# Internet Accuracy

Is information on the Web reliable?

The Internet has been a huge boon for information-seekers. In addition to sites maintained by newspapers and other traditional news sources, there are untraditional sources ranging from videos, personal Web pages and blogs to postings by interest groups of all kinds — from government agencies to hate groups. But experts caution that determining the credibility of online data can be tricky, and that critical-reading skills are not being taught in most schools. In the new online age, readers no longer have the luxury of depending on a reference librarian's expertise in finding reliable sources. Anyone can post an article, book or opinion online with no second pair of eyes checking it for accuracy, as in traditional publishing and journalism. Now many readers are turning to user-created sources like *Wikipedia*, or powerful search engines like Google, which tally how many people previously have accessed online documents and sources — a process that is open to manipulation.
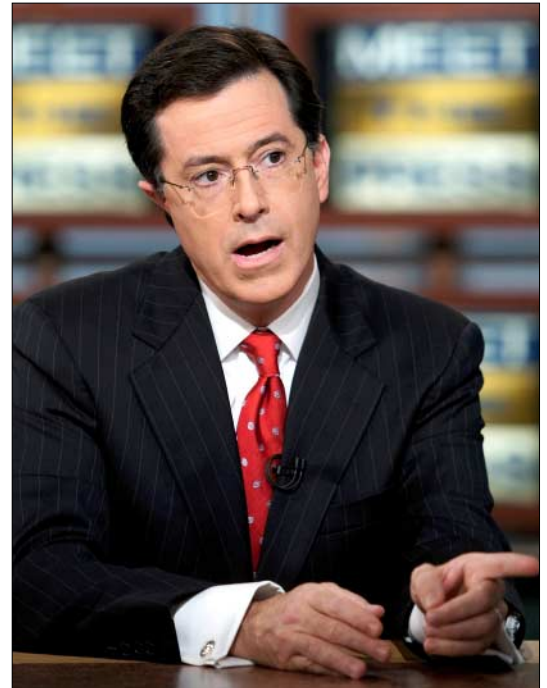
Wikipedia *banned Stephen Colbert, host of Comedy Central's "The Colbert Report," from editing articles on the popular online site after he made joke edits.*

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Cover: Getty Images for Meet the Press/Alex Wong

Internet Accuracy

BY MARCIA CLEMMITT

THE ISSUES

Is Barack Obama a Muslim? The answer, unequivocally, is no, he's a Christian who goes to church regularly. But according to some Internet sites — especially white-supremacist Web sites — the man who could be the next president of the United States not only practices Islam but is practically a terrorist.

Obama's campaign has fought back, launching a Web site — "fightthesmears.com" — to correct the misinformation about the candidate, including false claims that his campaign contributions largely have come from wealthy supporters in the Middle East. [1]

Obama isn't alone, of course, when it comes to inaccurate information on the Internet.

As millions of people and organizations around the world post information on the Internet, factual mistakes are alarmingly easy to find, and they don't just come from hate groups or "from shady, anonymous, Internet authors posing as reliable art historians," according to two historians at George Mason University in Fairfax, Va. Indeed, they say, misinformation often comes from highly reputable institutions.

In a study of Web sites highly ranked in Google searches, they found an incorrect date in a biography of the French Impressionist painter Claude Monet — the date he moved to Giverny, the small village west of Paris where he painted his famous images of water lilies. No less an authority than the Art Institute of Chicago posted an erroneous date (the correct date is 1883)

Wikipedia, *the phenomenally popular user-generated online information source, has come to symbolize the controversy over Internet accuracy. Supporters say wikis — along with blogs and other online postings — provide vast amounts of information and that factual errors are quickly corrected by readers. Critics say wikis are prone to manipulation, uncorrected errors and poorly written entries due to frequent, uncoordinated changes.*

CQ Press/Olu B. Davis

while "the democratic (and some would say preposterously anarchical)" Web site Wikitravel got it right, according to the study. [2]

In the past, a countable number of sources produced most of the world's information, and most readers and viewers took the names of top newspapers, magazines and television networks as a modest guarantee that they would be accurate.

But as information migrates onto the Internet and newspapers and network TV news outlets see their audiences declining, all that is changing. [3] Today the World Wide Web is a user-driven medium, where teenage videographers and political activists of all stripes can post their messages, often in formats

as sophisticated-looking as the sites mounted by television networks and major newspapers. The tidal wave of citizen-generated content has made it much harder to ferret out the most credible sources, which has many people alarmed, including some policy makers.

For example, in May, Sen. Joseph I. Lieberman, I-Conn., asked Google to remove online YouTube videos that he says al Qaeda and other terrorist groups post to spread false and slanted anti-Western information. The company removed some videos but refused to block all videos from certain groups, as Lieberman requested. [4] (*See "At Issue," p. 641.*)

Terrorist propaganda aside, "there are fewer signposts" online to signal reliability, such as newspaper brand names, says Larry Pryor, an associate professor of journalism at the University of Southern California's Annenberg School for Communications.

Wikis — user-generated online publications — like *Wikipedia* are edited by staff and other users only after they've been published online, unlike in traditional media, where editing comes before publication, notes Pryor. Furthermore, while some wiki entries are written by experts, others are contributed by people with no expertise in the subject matter, and it's difficult or impossible for unwary readers to tell the difference.

In a critique of *Wikipedia's* 2005 entry on "haute couture" — high fashion — *Vogue* magazine Editor Alexandra Shulman wrote that, "broadly speaking, it's inaccurate and unclear. . . . There are a few correct facts included, but every value judgment it makes is wrong." [5]

Internet Is Top Source for Answers

People seeking information on problems consult the Internet the most, followed by professional advisers, friends and family members.

Percentage Who Consult Specific Sources When They Need to Address Problems

Source	Percentage
Internet	58%
Professional advisers	53%
Friends and family	45%
Newspapers, magazines and books	36%
Government office or agency	34%
Television and radio	16%
Public library	13%
Other	11%
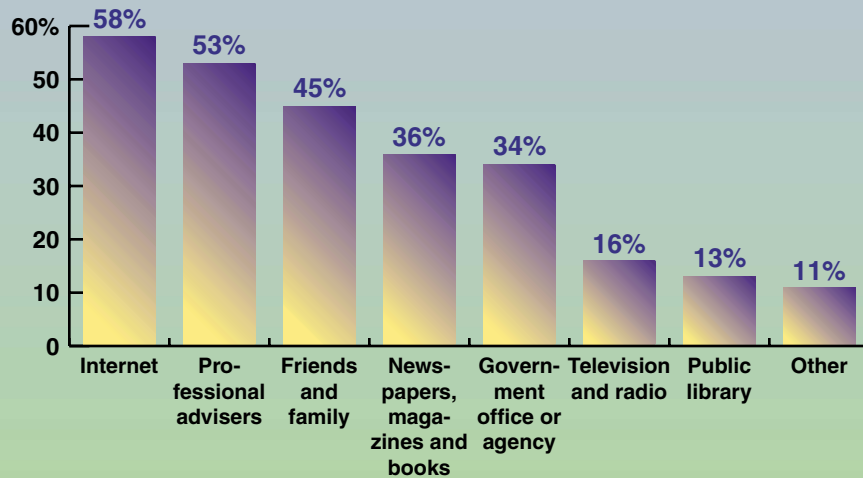
Sources: Pew Internet & American Life Project and University of Illinois Libraries Survey, June 27-Sept. 4, 2007; 2,796 people were surveyed

Nevertheless, not all so-called new media is inaccurate, says David Perlmutter, a professor at the University of Kansas' William Allen White School of Journalism. Take blogs, for example. "While some are merely sock puppets" spouting Republican or Democratic party talking points, "those are not very well-respected," while the most popular political blogs are the less biased ones, he says. [6]

In fact, online media frequently act as credibility watchdogs for traditional media, says Perlmutter. Many bloggers are experts, such as military officers and technology specialists, who are "big fact-checkers," using their specialized knowledge to spot false information in areas such as war reporting, he says.

For example, "it was . . . Russ Kick's *Memory Hole*, not *The New York Times*, that first broke pictures of military personnel brought home in [caskets] from Iraq," said Yochai Benkler, a professor at Yale Law School. [7]

Much online information also contains good clues with which to judge its credibility, says R. David Lankes, an associate professor at Syracuse University's School of Information Studies. For example, blogs usually contain biographies of their authors, and wikis have a history of the editing changes to posted articles.

Google News and Yahoo! News — sites that aggregate what are supposedly the days' top news stories — "are more scary" because they don't share the rules on which their rankings are based, says Lankes. But the online world is huge, and there's usually an alternate voice to consult on any issue, he says, "and that allays my fears a bit" about being misinformed.

The vast store of information available online has a major benefit: "We no longer have to rely on single authorities," says Lankes. The downside is that "we have to work harder to determine credibility."

