moderate to high. Simple content with strong negative affective qualities ("Gas prices double!") would generate simpler comments. Simple content with strong positive affective qualities might also generate simpler comments. Information with moderate to low levels of affective quality will likely generate the least number of responses.

#### Emotional Conclusions

This leads to some common sense conclusions. Firms wishing to engage audiences in deeper interactivity have to get a handle on the affective qualities of their information. Complex information (information that is capable of

high levels of codification and abstraction) that has higher affective intensity will generate the deepest interactions. Strong negative affect will encourage people to search the data in front of them deeply (bottom-up processing). Positive affect will encourage people to creatively apply their insights (top-down processing).

MySpace and news content may be a match made in affect hell. Typical MySpace content is moderately positive in affect and is produced as a result of the creative, unorthodox, and user-generated processing discussed above. Most news content, being negative in nature, simply won't be responded to by MySpace users. They have different things on their mind and different information processing strategies at work. News content works best when the overall context encourages bottom-up strategies. Perhaps *USA Today* stands a better chance of generating user feedback than MySpace because users don't need to switch between bottom-up and top-down processing strategies. A dominant processing style is already in play. And as I am hypothetically predicting, since *USA Today* presents information in relatively simpler forms, it will tend to generate simple responses to highly negative information. A medical site on a specific disease, due to the very complex nature of the information, will generate deeper interactivity, again fueled by mostly strong but negative —

but in some cases positive — affect.

Applying this inside a firm is tricky, usually because affect (emotion and mood) is simply not examined as part of the knowledge management discipline. I predict firms will not make much headway on applying deeper forms of interactivity unless the firm engages affect appropriately. Organizationally, there are many ways to go about this, which are too numerous to discuss here. A short list includes looking at compensation and motivational systems, having organizational structures that support the flow of affective information, and understanding employees' personal goals and life plans, as well as sources of deeper emotional involvement.

### **Implications of the Long Tail**

According to Wikipedia, the long tail is the colloquial name for a long-known feature of statistical distributions (for example, Pareto distributions, named for Italian economist Vilfredo Pareto who originally used this distribution to describe the allocation of wealth among individuals since it seemed to show rather well the way that a larger portion of the wealth of any society is owned by a smaller percentage of the people in that society). Researchers in various disciplines have discovered many phenomena that are reasonably expressed as Pareto distributions such as the size of cities, frequency of word distributions, and file sizes.

As used by Anderson [1], the long tail refers to a long tail of products. The meaning behind the long tail is quite simple: Many

companies have an uneven distribution of profits or sales from their products. The sales or profits follow a Pareto distribution (see Figure 6) in which a few products command the largest share of the overall revenue or profits. While this, by itself, is hardly a new idea, Anderson pointed out that new forms of product distribution, especially digital distribution, allow firms to efficiently sell small volumes of more products. This generates a reasonable amount of overall profit from niche products. For some firms, the long tail now becomes an interesting economic proposition.

Interestingly, for many firms, the distribution of customer profits is also a Pareto distribution and mimics the long tail of production in many regards. In 2002, I analyzed customer profitability for a discrete manufacturer across several different product lines to discover a persistent pattern (see Figure 7). A few customers represented the lion's share of the overall firm profits. The vast majority of customers produced few or no profits.

In the distribution of profits, however, some customers (and products) produce a loss, causing the end of the tail to "drag." The logic of the long tail suggests that firms should use technology to lower distribution and/or customer servicing costs so that more customers can be effectively served and more products can be produced, thus increasing the total

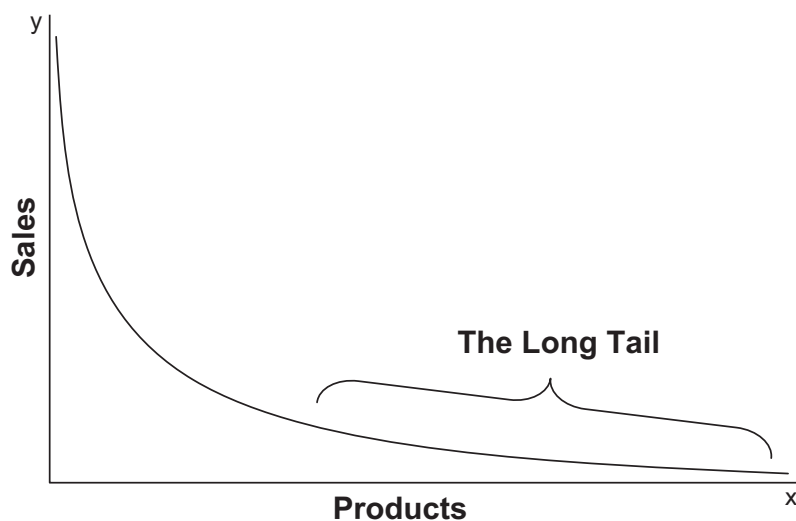


Figure 6 — The long tail.

profits generated. Web 2.0 and information technology may provide a way to effectively lower the costs of production and consumption (see Figure 8).

If firms can lengthen the tail by taking on more customers (or more products), the result is a collection of smaller customer/product niches. The flexible manufacturing push in the 1980s and the customer relationship management (CRM) focus in the late 1990s stressed the need for firms to be able to mass-customize products and services, which many firms did in fact do. The long tail extends this notion even further. Through digital or more efficient forms of product distribution, firms can lengthen the tail.

In theory, this sounds nice. But the long tail has some problems associated with it. As stated above, to profitably service a longer tail, firms need to reduce costs somehow, and there are a couple of ways to do this. One way is to use economies of scale; firms can become bigger to apportion overall costs across a larger customer base. Another way is to drastically lower the unit cost of the product to be produced. We are seeing long-tail Web 2.0 companies do both. For example, YouTube gets customers to “give away” the “product,” ensuring the video consumed has no production cost for which YouTube must foot the bill. Google then buys YouTube to leverage its technology across a larger population of consumers.

However, as the “product” lowers in cost, so do the barriers to entry for competitors, which is perhaps one of the reasons Google purchased YouTube. By increasing its scale, Google is erecting a significant barrier to entry for other firms. Competitors will need a large checkbook to buy the long-tail customers away from Google. Any way you slice it, the logic of the long tail suggests that firms will require scale to ensure their tail can remain long.

