

Wikis: ‘From Each According to His Knowledge’

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Wikis offer tremendous potential to capture knowledge from large groups of people, making tacit, hidden content explicit and widely available. They also efficiently connect those with information to those seeking it.

Much has been written about wikis in recent years by researchers, journalists, bloggers, and wiki software vendors. Not surprisingly, most of this information appears in wikis themselves. Given the explosive growth in wiki applications and the controversies surrounding the technology, it is useful to sort through the claims and criticisms to better understand what wikis are, how they are used, their advantages and limitations, and various issues surrounding their implementation.

WHAT IS A WIKI?

In 1994, Ward Cunningham implemented the first wiki, the WikiWikiWeb, to promote the exchange of ideas among fellow programmers on his consultancy’s website (http://en.wikipedia.org/wiki/Ward_Cunningham). Shown in Figure 1, the WikiWikiWeb was written in Perl and based on a HyperCard stack Cunningham wrote in the late 1980s. Today, wiki software applications are based on numerous languages, including Java, Lisp, PHP, Smalltalk, Python, and Ruby (http://en.wikipedia.org/wiki/List_of_wiki_software).

“Wiki” is Hawaiian for quick, and, as the term suggests, the technology’s initial goal was to give users the ability to quickly put content on the Web. Today, however, a wiki’s purpose depends on who you ask and what kind of application is being developed. In general, wikis are designed to facilitate quick and easy content

- generation,
- collaboration, and
- distribution.

With wikis, multiple users can connect virtually in time or space—from private communities within enterprises to the general public—to create, update, and share knowledge with others.

Wikis typically allow users to

- add new content,
- link to other related content,
- edit existing content,
- organize and structure content,
- view content, and
- access a history of contributed content.

Most wiki contributions are written, but they can include media such as images, videos, and sound files. Web-based documents are created collaboratively in a simplified markup language, or “wikitext,” using a Web browser over the Internet or an intranet. This enables nonprogrammers to create wiki applications and add new features without having to be familiar with the code base.

Wikis use various mechanisms to track the history of contributed content so that users can see who made what changes and when. Figure 2 provides an example of a wiki tool that compares versions of documents.

Knowledge management

Over the years, researchers have offered many proposals to facilitate knowledge management, particularly at the enterprise level.¹ However, the promise of various tools and applications to make tacit knowledge explicit remains largely unfulfilled—much tacit knowledge