But are Internet users prepared to be critical consumers of information? "The flaws in *Wikipedia* and other kinds of media are real" and "demonstrate how much we need to update our media literacy in a digital . . . era," said Dan Gillmor, director of the Center for Citizen Media, a project to support grassroots journalism jointly supported by Harvard and Arizona State universities. [8]

For example, when *Wikipedia*'s article on Pope Benedict XVI initially appeared — only a few hours after his election on April 19, 2005 — the page "suffered vandalism," with false statements and accusations popping up that very same day, said Gillmor. "Over time," the entry "will settle down to something all sides can agree on," Gillmor blogged later that day, but for the moment, "the vandals are having a good time mucking with the page, I'm sorry to report. What jerks they are." [9]

"Our internal b.s. meters . . . work, but they've fallen into a low and sad level of use in the Big Media world," Gillmor continued. "Many people tend to believe what they read. Others tend to disbelieve everything. Too few apply appropriate skepticism."

In fact, some online material can mislead readers into thinking it's from a more reliable source than it is. For example, "a hospital Web site may not look any different from the herbal remedy store's Web site — or from an accomplished teenager's hobby page," said Frances Jacobson Harris, a professor of library administration at the University of Illinois at Urbana-Champaign. Even "relevancy ranking" — as in Google search results — can mislead, she said. For example, at one time a Google search for "Martin Luther King" pulled up a disguised anti-King hate site as its top result, partly because librarians had linked to the page as an example of untrustworthy information, said Harris. [10]

And despite young people's reputations as digital natives and Internet gurus, their "skills in effective navigation

of today's information landscape are actually somewhat limited," Harris wrote. "They always find something when searching for information, just not always the best thing." [11]

For example, young researchers often "make credibility judgments that rely heavily on design and presentation features rather than content," he continued. [12]

Others argue that growing up online naturally makes one a savvier Internet user.

"Information overload" can overwhelm older generations, but the younger generation "doesn't know the phrase," says Penelope Trunk, a veteran blogger in Madison, Wis., who writes about careers in the Internet Age. Immersed in the online world practically from birth, "they're just smarter about information."

But "it's not how old you are but how long you've been online" that improves research skills, says Lankes. While some expect young people to be Internet experts, Lankes says, "I don't buy it. If we create this monolithic view of kids as technologically literate, we'll do a great disservice to kids who aren't."

Some fear that the double burden of teaching old-fashioned literacy, still vital online, plus the critical thinking required to sort through the vast amount of online information will increase the so-called digital divide, leaving low-income students — those who don't have computers or have limited computer literacy — further and further behind. [13]

"The industry argues that the digital divide is gone, but that's not true," says Erik Bucy, an associate professor of telecommunications at Indiana University. "We have to think of access to digital technology as a cognitive problem and a social problem," not just an issue of handing out computers, he says.

The Web was born in 1992, and "16 years in the evolution of man is not a long time," says Lankes. Nevertheless, "already we're seeing people learning to read it intelligently. Kids

User-Driven News Sites Use Non-News Sources

Seven out of 10 stories posted on Internet sites that aggregate news items submitted by users come either from blogs or non-news sites, such as YouTube. Many of the stories users selected did not appear among the top stories in mainstream media coverage.

Sources of News Stories on Reddit, Digg and Del.icio.us, June 24-29, 2007
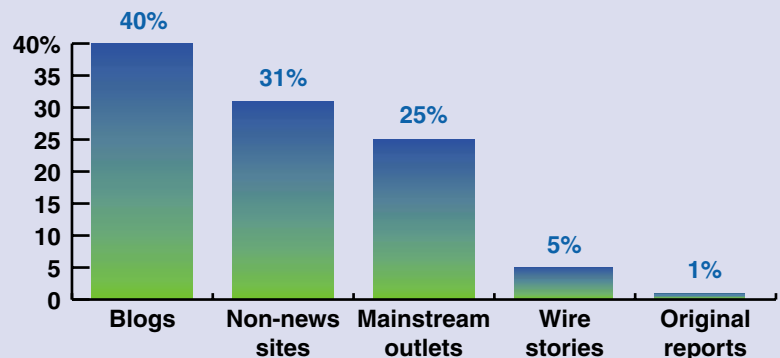
* Figures do not total 100 due to rounding

Source: "The News You Choose," Pew Research Center, September 2007

understand very well what they're seeing in *Wikipedia*," he says, knowing they must judge credibility "article by article," rather than trusting the site as a whole, as one might do with the *Encyclopaedia Britannica*, he says.

The rules of collaborative, user-generated media like wikis have been developing for less than a decade, so it's unrealistic to expect perfection, says Siva Vaidhyanathan, associate professor of media studies and law at the University of Virginia in Charlottesville. One promising approach is typified by Slashdot — a Web site that posts technology news based on how many site users rate it as valuable, he says. Contributors get "reputation scores" based on votes from other site users, and it becomes clear over time that some "are more credible than others," he says.

Google's page-rank algorithm, which ranks pages based on how many other Web pages link to them, amounts to a public "vote on credibility," says

Lankes. It has turned out to be another kind of reliability test that is fairly accurate and "very powerful."

But some analysts call the idea that accurate information can arise from "collective intelligence" — the philosophy behind the Web's user-generated media and user-based ranking systems — a pipe dream.

"One need only look at the composition of the Internet to understand why the 'wisdom of crowds' will never apply," wrote Andrew Orlowski, a technology columnist for *The Register* in the United Kingdom. The Internet doesn't represent society because "only a self-selecting few" have any interest in information projects, which "amplifies groupthink," Orlowski charged. "Facts that don't fit beliefs are discarded." [14]

As readers, writers and technology experts grapple with the challenges of the new online world of information, here are some of the questions being asked:

Is information on the Internet reliable?

Clearly, Internet users have access to more information than at any time in history, but is high-quality information getting lost?

"I'm a great fan of the blogosphere," says the University of Southern California's Pryor. "You can find Web sites on any topic," and many bloggers are academics or technical experts, providing an unprecedented opportunity for the public to share the thinking of top minds, he says.

Many political blogs, like the *Huffington Post*, "allow the public to participate in news gathering," which benefits information-seekers, "since they come up with things that traditional journalists would never write about," Pryor says.

When it comes to breadth of coverage, "nothing comes close" to *Wikipedia*, "not even *Encyclopaedia Britannica*," says Jim Jansen, an assistant professor in the College of Information Sciences and Technology at Pennsylvania State University.

Furthermore, worries that many people lie online are overblown, says Jeffrey T. Hancock, an associate professor of communications at Cornell University. "Reasons to lie on the Internet are the same ones we have in real life," such as enhancing our reputations or accomplishing some specific goal, he says. Few people actually say, "Hey, I'm online, why not just lie?" Even in online situations where lying is most likely — like postings on online dating sites — most who do lie only stretch the truth by about 15 percent, he says.

Some online media, such as wikis, have a transparent editing process that motivated readers can use to spot bias, says Jansen. [15] "With *Wikipedia*, the entire editing process is available to the consumer. You can see which articles are controversial" and why. And thanks to blogging traditions, even a strongly right- or a left-leaning blog usually links to the content that it's attacking, improving readers' chances of seeing the whole picture, says Perlmutter at the University of Kansas.

Moreover, fears that search-engine results will be skewed by who pays the most to get their sites listed have proven groundless, at least so far, says Jansen. The major search engines have resisted mixing pages they're paid to post with pages they turn up through unbiased searching, he says.

Nevertheless, there are many new digital forms of media content, and their credibility may be lower than the newspapers and magazines we're used to reading, says Pryor. For example, comment pages now exist on Web sites of all kinds, from traditional newspapers to blogs. "I think they're wonderful, but they are also particularly unreliable and dangerous" as an information source, Pryor says. "People cite all sorts of stuff in their comments that turn out to be absolutely wrong. But you can also find comments by people who are total experts and whose comments are like gold." Distinguishing between the two "is among the most treacherous issues" for readers, he says.

Some aspects of new media may make bias more likely. For example, most blogs have very small staffs that may reinforce each other's points of view and stifle other ideas, says Pryor. "As a reader, you may have a hard time figuring this out," he says.

In addition, wikis, such as *Wikipedia*, are vulnerable to malicious manipulation or errors that may be picked up and repeated by unwitting readers because they are checked by staff and other users only after being published online.

In one celebrated example, John Seigenthaler, Sr., former editorial director of *USA Today* and a former aide to Attorney General Robert F. Kennedy, was the victim of false information posted by an apparent *Wikipedia* prankster. For 132 days, Seigenthaler's entry included the false statement that "for a brief time," he "was thought to have been directly involved in the Kennedy assassinations of both John, and his brother, Bobby. Nothing was ever proven."