A deep feature of the long tail of both production (products) and consumption (customers) is the notion of fragmentation. The right end of the long tail contains collections of small product/customer niches that might not know much about each other. Those few people who buy unpopular products do not represent, except in aggregate, much power. In many firms, the top customers carry power with their supplier. For an oligarchic or tyrannical power, fragmentation is a

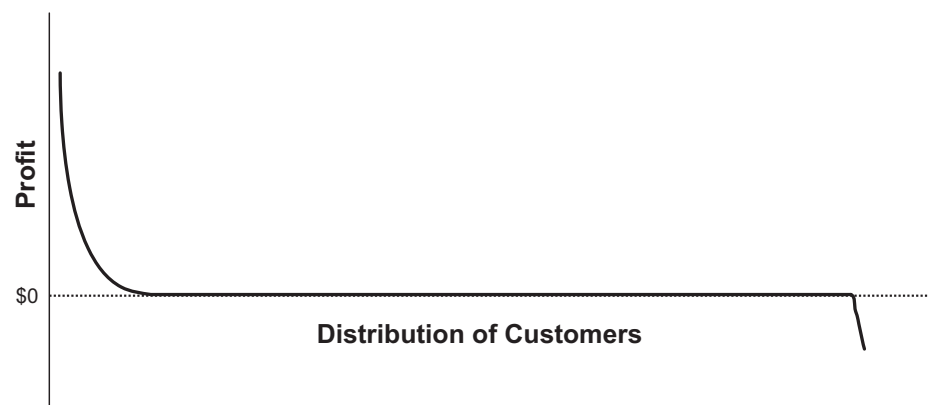


Figure 7 — The long tail of customer profits.

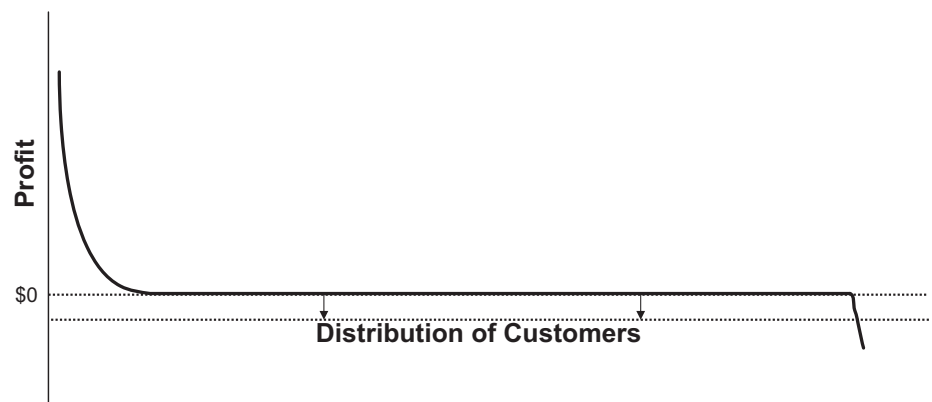


Figure 8 — Lowering costs in the long tail.

good thing. It helps them control the people. If the right end of the tail can't effectively organize or gang up together, the controlling firm can ensure a stable source of profits. Those customers at the edge (the right end of the tail) do not have the same power that those at the center (the left side of the tail) have. Should a collection of customers, aggregated by any other firm arise, Google or other competitors will feel the need to acquire them to prevent relative diminishment of their own tail. In fact, we are seeing this in 2007. Various media companies are buying potential competitors in a race to get big.

It is true that those customers at the edge or the tail can easily switch. Since their loyalty is economically small, competitors can and probably will find ways of attracting them. While the long tail of production and consumption might be desirable from a profit perspective, are these defensible profits? What barriers can firms erect to prevent competitors from picking off customers at the edge? I see few barriers except for scale and proprietary technology, which go hand in hand.

Where Panglossians see a cornucopia of plenty, Meliorists see the need for scale and cost barriers to protect the long tail. Following the research of Erik Brynjolfsson et al [7] on turbulence in IT-intensive industries, I see increased fighting for pieces of the long tail by fewer and fewer competitors who will

leapfrog each other quickly until a near-monopolistic threshold is reached. While the Panglossians may cringe and cry foul, I believe the long tail may be sowing the seeds for the next monopoly or, worse still, duopoly.

For firms seeking to create their own long tail of customers or products, a competitive analysis is in order. How defensible are these customers? Or, what competitor (aka a potential mergers-and-acquisitions suitor) would find value in purchasing these customers? Can Web 2.0 principles and technologies effectively lower costs? Or is the physical nature of your core offering unsuitable for long-tail economics? Existing forms of competitive analysis will suffice. Web 2.0 does not fundamentally alter the strategic analysis requiring a paradigm shift in thinking about strategy.

#### ***Democratization and the Long Tail***

Perhaps the buzzword of the year, democratization is the biggest casualty of this war. Anderson is quite optimistic on the power of the long tail to democratize the tools of production. The Panglossian perspective suggests that people can now produce their own content, unfiltered and free from the control of information gatekeepers such as the mainstream media. Since the world is connected and can discuss things via the Web unfiltered, the world will become a smarter place. Because of the

long tail and its democratization of the tools of production, Web 2.0, unlike Web 1.0, is participatory. Since Web 2.0 supports individuals who can freely write their words and place them in venues where others can find them, Web 2.0, like American capitalism, is individualistic and beneficial.

I have not yet found a complete Meliorist comment on this, although Carr's blog posts [8-10, 12-14] touch on this idea. Perhaps what follows may suffice.

I remember a promotional poster for the science fiction movie *Alien* that stated, "In space, no one can hear you scream." I wonder if it matters at all, statistically speaking, if one empties a small cup of words in an infinite ocean of them. Put another way, adding more information without increasing the available amount of time for human beings to absorb this information reduces the chance the information may have any effect. In economic terms, the rapid growth of the supply of information ought to drastically reduce its value, since substitutes and competitors abound. While people may feel good that they have the power of the pen, economically speaking, their fate in aggregate is no better due to Web 2.0. Just because everyone can speak does not mean people can hear. Quite the contrary, as the louder the party, the less anyone hears. The problem with information is not in producing it, since we can do that abundantly, but in



getting it consumed. One can lead a horse to water, but one has to compel the water to leap down the horse's throat.