After discovering the misinformation, Seigenthaler — whose son John is a journalist with NBC News — said, "It was mind-boggling when my son . . . phoned later to say he found the same scurrilous text on Reference.com and Answers.com. At my request, executives of the three Web sites now have removed the false content about me. But they don't know, and can't find out, who wrote the toxic sentences. . . . I am interested in letting many people know that *Wikipedia* is a flawed and irresponsible research tool." [16]

While Google "is generally accepted as being 'clean' in terms of separating paid advertisements from sponsored ones," a hidden factor that may bias results anyway is "search engine optimization," which enables corporate sites to get to the top of search results by paying fees that total in the billions of dollars annually, said British technology columnist Victor Keegan." For example, he said, typing in something like "quiet family hotel in Venice" will take the user to hotel groups or online travel sites rather than to a hotel. [17]

Others worry that governments worldwide increasingly filter citizens' online access, skewing the information they get, Ronald Deibert, editor of the book *Access Denied: The Practice and Policy of Global Internet Filtering*, told the BBC. "Countries are selectively blocking access to information around key events, such as demonstrations or elections," he said. [18]

The Internet's speed and multiple authors also give "the rumor mill enormous new potential to spread" misinformation, says Joseph Turow, a professor at the University of Pennsylvania's Annenberg School for Communication.

However, there's "a certain amount of irony" in questioning the reliability of online news, says John Newhagen, an

associate professor of journalism at the University of Maryland in College Park. Even when people go online, "most are going to traditional news organization sites like CNN or *The New York Times*, and though the same information is on the Web site and in the paper, many people rate the information in the newspaper itself as more credible," he says.

Furthermore, "there have always been lots of schlocky, sleazy newspapers as well as great ones," says Jeff South, an associate professor of mass communications at Virginia Commonwealth University in Richmond.

And traditional news media are hardly unbiased, media critics say. In the non-Internet world, journalists "in survey after survey . . . report that they feel . . . pressures to avoid, slant or promote certain stories that might affect . . . powerful interests," such as suppressing negative stories about advertisers, government agencies and the media-company owners, said Fairness and Accuracy in Reporting, a left-leaning, New York City-based group. [19]

Is enough being done to teach people how to use the Web intelligently?

Many analysts say readers don't have the basic savvy to navigate online information. But others argue that experience is effectively educating Internet users, and that colleges, at least, are emphasizing critical analysis of information.

"We're increasingly creating a media-illiterate society," in which people trust what they've read on the Web and "don't know they're ill-informed," said Andrew Keen, English author of *The Cult of the Amateur*, which criticizes user-generated media. [20]

"An amazing number of people don't know that *Wikipedia* is user-generated," for example, says Richard H. Hall, a professor of information science at Missouri University of Science and Technology in Rolla.

"Despite the popularity of search engines, most users are not aware of how they work and know little about the implications of their algorithms," wrote researchers from Cornell University and the University of Charleston. "When Web sites rank highly in a search engine, they might not be authoritative, unbiased or trustworthy," and by repeatedly clicking only on the top-ranked sites users further cement those rankings, making it "more difficult for lesser-known sites to gain an audience," even if they are better. [21]

In the old-media world, "looking pretty" was a good sign that an information source was "produced by someone who has resources" and thus likely knew more, says Lankes of Syracuse. Online, however, "we're losing that shortcut. A 15-year-old kid can make a Web site that looks better than the ones put up by the federal government."

Many people indulge their own biases for or against online information, rather than conducting the kind of source-by-source consideration that's warranted, Hall says. Some professors refuse to take any online sources seriously, "while some students won't accept anything that didn't come from the Web," he says.

"Why is it that teachers spend so much time talking about students' lack of Internet skepticism and . . . so little . . . examining their own?" wrote Elizabeth Losh, an instructor and writing consultant at the University of California, Irvine. For example, "My fellow instructors have fallen for self-righteous campaigns against 'Bonsai Kitten,' " a joke Web site that claims to raise misshapen miniature pets in bottles. [22]

"The empirical research I have done does not bear out that [young people, who've grown up with the Web] use multiple sources" to corroborate information unless a teacher explicitly requires it, says Steve Jones, a professor of communications at the University of Illinois at Chicago. "I'm happy when they look at both Google and *Wikipedia*," he says. However, "you do need to separate the wheat from the chaff," so if "we are, in fact, using our critical faculty less, then it is a problem."

"A lot of people don't have the cognitive and social skills to exploit" what the Internet offers, says the University of Maryland's Newhagen. "And we're not going to solve access problems by carpet-bombing low-income people with computers," he says. A graduate student in one of his classes remarked that, as a substitute teacher in Washington, D.C., she'd "literally seen storerooms filled with computers because many teachers couldn't use them."

"The Web has lots of cognitive hurdles," requiring not only Internet literacy but also basic literacy, says Indiana University's Bucy. In fact, most of the population can't use the kinds of informational texts posted on the Internet, he adds.

Furthermore, "I'm not sure educational institutions have really got their minds around the problem, any more than society as a whole has," says South.

Currently, "there's little movement toward doing more with media literacy," says Bucy.

But at least some schools and colleges are beginning to teach online literacy.

"Despite the sometimes overwhelming challenges to teaching credibility assessment in today's school environment, many teachers and school librarians are finding ways to do so," said Harris of the University of Illinois. [23]

"I see plenty of efforts now — at least among the college ranks — to try to incorporate" critical-information searching into the curriculum, says Jones.

Furthermore, "we've only been doing this a short time, and we're going to get better at judging what we see out there," says the University of Virginia's Vaidhyanathan. Over the past decade "we've been steadily generating tactics to recognize quality" in information sites, such as user rankings, he says. "It's never going to work perfectly, but neither does *The New York Times*."

Entertainment Is the Most Popular Wiki Topic

Of the 230 most popular Wikipedia *pages, 43 percent relate to entertainment — more than any other category. The politics and history category was a distant second, garnering only 15 percent of the total — or about a third of the pages devoted to entertainment.*

Visits to Top 230 *Wikipedia* Pages, by Category
(Visited between September 2006 and January 2007)

Category	Percent
Entertainment	43%
Politics and history	15%
Geography	12%
Sexuality	10%
Science	6%
Computers	5%
Arts	2%
Religion	2%
Holidays	2%
Current events	1%
Drugs	1%
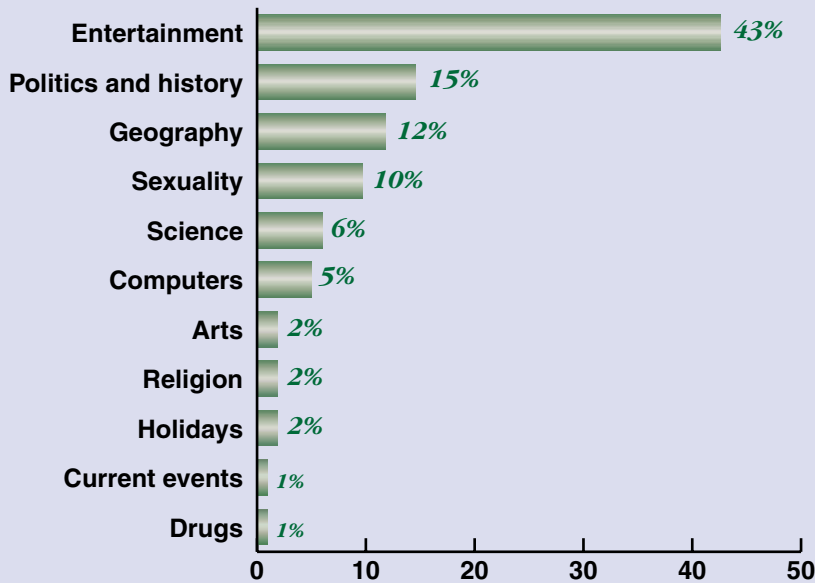
* Percentages do not total 100 due to rounding

Source: Anselm Spoerri, "What is Popular on Wikipedia *and Why?" First Monday, April 2, 2007*

Many students are savvier information seekers than they get credit for, says Soo Young Rieh, an assistant professor at the University of Michigan's School of Information. Her research finds that most students have heard professors caution that sources aren't always credible, so they engage in "a lot of cross-checking" and "social" means of corroborating information, such as e-mailing a professor, parent or friend with relevant knowledge, Rieh says. Many "also rely on multiple sourcing," such as gauging information more credible if they've found it "in a library book and also in a blog."

"I'm actually very optimistic" about online users' concern for making sure that information is reliable, she says.

More frequent Internet users "are better at sniffing out what's dishonest" there, says Pryor. But high-school students, who've literally grown up on the Web, "absolutely are miles ahead" of even current undergraduate and graduate students when it comes to shrewd use of online sources, says Pryor. "They are more attuned to the Internet, can navigate it better and are more capable of sniffing out the b.s.," he says. "If something is [public relations] they smell it," he says. "Young people have a better nose for when they're being manipulated."

Can collaborative media like wikis be made reliable?

The philosophy behind collabora-

tive media is that humans can arrive at better answers through "collective intelligence" than as individuals working alone. Some analysts call that notion a pipe dream, however.