Ironically, I contend that what Anderson calls the "democratization" of production would be more accurately labeled as the encouragement of still more consumption. Why? Consider the typical economic transaction between two people. One person is the seller, and one person is the buyer. The seller offers the buyer something of value, and the buyer gives the seller something equal in value, usually cash. Let's examine the typical Web 2.0 exchange in YouTube. I have a video of my cat on a mat that I think is neat, and it would give me great satisfaction to have the world see it. YouTube has something to offer me. It has the disk space and the connection to a network of Internet users who might wish to view my video. I surrender my file to YouTube without compensation. In exchange, YouTube uses my content as part of its advertising model. What have I produced? What have I consumed?

### **When Production Becomes Consumption**

In this economic exchange, I have consumed the satisfaction of publishing a video. What have I paid in return? I have purchased a video camera, a computer, and an Internet connection and have agreed (mostly) to watch advertisements and occasionally buy something as a result of seeing

the advertisement. Not a bad deal, especially for the camera manufacturer, the computer maker, and the Internet service provider. And a good deal for YouTube. Incidentally, so long as my video doesn't become too famous, I won't complain either. The deal is pretty good for me. What Panglossians call "production," Meliorists can call "consumption." When one analyzes the transaction as one of consumption, the term "democratization" loses its relevancy.

While Panglossians tout the democratic nature of Web 2.0, the production of Web content is acutely Pareto-distributed. Surprisingly few people produce and astonishingly large amount of content [13]. If Web 2.0 is participatory, it is a Pareto distribution of participation. Voting, despite its low turnouts in various parts of the world, is far more participatory than the participatory Web 2.0.

The Meliorist tree may bear more fruit here. Firms can mostly ignore Web 2.0's so-called democratization effect as treacle. Smart firms will recognize that the need to produce content, while espoused by many, is acted on by few. Firms with a very large base of customers may be able to induce enough customers to produce content for free (essentially valueless content) for which that content can be mined for residual and indirect value assuming, of course, that they will be able to

construct an SLC to extract profit. But because of the Pareto distribution of content production, many firms may have an insufficient supply of customers. This is another way of saying that Web 2.0 requires intermediaries with the scale to access a rather large number of customers. In Web 2.0, it pays better to be bigger.

For Enterprise 2.0, firms may have serious difficulty in getting enough employees to participate in content production to achieve a critical mass of participation. The type of culture and the nature of the information in the I-Space matter. Knowledge effectively managed in tacit form via face-to-face conversations may never find its way to digital form simply because it is inefficient to do so. The most valuable knowledge is often locked up in the busiest of people [9]. Other barriers, such as individual and organizational defensiveness, which are endemic to the human condition [2], may prevent the use or diffusion of information no matter how codified, abstract, and pertinent. Blogs, wikis, and other authoring tools could wind up as shelfware unless firms address those organizational barriers to information flow.

The cautionary note is that firms do have to pay attention to what customers say in Web 2.0. While the long tail is mostly fragmented, bad (and good) information can spread rapidly. Emotion and bias can create situations where information spreads more quickly

than ever before. While firms may not directly engage Web 2.0 approaches with their customers and within their enterprise, they must attend to those entities that do engage Web 2.0 technologies to talk about the firm and its products. Due to the rise of social networking sites and the blogosphere, perhaps we will see these approaches for communication become the new mainstream media [23]. If so, all firms will be participating in these aspects of Web 2.0.

### **MORE INFORMATION IS NOT ALWAYS BETTER**

There is little doubt that Web 2.0 has given rise to a greater quantity of information, mostly of the uncodified, concrete, and highly diffuse kind (in the chaotic regime). There is also little doubt that effectively managing this information requires some codification and abstraction. Web 2.0 has advanced due to tagging, social bookmarks, RSS feeds, and other approaches, which add codification and abstraction to the information.

Even with increased levels of codification and abstraction, information is growing at a much faster rate than human beings can possibly absorb. We can only read during waking hours, which are not increasing dramatically. Even if smarter systems could filter or abstract the information so that there is less of it to process, I doubt this would make a dent in the overall gap between available

information and decision-making ability.

What this leads to is the need for people (and firms) to economize and incorporate a tiny subset of the available information into their decisions. Thus, a greater supply of information actually increases the probability that any two individuals (or firms) will be making decisions from different subsets of data. In most cases, due to competition, maintaining differences in models incorporated is highly desirable (“the competitor just doesn’t get it!”). While increased transparency creates increased information, the need for competitive advantage and the need to economize and select a tiny subset of information suggest that more information is actually *destabilizing*. Despite easy access to the same highly diffused information, with Web 2.0, individuals, firms, and cultures are more likely to have very different models that guide their actions, not more similar models. And this has the potential to create not only competitive opportunity but unnecessary conflict.

Panglossians again see a cornucopia of plenty where more information is beneficial. Because of their self-generated, top-down, positive affective context, perhaps Panglossians are likely to engage more superficial heuristic processing that overlooks some of these negative details. Or perhaps due to Meliorists’ general foul mood, they tend to look for these

details. I’ll leave it to the reader to decide.

Since Web 2.0 increases the speed at which information diffuses, and because different models of action will create more variance or “noise” in the market, I contend that Web 2.0 is doing two things: it is expanding the overall size of the complex regime (shrinking the size of the chaotic regime), and it is accelerating the pace of learning (SLCs). This has the effect of allowing markets to live with increased speed or turbulence. Figure 9 depicts this relationship between ordered and chaotic environments. It is as if information desires complexity and shuns order or chaos.

Environments that have complete order have information that is simple, can be easily incorporated into decisions, and is available to all instantly. In this environment, information has little competitive advantage. Since all parties can easily incorporate it simultaneously, no party has the edge. In today’s world, these kinds of environments do not exist, or if they do, they are rare. As soon as any information advantage is found, competitors begin to use it, adding complexity and variety to their models for action, matching the variety in the market. At the other end of the extreme are environments that have too much information that is utterly ambiguous, that if any agent did incorporate the information into a decision, the probability of

success would be no different than pure chance. In these environments, information has little advantage as well. In fact, people caught in these environments collectively begin to do things to stabilize the information by simplifying their strategies. In a sense, the market cools down and more predictable patterns begin to emerge.

### Competing for Gold

A thought experiment may help. Imagine a perfectly square large room, well lit with a pile of gold bars in the center. Imagine that you are in one corner of the room and another person, a competitor, is in the opposite corner of the room. The gold is exactly equidistant between you and the competitor. The goal of the game is to get the gold before the competitor does. The rules are simple. A bell will chime every other second, and you and the competitor are allowed to take a step of exactly one meter (no more, no less) in any direction. There is no hidden information. Both you and the competitor are equally aware of the rules and conditions and equally aware of what the best strategy will be.

This is the land of full transparency. The relevant information in the environment is simple and stable. If any new information were added (such as, "OK, both competitors can now take stride lengths of 1.5 meters"), that information would be available to you and the competitor at the same

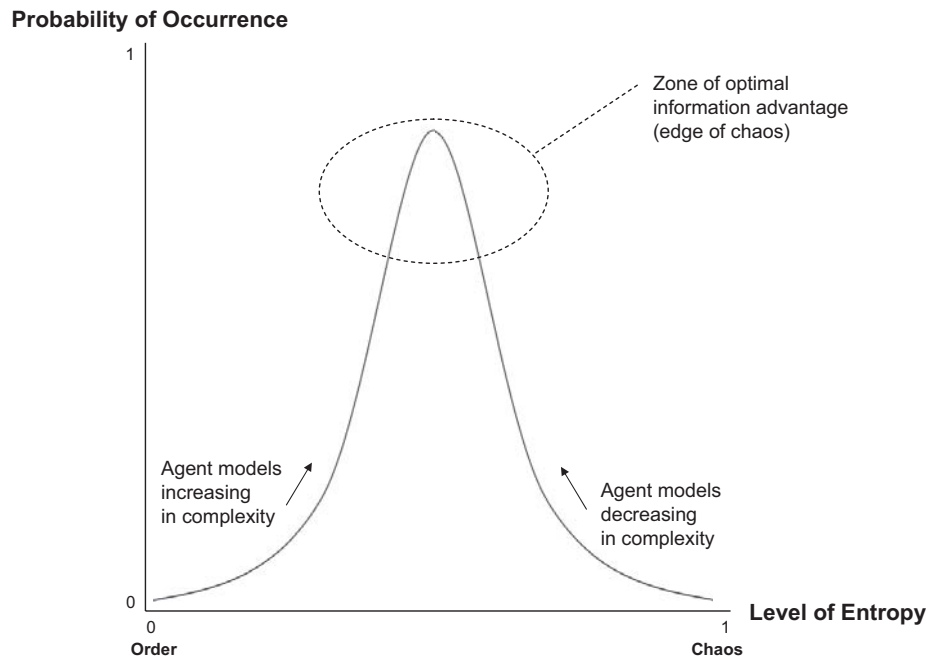


Figure 9 — Edge of chaos and optimal information advantage.

time. Neither of you would have an advantage, and both of you would know that. Extra information does not yield any competitive advantage.

Now consider the opposite. It's the same room, the same competitors, and the same gold, except that the room is dark and you cannot see or hear anything. The gold is moving randomly about the room. There are no rules about stride length. What do you do? What happens when more information is added to this game, such as "OK, both competitors must not run about," or the people controlling the game whispered in your ear, "Your opponent can't walk fast." What do you do with the extra information? Since everything is moving about, any additional

information won't help. Any planned action is as good as random action.

Information then works best somewhere between the land of pure order and pure chaos. Because Web 2.0 tames chaotic data through user-generated and machine-generated codification, it "shortens" the distance between these two zones (by making the bell curve in Figure 9 steeper), or as I have previously stated, increases the size of the complex regime relative to the chaotic (and ordered) regime. What does this mean? Web 2.0 may very well contribute to faster oscillations between nearly chaotic and mostly ordered states. Web 2.0 enables a faster and more destabilizing flow of information.

Figures 10 and 11 depict this “turbulence.”

Web 2.0 is not solely responsible for this. Information technology has been contributing to these faster transients between states for some time. Web 2.0 merely continues and accelerates the potential rate of change.

The conclusion is stark. Companies need to figure out ways of more rapidly absorbing

information, not shunning it. Companies probably need to figure out more quickly what new knowledge will generate the next stream of profits. Profit streams may have shorter life spans. Web 2.0 approaches can be great tools for absorbing new information, or at the very least getting information captured in computer form, provided all the challenges (which are by no means small) that I have discussed so far and more

that I have not are addressed. If corporate cultures can be designed to increase use of information, Web 2.0 technology such as blogs and wikis seem to hold the most promise. They might make it easier for firms to motivate customers and employees to participate and for firms to measure effectiveness. Regardless, the genie is out of the bottle. We must find ways of surfing bigger waves. Web 2.0 is likely to increase turbulence in markets, not decrease it. As many competing firms make simultaneous IT investments in Web 2.0 approaches, competition between firms may heat up [7]. Not entering the Web 2.0 game, despite its difficulties, may be worse than cleverly using a limited subset of Web 2.0 techniques.

I suspect that both Panglossians and Meliorists are sympathetic to the view that Web 2.0 IT has potential here. Meliorists, however, would be prone to exploring the limits of the approach. Since

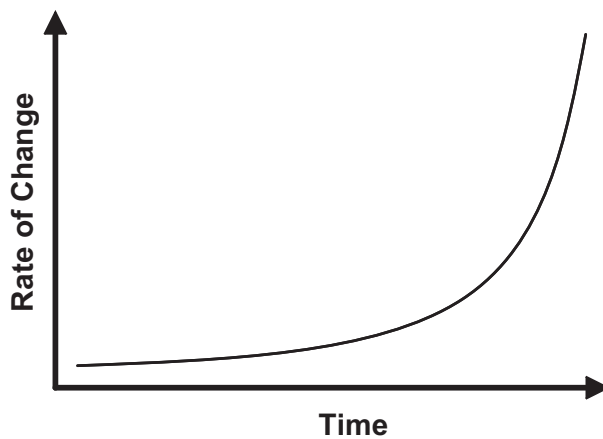


Figure 10 — Rate of change over time.