"A core belief of the wiki world is that whatever problems exist in the wiki will be incrementally corrected as the process [of group editing] unfolds," wrote computer scientist and *Discover* magazine columnist Jaron Lanier. But "sometimes loosely structured collective activities yield continuous improvements, and sometimes they don't." [24]

The multiple authorship of wikis often squeezes out some points of view and produces text that is mostly disconnected, out-of-context facts, argues Lanier. "I've participated in a number of elite, well-paid wikis . . . and have had a chance to observe the results," he wrote. "What I've seen is a loss of insight and subtlety, a disregard for the nuances of considered opinions, and an increased tendency to enshrine the official . . . beliefs of an organization." [25]

"It is one thing to say that *Wikipedia* is amazing and useful; it is quite another to say that we couldn't do better by adding a role" for credentialed, subject-matter experts and professional editors, said Larry Sanger, a co-founder of *Wikipedia* and editor-in-chief of Citizendium, a new, expert-guided, collaboratively created online encyclopedia. [26]

From moment to moment, collaborative media can vary wildly, with no guarantee that material hasn't been recently vandalized, says *Wikipedia*'s own user-written article on "Why *Wikipedia* Is Not So Great." "Anyone can delete huge amounts of text from articles . . . or insert huge amounts of text into an article, destroying readability and all sense of proportion." [27]

Political topics on a wiki "can end up looking like CNN's 'Crossfire' rather than an encyclopedia article, with point-counterpoint in every sentence," says the user-written article on wiki faults. And even if peer review will improve the standard over time, "are there really

How to Evaluate Blogs and Online Information Sources

To begin with, ask basic questions.

With the huge variety of information sources available online, "critical thinking is more important than ever in sorting out what seems more reliable," says Doug Fisher, a former Associated Press news editor who teaches journalism at the University of South Carolina. Here are some tips to checking out the reliability of Web pages:

- **Look closely at the URL.** Many people mistakenly believe that an "org" suffix stands for something like "nonprofit organization," but in fact anyone can register an "org" domain, says Richard H. Hall, a professor of information science at Missouri University of Science and Technology in Rolla. By contrast, an "edu" suffix can only be held by an institution that has undergone some vetting by higher-education groups, he says. But even an "edu" page requires some caution, says Jeff South, associate professor of mass communications at Virginia Commonwealth University in Richmond, because the page could come from a professor, a freshman-class project or anyone working at the college, he says.

- **Locate the main Web site.** When you pull up a Web page, it's usually a good idea to check back to the main site to find out more about whoever posted the information, says South. To do that, simply lop off anything in the URL that follows the main domain suffix (such as .com or .edu). The main Web site should tell you clearly what person or group is responsible for its content. If a Web site doesn't do this, don't trust it, says Jeffrey T. Hancock, associate professor of communications at Cornell University, in Ithaca, N.Y. Posting one's identity is a good sign of trustworthiness in cyberspace, he says. "Can you Google this person or group and find out things about them?" If not, the Web site may not be trustworthy.

- **Can a real person be contacted?** "Check to see if you can contact a real person based on the Web site information," says Hall. "If there isn't a pretty detailed 'About' or 'About Me' page" or contact information, then there's reason to be suspicious.

- **Are there additional links?** Good online information "usually has references and links to additional information," both on other pages of its own site and on external Web pages, says Hall.

- **Are there misspellings and typos?** Grammatical errors on a Web page potentially indicate untrustworthy information, says South. "If they're breaking a lot of rules at the micro level, what does that suggest about the information they're presenting?"

- **Are there links to other sources?** For blogs, another test for reliability is whether writers cite or link to opinions of other writers that they disagree with, says Larry Pryor, an associate professor of journalism at the University of California's Annenberg School for Communications. "The more reliable blogs will reach out to other points of view" or at least point readers to pages where they can learn about them.

- **How long has the blogger been at it?** A blog will usually state how long the writer has been blogging, and longer is better, says Penelope Trunk, a veteran blogger in Madison, Wis., who writes about careers in the online age. "It takes time to resonate with the blogosphere and make changes" to improve your work, she says.

- **How many topics does the blog cover?** Blog sidebars usually list the main topic categories that the blog covers, says Trunk. "If there are too many and it's all over the place, then this is not an expert," she says.

- **What is the blog's format?** Formats can be clues to reliability too, says Trunk. Blogger Web sites generally have a default setting for organizing an individual blogger's page, and those who use the default may be less reliable "because they haven't put much time into" the project, says Trunk. Young readers in the blogosphere operate in a very different world of information than traditional media, Trunk argues. "Reliability" today means a writer who's developed a "personal brand" rather than one who operates under the "institutional brands" of the past, she says.

enough good writers with enough time . . . to mitigate this weakness?" [28]

Furthermore, while *Wikipedia* has broad coverage, topics are idiosyncratically chosen, not picked on the basis of their importance to society at large. For example, many people with causes contribute "to 'get the word out,' because publishers laugh at their stuff," and putting up their own Web sites would cost money, says the *Wikipedia* faults entry. Meanwhile, "opposing es-

tablishment figures get stubs" — *Wikipedia*'s term for incomplete articles of only a few sentences — "whose content is a litany of all the evil things they've done to the obscure activists," says the article. [29]

"If *Wikipedia* follows the pattern of every other 'community forum' on the Net, small groups will become powerful to the exclusion of others," and the "inherent bias and hostility issues are likely to get worse," says the article. [30]

But *Wikipedia* is evolving into a system where many things are marked as "questionable" or "needs sourcing," allowing readers to judge an article's reliability, says Newhagen at the University of Maryland.

Admittedly, "some of the back and forth about editing gets uncivil, but that has happened in academia before," says Penn State's Jansen. But because *Wikipedia* posts such arguments publicly, "you can identify the articles that are controversial,

and take them with a grain of salt." Meanwhile, many articles "have become stable," a good indicator of general accuracy, particularly for articles of high interest, which users would further edit and challenge if they disagreed, Jansen says.

Furthermore, *Wikipedia* requires contributors to post only information that has "already been published by reliable and reputable sources," which prevents too much outlandish misinformation, at least for frequently consulted articles, wrote John Willinsky, a professor of literacy and technology at the University of British Columbia. [31]

"*Wikipedia*'s long-lasting success is based not on anarchy but rather on a rigorous hierarchy," which should be the model for other collaborative and user-generated media, wrote Michael Maier, CEO of the German company Blogform Publishing. "Every article is strictly scrutinized before it is published and ultimately revised by the 'last editor,' who resides at the top of the hierarchy," he said." [32]

While the technology that allowed *Wikipedia* to be created also allows people to manipulate the content for their own agendas, by having a community vigilant against those sorts of edits, "they are, for the most part, kept in check," said Angela Beesley, chair of the Wikimedia Foundation's advisory board. [33]

The low barrier to entry for adding new content is vital to *Wikipedia*'s rapid growth and ability to cover many up-to-date topics and "works, . . . especially for non-controversial topics," said Virgil Griffith, a California Institute of Technology graduate student.

And although some recommend that anonymous edits be discontinued to ensure that information is unbiased, Griffith says *Wikipedia* should instead analyze controversial edits after the fact, tracking down and eliminating those that are false or self-serving. In fact, he invented a software program — WikiScanner — to trace anonymous *Wikipedia* edits to the originating orga-

nization, often a corporation or other group seeking to clean up its image. [34]

Moreover, some simple format clues can help alert readers to which wiki paragraphs are most likely to be accurate, according to Tom Cross, a founder of the social-networking site MemeStreams. For example, color-coded text could alert readers to "what assertions in an article have . . . survived the scrutiny of a large number of people, and what assertions are relatively fresh, and may not be as reliable." [35]

Wiki staff now understand that entries on major topics need to be held to a stricter standard of reliability, and "all the major entries are much more edited, vetted, and reliable today" than two or three years ago, says Marcus Messner, an assistant professor of communications at Virginia Commonwealth University.

Wikipedia is also open to a wider range of information than traditional encyclopedias, because it has no space limitations and has a different notion of what constitutes "neutrality," Messner says. For example, in a listing about a private company, *Wikipedia* will have "lots more about any scandals that have happened," than the *Encyclopaedia Britannica*, where "you don't see controversial content." ∎

BACKGROUND

Information Deluge

Every communication media and technology has had powerful, wide-reaching effects on humanity, and, while its consequences are as yet largely unknown, the digital era will be no different. [36]

Throughout history, new media technologies have threatened — and

even overturned — the powerful, says Irving Fang, a professor of communication history and broadcast journalism at the University of Minnesota. For example, the invention of the movable-type printing press in around 1450 changed Western history forever, not least by aiding the rise of Protestant reformers who challenged the Catholic Church.

"Without printing, Martin Luther could have ended up burned at the stake," like earlier would-be reformers, he says. Instead, printing "spread his words very fast," building support for his ideas first among German princes and laity, then quickly across Europe.

Media technologies throughout history have unexpectedly altered life for society and for individuals, he continues. For example, the telephone changed family relationships, allowing children to move far away, marry or find work while remaining in close touch. "If you retain a voice, you retain a lot," he says. The telephone also paved the way for other revolutionary developments, such as the skyscraper, which required communication devices for their construction and operation, Fang says.

Today, digital communication constitutes the biggest media revolution since the invention of printing and will bring with it changes of equal or even greater magnitude, says Jones of the University of Illinois. "Now that information is electronic, we're growing it exponentially," in both public and private domains, including the burgeoning digitization of everyday family life, says Jones. "Anybody born today is likely to have their whole life — photos, records, video — in digital form."