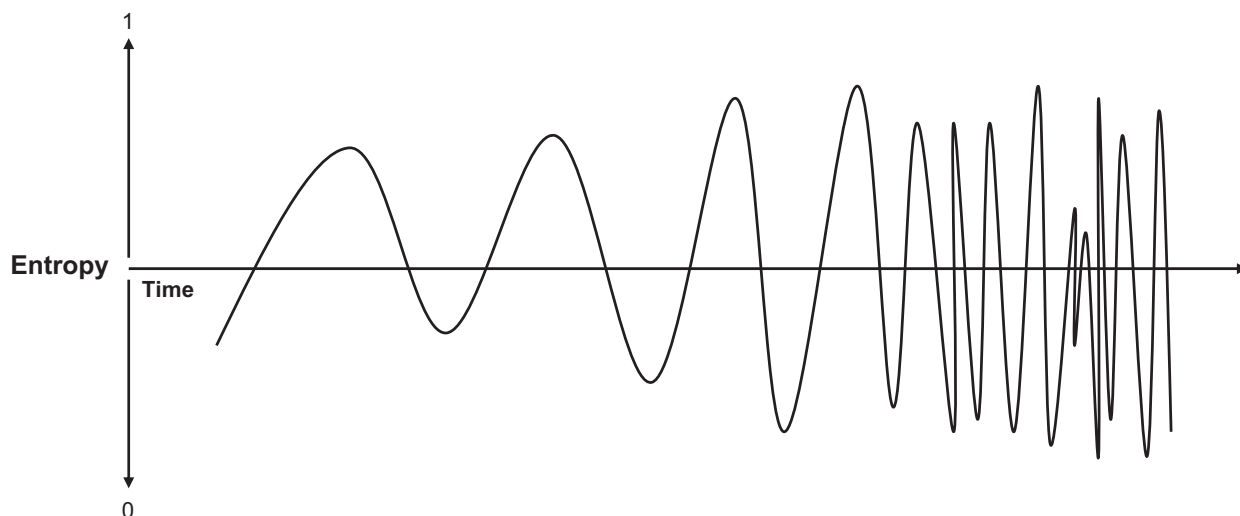


Figure 11 — Faster transients over time.

human technology has changed so drastically in 2,000-plus years and human culture has changed so little, I find myself sympathetic to the Meliorist view. We may have reached the point where technology is seriously challenging cultures to change. Time will tell.

### **Psychological Concerns**

Exploiting information for advantage requires high levels of human expertise. Expertise takes time and a sustained effort to develop. In studies of what differentiates experts from nonexperts, one thing is clear. Experts sustain longer and harder hours of practice in which they continually learn and relearn their domain area. They do so far more frequently, expending more effort. A study that observed ice skaters aids in understanding this idea. Researchers noted that the elite ice skaters fell as frequently as the next tier of ice skaters. The difference is that the elite skaters continually attempted harder techniques. Continued involvement in a field, even for 20 years, does not an expert make. Causal or even not-so-casual involvement in a field does not ensure that expertise will follow. Sustained effort, often for 10 to 20 years, is required [15].

In this regard, the difference between excellence and obsession is rather thin. But what creates high levels of expertise is the willingness to engage in long hours of sustained mental (or physical) effort. How do you get

people motivated in pursuing a long-term and often abstract goal? How do we create more of this deep psychological motivation so that we can continue to develop the experts of tomorrow? In the 21st century, these answers still elude us.

Experts also possess superior heuristic processing. They can make fast, intuitive, “blink-like” judgments that are superior to nonexpert judgments. To absorb information quickly and apply it accurately, firms need more of these experts. Unfortunately, Web 2.0, with its high interrupt-driven, instant gratification, rich Internet application (RIA)-powered user interfaces, may be creating a context that destroys expertise before it can develop. Expertise development requires dedicated, uninterrupted time on a complex task so that a human mind can learn how to codify, abstract, and then relate disparate pieces of complex information. It frequently requires other human mentors.

We will not “media munch” our way to expertise. We will not blink our way to expertise. Web 2.0, as it is constructed now, will not help.

Panglossians may claim that expertise development can occur in machines, relieving humans of the burden. The cynical side of me often wonders if all of Web 2.0 isn’t some beautiful but evil design by some mythical powers who wish to dominant markets and cultures. The pieces of the design are to:

- Exploit human vanity to encourage the production of valueless information to get more users to consume more products.
- Exploit the Pareto distribution of content value and pay a few people millions for producing the most widely consumed content (sort of like the TV show *American Idol* or a state lottery). This will encourage more generation of pulp non-fiction, thus enlarging the size of the long tail.
- Keep extending the long tail to ensure fragmentation of the populace. If a new intermediary tries to take the consumers away from you, buy them out. Accumulate enough cash so you can repeat at will.
- Develop RIA so that expertise development is stunted, thus aiding fragmentation and reducing challenges to your control.
- Use technology that can keep tabs on everyone at all times.
- Use *Time* magazine to sprinkle fairy dust on the entire scheme by calling all your loyal subjects the “person of the year.” Let them eat cake. Continue to extract profits.

I do not seriously believe such evil intention was ever at play or is now. Moreover, increased fragmentation, while good for some control, is not good for changing the status quo and making market or societal improvements that will

require the coordination of many. But, being part Meliorist, it is hard to resist the temptation to view the entire scheme this way.

## WEB 2.0 PREDICTIONS

The report concludes by offering some of my predictions regarding Web 2.0.

### *Enterprise Predictions*

For enterprises wishing to exploit Web 2.0, a number of predictions emerge from this perspective:

- Web 2.0 approaches will remain entrenched in human society.
- Web 2.0 intermediaries will leapfrog each other until a near monopolistic threshold is reached. A few intermediaries will remain and will inherit the title of “mainstream media.”
- The Internet advertising model will, over time, continue to threaten traditional software manufacturers, especially in the consumer software space. Using software as a loss leader for other paid services will continue to grow. Due to the very different shape of enterprise information, it is unlikely that the Internet advertising model will affect enterprise software vendors like SAP and Oracle.
- More industries will experience more turbulence, not less. Firms within those industries will take differential advantage of the increased quantity of information that Web 2.0

creates, leading to imperfect competitor reaction. While many firms will have a limited repertoire of Web 2.0 techniques, consumer markets establish the overall economic patterns. Web 2.0 will increase turbulence in many consumer industries, as it is doing now. It is a matter of time before upstream suppliers to the consumer markets feel the heat.