In 2002, for example, humans created a mound of new information equivalent in size to half a million libraries the size of the Library of Congress, about 92 percent of it digital and potentially available for Internet posting, according to researchers at the University of California, Berkeley. [37]

Chronology

1990s *The public goes online.*

1990
Alan Emtage, a student at Montreal's McGill University, creates Archie, the first tool for searching Internet archives.

1992
World Wide Web is introduced, allowing Internet users to navigate among hyperlinked documents, images and multimedia.

1993
Massachusetts Institute of Technology student Matthew Gray creates the first automated search device for the hyperlinked Web, the World Wide Web Wanderer.

1996
American computer programmer Ward Cunningham creates wiki software, allowing users to create a Web site collaboratively. . . . eBay introduces user-generated ratings to ease fears about buying and selling online.

1997
Sergey Brin and Larry Page launch Google as a Stanford University research project. Its page rankings, based on how many other sites link to a page, quickly make it the most popular search tool.

1999
U.S. software engineer John Swapceinski is inspired by a professor he disliked to launch the user-generated Ratemyprofessors.com Web site.

— • —

2000s *Collaborative, user-produced media accelerate information production.*

2000
American Internet entrepreneur Jimmy Wales launches *Nupedia*, an online encyclopedia offering free online content written by volunteer experts.

2001
Wales launches *Wikipedia*, an encyclopedia to be written by the public and intended as a feeder source for *Nupedia*.

2003
With few articles completed, *Nupedia* folds.

2004
Finding that a Google search for "Jew" turned up the anti-Semitic Web site jewwatch.com as the No. 1 result, New York real estate agent Steven Weinstock launches an online petition asking Google to remove the site. Google refuses. . . . 11th Circuit Court of Appeals in Georgia cites *Wikipedia* as a source in a ruling. A grassroots effort to link the word "Jew" on Web pages to *Wikipedia*'s entry for "Jew" pushes the *Wikipedia* article to the top spot a month later.

2005
Yahoo! indexes more than 20 billion items, including 1.6 billion images and over 50 million audio and video files. . . . Journalist John Seigenthaler Sr. complains about inaccuracies that remained for four months in his *Wikipedia* biography, including a false claim that he was involved in the assassination of President John F. Kennedy. . . . A non-peer-reviewed analysis in the British journal *Nature* concludes that *Wikipedia* and *Encyclopaedia Britannica* have comparable accuracy, but critics say the analysis was flawed. . . . *Los Angeles Times* opens a readers' comment section on its Web site op-ed page, then quickly closes it after it's flooded with obscene comments and pornographic spam.

2006
Wikipedia articles number more than 1 million. . . . *Wikipedia* bans comedian Stephen Colbert from editing articles after he makes joke edits and encourages his TV audience to do so. . . . Thai shopping blog — *Oh See What the Cat Drags In!* — posts photos of coup after military shuts down news outlets.

2007
Ryan Jordan, a member of *Wikipedia*'s Arbitration Committee — a group of experienced users who settle content disputes — is found to be a 24-year-old college dropout, not a theology professor with two Ph.Ds. . . . Number of active blogs stalls at around 15.5 million. . . . California Institute of Technology graduate student Virgil Griffith creates Wikiscanner, computer software that traces anonymous *Wikipedia* edits to the organizations where they originated, often corporations or government officials.

2008
Visits to online U.S. news sites increase by 22 percent over 2007. . . . *Wikipedia* ranks among top 10 most-visited Web sites worldwide. . . . English-language *Wikipedia* has more than 2.4 million articles, for a worldwide *Wikipedia* total of more than 9 million articles in 250 languages. . . . Citizen journalists using the new "microblogging" service Twitter report from the site of a May earthquake in China. . . . German publisher Bertelsman plans to print a book of German-language *Wikipedia* articles, the first time a wiki project will be published as a print product.

How to Improve Your Online Searches

Google has more to offer than you may think.

Yes, Google is a good place to start an online information quest and can provide much more information than many realize. But the number of other sources is almost endless. Here are some tips on improving your searches, starting with Google:

Getting the Most Out of Google

- A Google Alert lets you know whenever the search engine finds and indexes a new Web page on a topic you're interested in, such as blog entries or new videos of your favorite sports team or a research-paper topic. Click the pull-down menu under "more" at the top of the main Google search page, then click "even more" at the bottom of the menu. Then click on "Alerts" to pull up a Google Alert form and fill it out. You can choose alerts for the whole Web, or for news, blogs, videos or discussion groups only, and you can choose how often to receive alerts. Avoid the "as-it-happens" option for most topics, though, or you'll be overwhelmed with e-mails.
- Google allows you to limit searches so they provide information that's most relevant to your quest. For example, typing "intitle:" before your keywords will retrieve only pages with your search terms in the Web page's title.
- You can also narrow your search to a particular Web site or to a particular domain, such as higher-education or government sites. To search only the Library of Congress site, for example, type "site:loc.gov" alongside your search terms, and you'll get back only Library of Congress pages relating to your query. To find your subject on higher-education sites only, type "site:edu" alongside your search terms.
- Typing "phonebook:" and a name in the search box asks the search engine to look up phone numbers. Typing "phonebook:" and a telephone number looks up the name associated with the number.
- Typing "define:" and a word returns definitions of the word.
- Typing "movie:" returns movie reviews. Typing "movie:" plus a movie title and the Zip code or a city name returns a list of local theatres and show times. [1]

Searching Beyond Google

- Some search sites are especially good for certain kinds of searches. For example, a search at www.USA.gov will return U.S. government-sponsored information. A search at www.scirus.com will turn up scientific material only, including journal articles and individual scientists' Web pages.
- To broaden your search horizons, http://bananaslug.com performs Google searches linking your search term to a randomly chosen word to pull up offbeat Web pages on your topic that never would have risen to the top of a simple Google search. "BananaSlug was designed to promote serendipitous surfing: finding the unexpected in the 8,058,044,651 Web pages indexed by Google," say the site's founders. [2]

Computers were originally calculation devices. But humans are social beings with an insatiable desire to communicate, so media and communication uses were quickly devised after the first computers were linked into a network in the early 1970s. [38] The system was built to facilitate high-tech computing and government communications. But, to the surprise of many, high-tech users quickly adapted the network to a down-to-Earth pursuit — sending mail electronically for free. By 1973 e-mail made up 75 percent of network traffic.

By 1975, users, mostly scientists and academics, had developed another new application — mailing lists to broadcast individual messages to large numbers of subscribers. These discussion lists gave users their first taste of the new world to come, in which everyone with a computer could be a publisher. While some lists were work-related, many were not. The most popular of the early unofficial lists was SF-Lovers, a list for discussing science fiction.

With the 1992 introduction of the World Wide Web, Internet users for the first time could navigate among hyperlinked documents, images and multimedia. The explosion of information — plus the ability to place one's own creations online for others to see — drew ever-increasing numbers of the general public onto the Web.

"During the first few years . . . I was a taker; I looked for and found info I wanted," one pioneer computer user told researchers from the Pew Internet & American Life Project. But in the 1990s, "I developed my own Web pages. First for work, then on my own. . . . I became a giver/publisher. What a thrill to contribute." [39]

The flood of people and information online has already changed the world, although much larger effects will surely come, says Fang. "E-mail has so obviously provided for worldwide community," he says, and the Web "has revolutionized commerce as well as propaganda."

"How many blogs are out there? Every political movement, no matter how small, now has one. It has been a godsend to [terrorist] organizations like al Qaeda," says Fang. "Just a few people can create cells all over the world. The Web has given voices to people who could otherwise be heard only as far as they could shout."

- At http://clusty.com, the Clusty search engine returns results listed by popularity but also offers a sidebar that clusters all the search results into categories that may help you more easily find what you're looking for. Search results for the name of a pop singer, for example, may be grouped into categories including photos, lyrics, downloadable music and reviews, allowing the searcher to pull up all Web pages with song lyrics by that singer in a single click, for example.
- To find basic historical information, like what year the Civil War began or what Marie Curie was famous for, historians at George Mason University's Center for History and New Media are developing H-Bot, an artificial-intelligence program that sifts through information from many sites to arrive at the most likely right answer to such questions. Check out H-Bot at http://chnm.gmu.edu/tools/h-bot. Although it can't yet answer "how, where, or why" questions, it claims around 95 percent accuracy for birth or death years of famous people and brief biographies of famous people with relatively unique names and 60-to-80 percent accuracy on simple historical questions like "Who discovered oxygen?" [3]
- Interested in what's going on around the world? Global Voices (http://globalvoicesonline.org), a project of Harvard Law Schools' Berkman Center for Internet and Society, aggregates the work of bloggers and other citizen journalists around the globe to paint a daily picture of world events that goes beyond what mainstream American media publish.
- To search worldwide, pull up Search Engine Colossus (www.searchenginecolossus.com) to find an international directory of country-specific search sites and other online resources for countries and territories from Aaland to Zimbabwe, in English and many other languages.
- Oyez, at www.oyez.org, is a multimedia Supreme Court site where you can read the latest news and information on cases from 1793 to the present and also listen to recordings of recent oral arguments and take a virtual tour of the Supreme Court building.
- It's a wiki world today, with *Wikipedia* just one among thousands of collaborative, user-written sites on every imaginable topic, from Barbie dolls to economic development. User-written media can have the most up-to-date information but may also be only as accurate as the latest edit, which may or may not have been performed by an expert on the topic. For searchable lists, see WikiIndex, at http://wiki-index.org, and Wikimedia's list of the largest wikis at http://meta.wikimedia.org/wiki/List_of_largest_wikis.

[1] Rael Dornfest, Paul Bausch and Tara Calishain, *Google Hacks* (3rd ed., 2006), p. 9.

[2] "About BananaSlug," http://bananaslug.com.

[3] "H-Bot," Center for History and New Media, http://chnm.gmu.edu/tools/h-bot.

Cataloging Information

Having vast quantities of information at one's disposal always has its downside. In a vast sea of data, how do we locate the best answers to our questions? Of the tens of millions of information providers, how do we know which to trust?

"When I was a reporter, the problem was the scarcity of stuff," says South of Virginia Commonwealth University. "I remember going to the [newspaper] morgue and unfolding these yellow sheets of paper, trying to find scraps of information on a city council meeting," he says. "Now, we don't have a drought. It is a torrent," and sometimes that can be overwhelming.

But "scholars have been complaining about too many books and journals since [16th Century English philosopher] Francis Bacon's day," said Christine Borgman, a professor of information studies at the University of California-Los Angeles. "The sifting problem . . . is not new. What is new is the declining availability of indicators to determine what's real, what's true, what's valuable and what will still be there the next time we look." [40]

Throughout history, every time there's been an increase in available information, people have had to invent tools to transmit, store, retrieve and navigate it, as well as gauge its accuracy, says Carolyn Marvin, a professor at the University of Pennsylvania's Annenberg School for Communication.

In ancient Greece and Egypt, for example, cities in developed large libraries, but in those vast collections "no one could find anything, save through extraordinary memory, for . . . there was no efficient system of book cataloging," wrote Steven Roger Fischer, director of the Institute of Polynesian Languages and Literature in Auckland, New Zealand. In the early 2nd century, B.C., the North African writer Callimachus of Cyrene established the first library catalog, at the Library of Alexandria in Egypt. It was divided into sections according to subject matter — such as legislation, medicine, history and philosophy — and the books in each section were listed alphabetically, making the library for the first time "a systematized information center," according to Fischer. [41]

Internet Users Evaluate Sources on Many Levels

Credibility is no longer the only factor.

As the world's information migrates online, Internet users are developing new expectations about information they get and what institutions like newspapers and libraries should provide.

Internet users can now access media of all kinds 24 hours a day, leaving many to tune out some of the old-media mainstays — such as major newspapers and network television — altogether, said Markus Prior, an assistant professor of politics and public affairs at Princeton University.

Traditional newspaper and TV news audiences are shrinking not because "shallow, loud or negative coverage of politics causes viewers to tune out in disgust," said Prior, but because for many people "shallow, loud entertainment . . . is available around the clock" online. [1]

The old notion that readers look for "credibility" when choosing an information source also is crumbling, says John Newhagen, an associate professor of journalism at the University of Maryland in College Park. In the days when television and newspapers were the primary media, he explains, "reaching deeply into primary sources was done for you by people called journalists, and the way to judge the information was something called credibility."

Online media, however, are an interactive experience in which scanning a Web page leads to clicking links and following them to other sites, says Newhagen. Accordingly, "interactivity" — the ease with which an online site allows one to gather the information that meets one's own needs — "may be taking the place of credibility" as Internet users' top criterion for judging media, he says.

"There are so many dimensions of news that can be measured besides credibility," says Erik Bucy, an associate professor of telecommunications at Indiana University. For instance, he asks, "How participatory is the medium? I think that's going to be as important going forward. How engaged am I?"

Having a Web site — or a paper publication — organized to provide clear, easy access to desired content is another important new standard, something that newspapers have not traditionally been good at in their paper editions, says Bucy. "That's another evaluation of news we need to look at. Does [the Web page] allow a quick scan of the news" and provide a clear path for readers to get more of whatever news they care about?

Accepting information as authoritative based on an institutional brand name simply doesn't fly today, says Doug Fisher, a former Associated Press news editor who teaches journalism at the University of South Carolina. "Some of your readers may be blogging and know more than you do," he says, even "if you're *The New York Times* or *The Washington Post*."

New media's credibility is only as good as its latest report. And a willingness to listen to readers' views is another important new standard, he says, "because, frankly, there are a lot of people in the community who know a lot more than you do."

Increased communication between media producers and media consumers is a hallmark of the Internet world, which is far more "social" than past media, says R. David Lankes, an associate professor at Syracuse University's School of Information Studies.

For example, teenagers have told many libraries that they want reading recommendations in the form of blogs so they

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In England in the 11th through the 13th centuries, when written records of legal transactions first became common, retrieval methods taken for granted today — such as dating records and filing and indexing papers by date — had to be invented from scratch, says Marvin.

Over the years, librarians and others have kept improving the ways we catalog information so consumers can locate it. For example, the world's most commonly used library classification system, the Dewey Decimal System, was devised in the 1870s by Melvil Dewey, a 21-year-old student library assistant at Massachusetts' Amherst College. Today the system is in its 22nd edition. [42]

Internet information still awaits storage and retrieval methods equal to the vast volume of data and diversity of authors, Marvin says. And since digital documents are so easy to alter or remove from the Web, "each day's Internet is different," raising new problems of credibility and stability of information, she says. For example, if a writer points readers to a URL (Web address) as a reference today, there's no guarantee that the page will exist unchanged tomorrow.

But retrieval is the biggest problem, says Marvin. Endless information "doesn't do me any good," says Marvin. "The value of information to a society is not that it exists, but whether we can grab that information and use it."

Search Engines Emerge

In the 1990s, technology innovators devised tools to help Internet users locate information in the ever-expanding online universe. [43] These "search engines" travel the Web looking at pages, following hyperlinks from page to page and assembling the pages found into an index that they store. When a search-engine user makes a query, the engine scans its indexed pages and returns a list of those that most closely match the query. Periodic scanning — "crawling" — of the Web keeps the index up to date.

The earliest search engines indexed the titles of Web pages only, but by the mid-1990s numerous engines and

can find out about the person making the recommendations and evaluate them on the basis of their personalities, Lankes says.

The online world also is changing the scholarly enterprise, says Steve Jones, a professor of communication at the University of Illinois, Chicago. For example, soliciting reader comments on scholarly articles is now the norm and greatly expands the universe of people with whom researchers may end up communicating about their work, he says.

"In the long run, the peer-review process is going to change to community review," in which an entire scholarly group will decide whether to publish a paper, rather than just a handful of reviewers, says Jones. That change will have pluses and minuses for research, he says.

"If the research is iconoclastic, the community as a whole will be less likely to be open to it," potentially suppressing the most groundbreaking work, he says. In the past, some seminal research has seen the light of day in scholarly publications only after one influential scholar championed it in the face of general hostility, he says.

On the plus side, the Internet encourages much more collaborative research, as researchers post their data so that others can analyze and build on it. This process is already resulting in "a quite remarkable amplification" of scholarly efforts, says Jones.

Online storage of vast quantities of data — with the expectation that researchers worldwide can easily access it — is one of several new, complex jobs libraries are now being asked to undertake, says Christine L. Borgman, a professor of information studies at the University of California, Los Angeles. Online archivists face a "scientific data deluge" measuring in the terabytes — one terabyte equals 1,000 gigabytes — in fields ranging from astronomy's digital sky surveys to protein science, she explains.

"And managing data" for collaborative use by scholars around the world "is quite different from managing documents," she says. "Libraries are trying to convince researchers that 'I'll give it to the library' is not a data-management strategy" and that libraries need new financial support as science changes to a worldwide data-sharing enterprise.

With all the new expectations, some traditional — and vital — old-media functions are in danger of being lost, says Persephone Miel, a fellow at Harvard Law School's Berkman Center on Internet & Society. "Completeness of local news coverage," which people depend on without realizing it, could become a major casualty, says Miel. "It might be replaced by 10 personal blogs all obsessed with the same local issue," but that would leave many local-information needs unfilled, she says, such as news from zoning boards or local businesses' plans. "In-depth investigative reporting," which takes money, time and, perhaps, special training to accomplish could also be a casualty, along with international news reporting, says Miel.

But the overabundance of information in the online era along with the new expectations of Internet readers "makes it hard to convince people that important things may not be getting done," says Miel.

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[1] Markus Prior, "The Real Media Divide," *The Washington Post*, July 16, 2007, p. A15.

emerged that indexed full text, thus greatly increasing the amount of relevant material they could pull up to answer a query. These engines — including AltaVista and Yahoo! — vied with each other for popularity.