- Firms and individuals at the edge will have no more economic power relative to the center. The same tools that give the edge more power are available to the center to increase its scale and control.
- Intellectual ownership issues in or near the chaotic region of the I-Space that can cause firms some trouble are likely to increase. At stake are control over Web 2.0 APIs and Web services that diffuse data and the ownership rights of previously valueless information and data that may suddenly become valuable. Firms should be careful in examining intellectual ownership issues and implications as they partner with firms that make their living in this chaotic regime. Web 2.0 startups are particularly at risk.
- For the majority of firms, Web 2.0 technologies and approaches will not appreciably affect their ability to extract profits from the knowledge within the SLCs. Due to cultural, psychological, and

organizational problems, more information will not help. The technology to codify, abstract, and diffuse information has exceeded the human ability to exploit it. The expertise to absorb this information and use it perhaps follows a Pareto distribution. The few that can exploit this are likely to find significant short-term advantage.

- Firm size may continue to decrease, as it has been doing over the past 20 or so years. Web 2.0 technologies, especially social networking and virtual reality tools, may be useful means for developing a distributed workforce. This will help firms achieve scale efficiently and may continue to encourage firms to coordinate a flotilla of partners rather than aggregate them into a bigger form.

### *Political Predictions*

Perhaps the more intriguing aspects of Web 2.0 involve its effect on governments. While this is certainly of concern to us technologists, I will leave further discussions to other Meliorists and Panglossians out there. I believe the analysis presented so far leads to the following predictions:

- Web 2.0 will be disruptive for incumbents in governments. Groups of citizens opposing incumbent power will continue to take advantage of Web 2.0 techniques. They will be able to move faster than governments, thus causing

shifts in public sentiment quickly.

- Governments that need to control the spread of information will in some cases attempt to control Web 2.0 but will also find ways of exploiting it. The same tools that give the edge additional power are available to the center as well. Over the long term, the information arms race may not exclusively favor the smaller party.
- Free speech and anonymity issues will continue to be problematic. Since those who wish to oppose governments need to use digital media, they will continue to exploit the limitations of the Internet standards to hide themselves. If we were to fix the problems with the Internet technology so that all parties can be unambiguously identified and all forms of text can be clearly identified as desirable and undesirable, we will be helping control spam and fraud while assisting governments that wish to oppress people.
- The essentially voluntary fragmentation of the long tail may reduce political cohesiveness, making it harder for societies to solve problems. Common information shared by all forms the basis of political unity. If the populace is further balkanized, group polarization may increase, despite the free availability of information [22].

## RECAPITULATION

For better or for worse, Web 2.0 is here to stay. The main fuel powering Web 2.0 is the need people have to feel they have published something and the need for social involvement. Since traditional social networks — the family, the local community, religious affiliations, and even the workplace — do not provide the stickiness they used to, it is no wonder that the Web is rushing to fill the void. Multiplayer games, social networking, and virtual reality are all digital social networks that millions of people are finding enjoyable. Relationships have gone digital, especially with the young.

Web 2.0 has evolved to exploit the mass of chaotic data Web 2.0 produces. RSS, social bookmarks and tagging, and blogs and wikis are ways of giving this chaotic data a little more structure through slightly increased levels of codification and abstraction. This lets firms like Google more effectively search that information to better match users to advertisers. The need to economize on costs to feed an increasingly hungry and hard-to-defend long tail means that Web 2.0 will require intermediaries with enormous scale and will require more valueless data to be produced so it can be tagged, codified, indexed, searched, and used to match advertisers to consumers.

Web 2.0 helps information diffuse widely and rapidly. Some firms will

find ways to increase the speed and range of their social learning cycles to take advantage of this initially valueless but fast-moving information. As more firms do this, their markets may continue to increase in turbulence, with potential technological arms races developing in IT-intensive industries.

Firms will need to carefully inspect the shape of information and their SLCs within their markets and get a sense of the affective qualities of information in their SLCs before adopting Web 2.0. Due to the significant differences between the Web 2.0 we have today and the so-called Enterprise 2.0 that some are now calling for, it is possible that, for many firms, little of Web 2.0 will apply in corporate enterprise settings. These differences include: differences in how firms use information to make profit, differences in the affective qualities of information, differences in the scale of the long tail, and differences in cultural and organizational aspects between firms and general consumer populations. Enterprise 2.0 will not look like Web 2.0.

While many are claiming Web 2.0 is empowering, it may be ushering in a new age of an even more powerful center. Because Web 2.0 intermediaries require scale and, for now, secret proprietary technology to maintain an advantage, and because the long tail of consumption is highly fragmented, firms wishing to serve as

Web 2.0 intermediaries need to think long and hard about the competitive strategies they would employ.

Yes, Web 2.0 does represent a paradigm shift of sorts. It has ushered in a new era of engaging millions of people in new ways. As Panglossians have been saying, there is opportunity and potential. But as the Meliorists rightly point out, it isn't that simple. The slippery and often paradoxical nature of information will ensure this.