In 1997, Stanford University computer-science graduate students Sergey Brin and Larry Page launched a new engine, Google, as a research project. For the first time, Google "ranked" pages returned in answer to a query based on an algorithm that included information about how many other Web pages linked to the page in question. The method greatly increased the relevance of search results and quickly made Google the most popular search tool — and turned Brin and Page into billionaires.

But search engines are far from the perfect solution to finding good information online.

Perhaps surprisingly, much of the world's information is not yet online. Much more exists in databases that are inaccessible to the public, and some information — such as images and video — remain nearly impossible to adequately index and search.

"We had thousands of years of producing non-digital" material, and at this point academic articles back only to the 1970s have been converted into digital format, says Penn State's Jansen. "A mountain of tough grunt work" remains to be done to convert it all. Until then, "there will be a mixed way of getting information."

At present, automated information searches — unlike librarians — don't understand human language and may often fail to unearth the best available answers to a query. "Ideally, we would understand your question, we would understand all knowledge and match the two," but that vision is a long way from today's reality, said Udi Manber, a vice president of engineering at Google. [44]

For example, in his attempts to improve search, Manber said he's tested Google for queries including "southeast Utah news-airplane crash 10/25/06; hairstyles for ears that stick out; inflammation and pain under my rib; what is answer to this math problem 6x/10x; how many calories in a pound." Of those, Google provided a really

Blog Readers Are Less Up-to-Date on News

The most-well-informed American audiences watch "The Daily Show" and "The Colbert Report" and read major newspapers online. The least knowledgeable audiences regularly view the network morning shows, Fox News Channel and local TV news.

Knowledge Levels by News Source

	High*	Moderate	Low
Nationwide	35%	31%	34%
Among the regular audience of . . .			
The Daily Show/Colbert Report	54%	25%	21%
Major newspaper Web sites	54%	26%	20%
NewsHour with Jim Lehrer	53%	19%	28%
The O'Reilly Factor	51%	32%	17%
National Public Radio	51%	27%	22%
Rush Limbaugh's radio show	50%	29%	21%
News magazines	48%	27%	25%
TV news Web sites	44%	33%	23%
Daily newspaper	43%	31%	26%
CNN	41%	30%	29%
News from Google, Yahoo!, etc.	41%	35%	24%
Network evening news	38%	33%	29%
Online news discussion blogs	37%	26%	37%
Local TV news	35%	33%	32%
Fox News Channel	35%	30%	35%
Network morning shows	34%	36%	30%

* Answered at least 15 of 23 questions correctly.

Source: "What Americans Know: 1989-2007," Pew Research Center, April 2007

good answer only to the inflamed-rib question, he said. [45]

Furthermore, even when search engines do pull up the most relevant pages, the Internet Age "raises to a whole new level" the issue of whether the relevant information is also accurate and reliable, says Virginia Commonwealth's South. Online there's good information — even more of it than in the past — but also "a whole new set of things that are bad, including hoaxes" perpetrated by people "who simply want to mess with your mind," by posting legitimate-looking information that serves some poster's hidden agenda, and "stuff that's well-intentioned but not updated," a special pitfall for Internet users, who tend to assume that all online information is timely, he said.

"Google doesn't give you any sense of the reliability" of the Web sites it lists, says the University of Southern California's Pryor. "Instead, you've got to enter the blogosphere like it's a National Park and approach it like an adventure, going as far and as deep as you can" to develop your own sense of what can be trusted, he says.

In traditional media organizations, for instance, stories are vetted by editors before readers see them, but that's not true with most online information, where the entire burden of credibility checking is left to readers, he says.

Becoming a journalist in the traditional media "has always required jumping through a few hoops" to prove oneself, says Perlmutter of the University of Kansas. "But you can get on the Web and call yourself a journalist" without any scrutiny or credentials. ∎

CURRENT SITUATION

Who Will Pay?

The age of online information is only dawning, so it's no surprise that we haven't yet hit upon the best ways to manage it. But the Internet is changing business and human expectations, as well, and some of those changes are shaking the old information infrastructure to its foundations without providing guidance on how to replace traditional institutions that strove to ensure information credibility, analysts say.

"For the next 20 years, we'll still be in the gestational, learning stage" of the digital era, says the University of Virginia's Vaidhyanathan. "People don't take enough of a historical view" and expect answers too fast, he says.

Part of the process will be figuring out how to pay people to provide organized, reliable information online, or deciding that we are willing to forgo such services because having a vast wealth of information available makes them less important to us.

In the past, taxpayers supported libraries and librarians to collect the

At Issue:

Should online sites like YouTube ban postings by groups the government identifies as terrorists?

SEN. JOSEPH I. LIEBERMAN, I-CONN.
CHAIRMAN, SENATE COMMITTEE ON HOMELAND SECURITY AND GOVERNMENTAL AFFAIRS

FROM THE COMMITTEE WEB SITE, MAY 19 AND MAY 20, 2008, HTTP://HSGAC.SENATE.GOV.

*i*slamist terrorist organizations rely extensively on the Internet to attract supporters and advance their cause. This Internet campaign is described in a bipartisan staff report by the Senate Committee on Homeland Security and Governmental Affairs. . . . The report explains how al-Qaeda manages an online media operation intended to enlist followers. Central to it is the branding of content with an icon to guarantee that the content was produced by al-Qaeda or allied organizations like al-Qaeda in Iraq. All of these groups have been designated Foreign Terrorist Organizations by the Department of State.

Searches on YouTube return dozens of videos branded with an icon or logo identifying the videos as the work of one of these Islamist terrorist organizations. A great majority document horrific attacks on American soldiers in Iraq and Afghanistan. Others provide weapons training, speeches by al-Qaeda leadership and general material intended to radicalize potential recruits.

In other words, Islamist terrorist organizations use YouTube to disseminate propaganda, enlist followers and provide weapons training — activities that are all essential to terrorist activity. The online content produced by al-Qaeda and other Islamist terrorist organizations can play a significant role in the process of radicalization, the end point of which is the planning and execution of a terrorist attack. YouTube also, unwittingly, permits Islamist terrorist groups to maintain an active, pervasive and amplified voice, despite military setbacks or successful operations by the law-enforcement and intelligence communities.

Protecting our citizens from terrorist attacks is a top priority for our government. The private sector can help us do that. By taking action to curtail the use of YouTube to disseminate the goals and methods of those who wish to kill innocent civilians, Google will make a singularly important contribution to this effort.

Google apparently has taken 80 videos off YouTube that violated the company's own guidelines against gratuitous violence. That is a start, but it is not enough. Videos produced by al-Qaeda and al-Qaeda affiliates showing attacks on American troops remain on YouTube's Web site and violate YouTube's own community guidelines. Those should be taken down immediately. Furthermore, Google continues to allow the posting of videos by organizations the State Department has designated as foreign terrorist organizations. No matter what their content, videos produced by terrorist organizations like al-Qaeda, that are committed to attacking America and killing Americans, should not be tolerated. Google must reconsider its policy.

LESLIE HARRIS
PRESIDENT AND CEO
JOHN MORRIS
GENERAL COUNSEL
CENTER FOR DEMOCRACY & TECHNOLOGY

FROM THE HUFFINGTON POST, MAY 28, 2008, WWW.HUFFINGTONPOST.COM

*S*en. Joe Lieberman took a step backward in America's "war on terrorism," by demanding that YouTube censor hundreds of videos allegedly posted by Islamic terrorist groups. And when the Google-owned site responded by promptly removing a large number of videos, which violated its guidelines against hate speech and violence, he insisted that action was "not enough."

What would be "enough" in the senator's estimation? The removal of all tainted videos, even those that were plainly constitutionally protected advocacy, albeit abhorrent, and a plan "to prevent the content from reappearing"?

Civil liberties continue to be a casualty in our efforts against terrorism. So far, broad Internet censorship has not taken root, but censorship is the path we would take if Google acceded to Lieberman's demand.

The system we have devised, in which online services establish rigorous terms of service and enforce them, is a wise one. Users help police the system, and sites that are notified of potentially offensive content generally take down content that violates their rules. In the spirit of self-policing, Lieberman's request to review specific videos is fair, but demanding ongoing review of all videos, and removal of those that don't meet with self-selected criteria, crosses the line. . . .

For the last year, Congress has made the Internet a focus of anti-terrorism activities. The Violent Radicalization and Homegrown Terrorism Prevention Act, which has already passed the House, specifically finds that the Internet "aided in facilitating violent radicalization, ideologically based violence and the homegrown terrorism process in the United States by providing access to broad and constant streams of terrorist-related propaganda."

Congress can take away two diametrically opposed lessons from this finding. The first is that the Internet is an essential communications tool that America should learn to better use to counter terrorism and tout our values. The other is to fight terrorism by censoring the Internet and destroying our first freedom.

Ironically, while Lieberman's letter was being delivered to Google a Senate panel on human rights was hearing testimony on threats to Internet freedom from repressive regimes. Some, like China, have built a network of gatekeepers to block content that challenges the government's official messages. Congress cannot [advocate] Internet freedom with one voice and [call] for censorship with another.

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materials they believed were most valuable and help readers find the ones they needed. Readers' and advertisers' dollars supported book, magazine and newspaper publishing, where editors and publishers chose and vetted writers and texts, publishing those they believed were best. Can the millions of people who voluntarily post content make up for the loss of such services?

Today, "the young generation will not pay for content on the Web," says Messner of Virginia Commonwealth. In part, that relates to another Internet-fueled expectation — that information will be updated nearly minute-by-minute — he says. "If you actually pay for the *Encyclopaedia Britannica*, your entries maybe [were] updated four or five years ago, while *Wikipedia* "is updated with things that happen today," Messner says, and it's free.

"Back in the olden days, people used to pay for newspapers. Now you can find everything for free," said a 19-year-old California man interviewed in an Associated Press survey on young adults' news habits. [46]

The ability of readers to search the Internet for information on their own, coupled with the availability of millions of Web pages appealing to every conceivable interest, also decrease advertisers' willingness to pay top dollar for space in newspapers, magazines or online information sites, say media scholars. That means the editorial judgment that formerly chose and edited news stories for the public often is no longer available.

"The evidence is mounting that the news industry must become more aggressive about developing a new economic model," said the Project for Excellence in Journalism. "Finding out about goods and services on the Web is an activity unto itself, like using the *Yellow Pages*, and less a byproduct of getting news, such as seeing a car ad during a newscast." As a result, advertisers may not need journalism as

they once did, particularly online, depriving news organizations of their most important source of revenue. [47]

The wide variety of information outlets online and the ease of surfing from one to another mean that no one site alone can expect to draw many eyes or hold onto them, another reason advertisers will offer less money for ad placement, says Indiana University's Bucy. For example, "people don't watch MSNBC and then go online to MSNBC's Web site; they go elsewhere online," he says. For that reason, content producers, online and traditional, are seeing ad revenues dry up.

Citizen Journalists

Although much of today's online content is produced by volunteers, many analysts doubt they could fill the information gap that would occur if traditional news organizations go under. It's unlikely that unpaid citizen journalists and other content posters, working as volunteers, would have the same expertise, and professional dedication, to providing accurate, unbiased news coverage on a long-term basis, the analysts say. Much Internet content is in the form of blogs and other sites that don't seek out new information but comment on information turned up by traditional media like newspapers, says Virginia Commonwealth's South. Ironically, that leaves much of the reading audience, especially younger people, "unaware of the sweat that went into the original reporting," making it harder for media organizations to convince potential audiences that their work is worth paying for, he says.

New forms of media are developing, however, including ones staffed mainly by volunteers. Since 2004, so-called hyperlocal media — Web sites where citizens report on community issues, generally on a volunteer basis — "has really been building," says Jan Schaffer, executive director of

Washington-based J-Lab: The Institute for Interactive Journalism. Her group has helped fund 40 hyperlocal projects, but received 845 proposals, Schaffer says.

Hyperlocal bloggers are filling some of the gap left by shrinking traditional-news coverage and also replacing old-media notions of credibility, which many believe have become bankrupt, says Schaffer.

For example, many hyperlocal reporters "have the aspiration to build community," something many feel that old media has worked against, she says. "They're not framing stories as conflicts, and don't do false 'yes-no' equivalencies on issues," Schaffer says. The yes-no paradigm is a traditional media story-telling strategy, intended to eliminate one-sidedness or bias, she says, but the new "citizen journalists" believe the strategy actually harmed media credibility and accuracy because it polarized issues and positions instead of finding the gray areas that often exist.

Some hyperlocal journalists are "getting so much credit in the community that they're being tapped to run for office in some places," Schaffer says.

But many analysts caution against hopes that the news reporting of the future will come from volunteer citizen reporters. "Most people will not become news producers," says Persephone Miel, a fellow at Harvard Law School's Berkman Center for Internet & Society. For one thing, "nobody has that much free time."

Evidence shows that only a handful of people who volunteer — perhaps 10 percent — either have the talent or motivation to produce journalistic-type work in collaborations that have been tried, according to New York University professor of journalism Jay Rosen. [48]

Another barrier to news volunteerism is the very real risk of being sued for libel, especially if reporters challenge powerful interests, as investigative journalists for mainstream media have traditionally done, says Miel. "What do you do when a small publication like

Chi-Town Daily News [in Chicago] ends up with a libel lawsuit, and they don't have the same access to attorneys that *The Washington Post* has?"

Some outside groups, such as the Berkman Center's Citizen Media Law Project, have formed to help citizen media meet legal challenges, Miel says.

In the past, newspapers and other media companies have aggregated news, picking out and publishing what they deem the best material and the most important stories. This media function is also up for grabs online, with some user-based systems of news judgment potentially replacing institution-based ones.

For example, the nonprofit *NewsTrust* aggregates and presents the day's top news on its Web site, gleaned from traditional media Web sites as well as blogs and independent media. Billing itself as "Your Guide to Good Journalism," the site picks out what it deems the most credible stories based on ratings by both site users and a panel of experts. [49] Typically, they summarize the reports and then include a link to the original source, along with a 1-to-5-star ranking from their reviewers.

Nonprofit groups, including advocacy organizations, also may play a bigger role as actual reporters, as revenues for traditional news publishers shrink, even though advocacy groups' biases have long been thought to compromise the credibility of their writings.

Many charitable organizations would find it in their own interest to take on the cost of producing real news rather than the public-relations materials most produce today, said Martin Moore, director of the London-based Media Standards Trust, a new nonprofit group that's seeking ways to build credibility standards into new media. "Charities have an agenda . . . but they are also motivated by a sense of obligation to the public, have a keen interest in seeing injustice reported" and are "already on the ground" in trouble spots, he writes. "Plus, since they tend to wear their agenda on their

sleeve . . . at least you know where their bias is coming from." [50]

Internet companies that depend on paid writers and other content producers to fill the Web with information have a stake in supporting credible journalism and should do so, said Neil Henry, a professor of journalism at the University of California, Berkeley. "It stands to reason that Google and corporations like it, who indirectly benefit so enormously from the expensive labor of journalists," should "somehow engage and support the traditional news industry" as "a public trust to society," he said. If not, "I can't help but fear a future — increasingly barren of skilled journalists — in which Google 'news' searches turn up not news but the latest snarky rants from basement bloggers, fake news reports from government officials and PR cleverly peddled as journalism by advertisers," said Henry. [51]

Others argue that traditional publishing values and organizations can flourish online, supported by advertising dollars, as long as revenue expectations are reasonable. The world of online information is "not the commercial desert it was feared to be a few years ago," says the University of Virginia's Vaidhyanathan. "People can make money" with online journalism, he says, although there are no windfalls any more, since advertisers are abandoning the dream of reaching everyone online and focusing instead on smaller, niche audiences on the Internet.

Online publishers must simply focus instead on content that draws in Internet users, he says. "Advertising is the only possible source of revenue," and "if content brings people to your site, advertisers will want to be there, too."

To create credible forms of media in the online world, "hybrid forms will be the strongest — openness with some controls, amateurs with some pros," said New York University's Rosen. "But that means we have to figure out how these hybrid forms work." [52] ∎

OUTLOOK

Future of Search

The evolution of online searching will shape the future of information. But how that future plays out is anyone's guess.

Today, the world of search is totally dominated by Google, but that may not be true in the future and probably shouldn't be, says the University of Virginia's Vaidhyanathan.

"One of the central philosophical questions about digitizing" existing information is, "Should we focus on quantity or quality?" he says. Google has opted to digitize all the information it can find, rather than choosing the more "important" information first, a smart business move because "the more chaotic the world is, the more we need Google," Vaidhyanathan says. But the result is that "the Internet now feels like some weird combination of library, shopping mall and movie theater," he says.

Vaidhyanathan would like the world of online information to feel more like a library, where the most important works are archived according to a scheme set up by experts. "I'd like to see a publicly funded research system [for digitized, online information] based on collaboration of stakeholders that would be expertise-based and have values built in," such as human rights and privacy, he says.

Digitizing the world's information should be about "making a global library that privileges the needs of humanity over the next 50 years rather than the interests of a company in the next quarter," he says. "I love Google, too, but it's not enough; we shouldn't be relying on it totally."

The future could also bring a more sinister side of search-engine technology into play, says Turow of the University of Pennsylvania.

Search-engine and data-mining technology has "the ability to surround people with information based on what marketers and others think about them," without their being aware of it, he says. Virtually all U.S. media go digital with the analog-to-digital TV switch in February 2009. [53] After that, such clandestine targeting could happen "not just on the Web but on TV" and eventually in magazines and newspapers, which we will access digitally through portable electronic tablets, says Turow.

In fact, such targeting "is already happening in advertising, but it's troubling that people will be labeled and profiled, and, without our realizing it, we'll be sent news and information" as well, based on what someone else wants us to see, rather than what we choose, Turow says. "This is an issue that as a society we need to grapple with." ∎

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Sample formats for citing these reports in a bibliography include the ones listed below. Preferred styles and formats vary, so please check with your instructor or professor.

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