## REFERENCES

1. Anderson, Chris. *The Long Tail: Why the Future of Business Is Selling Less of More*. Hyperion, 2006.
2. Argyris, Chris. "Initiating Change that Perseveres." *American Behavioral Scientist*, Vol. 40, No. 3, 1997.
3. Arrington, Michael. "Things Sure Are Quiet at MySpace News." TechCrunch, 14 May 2007 ([www.techcrunch.com/2007/05/14/things-sure-are-quiet-at-myspace-news](http://www.techcrunch.com/2007/05/14/things-sure-are-quiet-at-myspace-news)).
4. Boisot, Max H. "Is There a Complexity Beyond the Reach of Strategy?" *Emergence*, Vol. 2, No. 1, 2000.
5. Boisot, Max H. *Knowledge Assets: Securing Competitive Advantage in the Information Economy*. Oxford University Press, 1998.
6. Boyd, Stowe. "Social Media: A Revolution in the Making." Cutter Business Intelligence *Executive Report*, Vol. 6, No. 10, October 2006.
7. Brynjolfsson, Erik, Andrew McAfee, Feng Zhu, and Michael Sorell. "Scale Without Mass: Business Process Replication and Industry Dynamics," 2007 (<http://ssrn.com/abstract=980568>).
8. Carr, Nicholas. "The Amoralism of Web 2.0." Rough Type blog, 3 October 2005 ([www.routhtype.com/archives/2005/10/the\\_amorality\\_o.php](http://www.routhtype.com/archives/2005/10/the_amorality_o.php)).
9. Carr, Nicholas. "Is Web 2.0 Enterprise-Ready?" Rough Type blog, 12 April 2006 ([www.routhtype.com/archives/2006/04/is\\_web\\_20\\_enter.php](http://www.routhtype.com/archives/2006/04/is_web_20_enter.php)).
10. Carr, Nicholas. "Is Web 2.0 the Wrong Path?" Rough Type blog, 25 November 2006 ([www.routhtype.com/archives/2006/11/is\\_web\\_20\\_the\\_w.php](http://www.routhtype.com/archives/2006/11/is_web_20_the_w.php)).
11. Carr, Nicholas G. "IT Doesn't Matter." *Harvard Business Review*, May 2003.
12. Carr, Nicholas. "Two Views of Web 2.0 in Business." Rough Type blog, 21 March 2007 ([www.routhtype.com/archives/2007/03/american\\_compan.php](http://www.routhtype.com/archives/2007/03/american_compan.php)).
13. Carr, Nicholas. "Web 2.0's Numbskull Factor." Rough Type blog, 27 April 2006 ([www.routhtype.com/archives/2006/04/web\\_20s\\_numbsku.php](http://www.routhtype.com/archives/2006/04/web_20s_numbsku.php)).
14. Carr, Nicholas. "Web 2.0lier Than Thou." Rough Type blog, 23 October 2006 ([www.routhtype.com/archives/2006/10/web\\_20lier\\_than.php](http://www.routhtype.com/archives/2006/10/web_20lier_than.php)).
15. Ericsson, K. Anders, Neil Charness, Paul J. Feltovich, and Robert R. Hoffman (eds.). *The Cambridge Handbook on Expertise and Expert Performance*. Cambridge University Press, 2006.
16. Feller, Joseph. "Web 2.0: What, So What, Now What?" *Cutter Benchmark Review*, Vol. 7, No. 2, February 2007.
17. Forgas, Joseph P. (ed.). *Feeling and Thinking: The Role of Affect in Social Cognition*. Cambridge University Press, 2000.
18. Koch, Christopher. "Web 2.0: A Community in Denial." Koch's IT Strategy blog, 17 January 2007 (<http://blogs.cio.com/node/647>).
19. McAfee, Andrew. "Enterprise 2.0: The Dawn of Emergent Collaboration." *MIT Sloan Management Review*, Vol. 47, No. 3, Spring 2006.
20. Murugesan, San. "Business Uses of Web 2.0: Potential and Prospects." Cutter Business-IT Strategies *Executive Report*, Vol. 10, No. 1, January 2007.



21. Musser, John, and Tim O'Reilly. "Web 2.0: Principles and Best Practices." O'Reilly Media, Inc., 2006.

22. Sunstein, Cass R. "Is the Internet Really a Blessing for Democracy?" *Boston Review*, Summer 2001 ([www.bostonreview.net/BR26.3/sunstein.html](http://www.bostonreview.net/BR26.3/sunstein.html)).

23. TNS, Teenage Research Unlimited and Marketing Evolution. "Never Ending Friending: A Journey into Social Networking." Fox Interactive Media, Inc., Isobar, and CaratUSA, 2007.

24. Welsh, Tom. "Web 2.0." *Cutter Enterprise Architecture Executive Report*, Vol. 9, No. 7, July 2006.

### ABOUT THE AUTHOR

Vince Kellen is the VP of Information Systems (CIO) and a member of the faculty of the School for Computer Science, Information Systems, and Telecommunications at DePaul University. Prior to joining DePaul in 2003, Mr. Kellen served as a business strategy and IT consultant for several large and mid-sized companies, including 20th Century Fox, Exxon/Mobile, General Mills, SC Johnson, Arthur J. Gallagher Insurance Co., and R.R. Donnelley. He has spoken nationally and internationally on CRM, knowledge management, and information visualization.

Mr. Kellen has written four books on database technologies and numerous articles on technology

topics, including many for Cutter Consortium. He lectures on enterprise architecture, CRM technologies, and distributed systems and is currently researching the impact information visualization has on decision making. He can be reached at [vkellen@depaul.edu](mailto:vkellen@depaul.edu).

# Web 2.0: Leveraging Second-Generation Web Technologies

**Title:** Web 2.0: Leveraging Second-Generation Web Technologies

**Authors:** Troy Angrignon, John Berry, Cassian Drew, Curt Hall, Leslie A. Jump, Vince Kellen, Brian Pontarelli, David Rowe, Bruce Taylor, Tom Welsh, Langdon White, Ed Yourdon.

**Published:** December 2006

**Pages:** 128

**Price:** \$247 / US \$262 outside North America (Please use code 18R\*E11INS when ordering.)

## Summary

What's all the buzz about Web 2.0? How can your organization harness Web 2.0 tools, technologies, and concepts (including such things as blogs, wikis, and the Long Tail concept) to create business value?

The new Cutter Consortium report *Web 2.0: Leveraging Second-Generation Web Technologies* distills current thinking on the essence and interpretation of Web 2.0 and provides guidance on identifying Web 2.0 business opportunities and threats at your organization.

You'll discover how to use Web 2.0 tools and technologies to:

- Differentiate your organization from your competitors
- Find new customers, retain existing customers, and provide your services at a higher profit margin
- Capture corporate memory, best practices, and relevant experiences throughout your company
- Take advantage of the Long Tail to discover new markets and expand existing ones
- Leverage corporate blogs as a marketing/sales tool

- Use Web services to attract small retail partners who can leverage your company's products
- Realize the long-sought vision of the "network as platform"

## Table of Contents:

### Introduction: Creating Business Value with Web 2.0

**1. The Impact of Web 2.0 on Enterprise Strategy** by David Rowe and Cassian Drew. Learn why Web 2.0 is an enterprise issue and get guidelines for integrating Web 2.0 tools and technologies with your business strategy.

**2. Driving Revenue Growth with Web 2.0** by Troy Angrignon. Gain a series of tactical applications of Web 2.0 that can be used *now* to create shareholder value for your company.

**3. Web 2.0 and Enterprise Business Intelligence** by Langdon White. Help your company develop better business intelligence — through Web services APIs (like the Google Maps mashup API) and Really Simple Syndication (RSS).

**4. Forming Product Communities in Web 2.0** by Bruce Taylor. Explore the mechanisms by which product communities form and how this process is

Business  
Technology  
Trends & Impacts

Go to [www.cutter.com/bookstore.html](http://www.cutter.com/bookstore.html)

**ABOUT CUTTER ...**

Cutter Consortium offers high-level advisory and publication services, onsite assessments, consulting, and training to help organizations forge solutions to the IT challenges they face.

Cutter's clients are able to tap into its expertise in a variety of formats, including print and online advisory services and journals, mentoring, consulting, workshops, and training.

For more information on Cutter Consortium, please visit [www.cutter.com](http://www.cutter.com).

affected by wikis, RSS, pervasive data indexing, and tagging.

**5. Identity, Trust, and Reputation 2.0** by Brian Pontarelli. Review the issues of identity, trust, and reputation, and discover what improvements need to be made before nontrivial interactions can take place on the Web.

**6. Web 2.0 and CRM: Harnessing the Power of Collective Business Intelligence** by Leslie A. Jump and Vince Kellen. Learn how to marshal the energies and passions of customers via "consumer-generated marketing."

**7. Web 2.0** by Tom Welsh. Explore the proposition that Web 2.0 is a newer, better model than the original Web and dig into the tangled mess of technology associated with Web 2.0.

**8. Enterprise 2.0: Hip or Hype?** by Curt Hall. Examine the philosophy underlying the concepts of Web 2.0 and Enterprise 2.0 and how companies

seek to actively involve their employees, partners, and customers in their business operations.

**9. Web 2.0 — Software as Services** by John Berry. Discover five trends that support the acceleration of software-as-a-service.

**To Order/For More Info:**

Go to our secure bookstore at [www.cutter.com/bookstore.html](http://www.cutter.com/bookstore.html). (Please enter code 18R\*E11INS at checkout.) You can also order by: E-mail: [service@cutter.com](mailto:service@cutter.com) Fax: +1 781 648 8707 Tel: +1 781 648 8700

We accept all convertible currencies. Please contact us for current exchange rates or for information on processing a wire transfer. (Checks in US dollars must be payable at a US bank. Checks in other currencies must be payable in the country of origin.) Thank you.

Go to [www.cutter.com/bookstore.html](http://www.cutter.com/bookstore.html)

**YES!** Please send me \_\_\_ print copies of the report **Web 2.0: Leveraging Second-Generation Web Technologies** at the rate of \$247, US \$262 outside North America.

I prefer the PDF version. Please send the report in PDF format by e-mail for US \$247.

Name \_\_\_\_\_ Title \_\_\_\_\_

Organization \_\_\_\_\_ Dept. \_\_\_\_\_

Address/P.O. Box \_\_\_\_\_ Mailstop/Suite \_\_\_\_\_

City \_\_\_\_\_ State/Province \_\_\_\_\_

ZIP/Postal Code \_\_\_\_\_ Country \_\_\_\_\_

Telephone \_\_\_\_\_ Fax \_\_\_\_\_

E-Mail (be sure to include for PDF delivery) \_\_\_\_\_



Payment or P.O. enclosed.

Charge Mastercard, Visa, AmEx, Diners Club. (Charge will appear as Cutter Consortium.)

Card # \_\_\_\_\_

Expiration Date \_\_\_\_\_

Signature \_\_\_\_\_ Priority Code: 18R\*E11INS  
RP18EP/pdf

Mail to Cutter Consortium, 37 Broadway, Suite 1, Arlington, MA 02474-5552, USA; fax to +1 781 648 8707; call +1 781 648 8700; send e-mail to [service@cutter.com](mailto:service@cutter.com); or order online at: [www.cutter.com/bookstore.html](http://www.cutter.com/bookstore.html). (Enter Priority Code 18R\*E11INS at checkout.)

# Business Intelligence Practice

The strategies and technologies of business intelligence and knowledge management are critical issues enterprises must embrace if they are to remain competitive in the e-business economy. It's more important than ever to make the right strategic decisions the first time.

Cutter Consortium's Business Intelligence Practice helps companies take all their enterprise data, augment it if appropriate, and turn it into a powerful strategic weapon that enables them to make better business decisions. The practice is unique in that it provides clients with the full picture: technology discussions, product reviews, insight into organizational and cultural issues, and strategic advice across the full spectrum of business intelligence. Clients get the background they need to manage technical issues like data cleansing as well as management issues such as how to encourage employees to participate in knowledge sharing and knowledge management initiatives. From tactics that will help transform your company to a culture that accepts and embraces the value of information, to surveys of the tools available to implement business intelligence initiatives, the Business Intelligence Practice helps clients leverage data into revenue-generating information.

Through Cutter's subscription-based service and consulting, mentoring, and training, clients are ensured opinionated analyses of the latest data warehousing, data mining, knowledge management, CRM, and business intelligence strategies and products. You'll discover the benefits of implementing these solutions, as well as the pitfalls companies must consider when embracing these technologies.

## Products and Services Available from the Business Intelligence Practice

- The Business Intelligence Advisory Service
- Consulting
- Inhouse Workshops
- Mentoring
- Research Reports

## Other Cutter Consortium Practices

Cutter Consortium aligns its products and services into the nine practice areas below. Each of these practices includes a subscription-based periodical service, plus consulting and training services.

- Agile Project Management
- Business Intelligence
- Business-IT Strategies
- Business Technology Trends & Impacts
- Enterprise Architecture
- IT Management
- Measurement & Benchmarking Strategies
- Enterprise Risk Management & Governance
- Sourcing & Vendor Relationships

# Senior Consultant Team

The Senior Consultants on Cutter's Business Intelligence team are thought leaders in the many disciplines that make up business intelligence. Like all Cutter Consortium Senior Consultants, each has gained a stellar reputation as a trailblazer in his or her field. They have written groundbreaking papers and books, developed methodologies that have been implemented by leading organizations, and continue to study the impact that business intelligence strategies and tactics are having on enterprises worldwide. The team includes:

- Verna Allee
- Stowe Boyd
- Ken Collier
- Clive Finkelstein
- Jonathan Geiger
- David Gleason
- Curt Hall
- David C. Hay
- André LeClerc
- Lisa Loftis
- David Loshin
- Larissa T. Moss
- Ken Orr
- Gabriele Piccoli
- Thomas C. Redman
- Ricardo Rendón
- Michael Schmitz
- Ed Schuster
- Karl M. Wiig