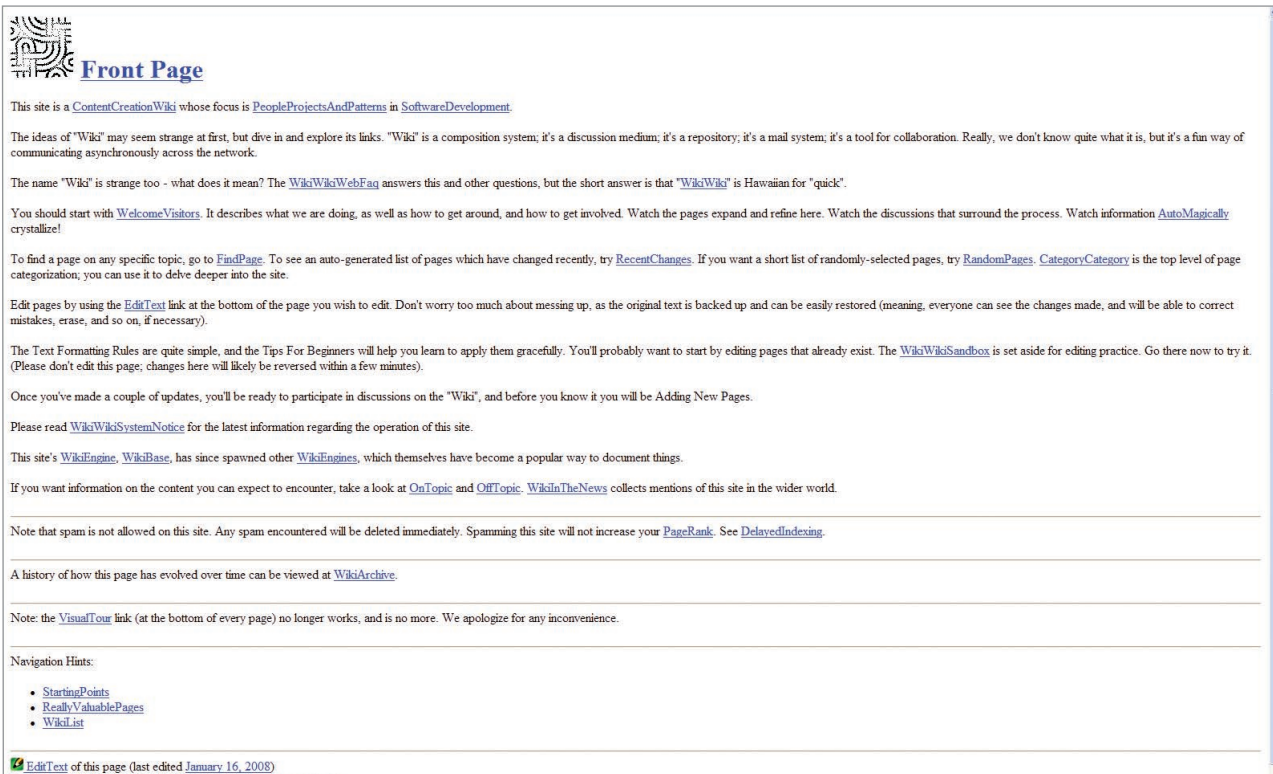


Figure 1. WikiWikiWeb. Ward Cunningham implemented the first wiki in 1994 to promote the exchange of ideas among fellow programmers on his consultancy's website.

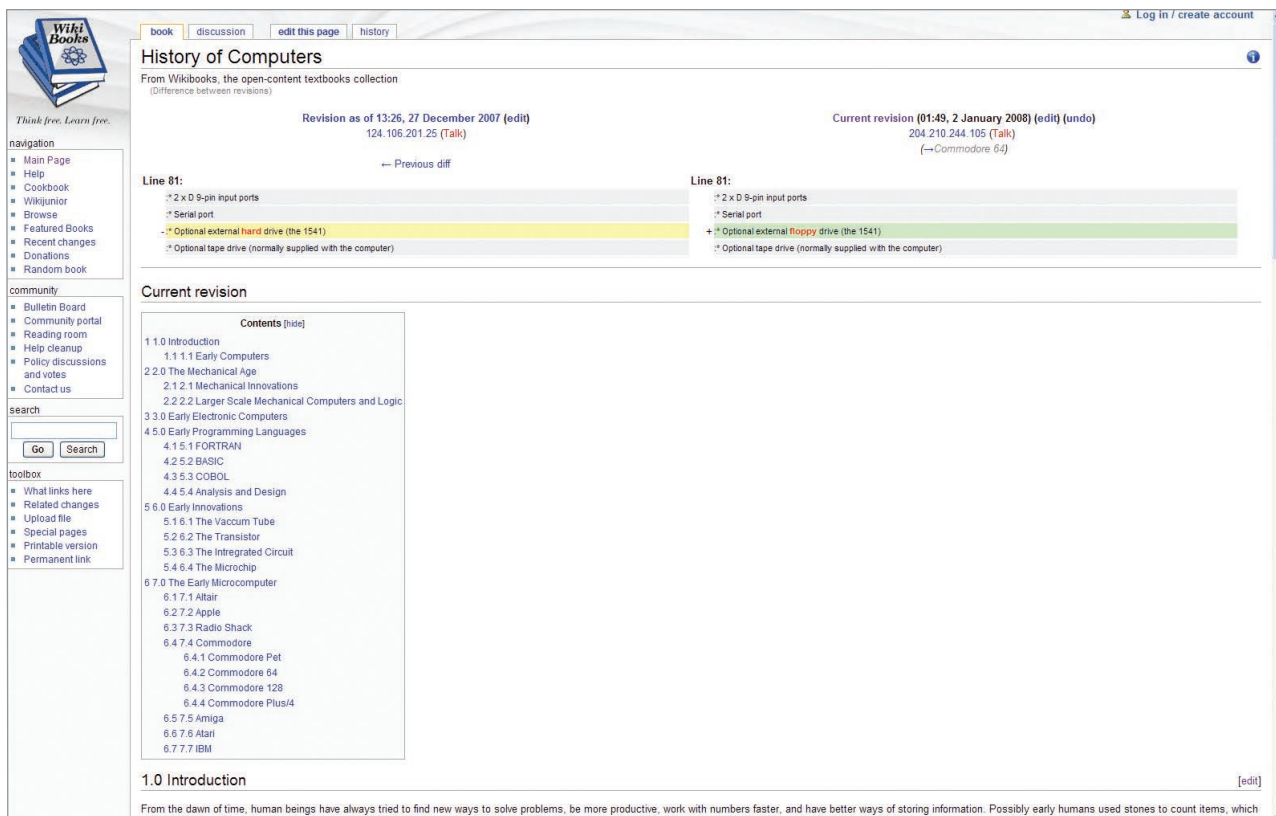


Figure 2. Wikibooks "history" interface. Wiki software allows for version comparisons of documents so that contributors can see who made what changes and when.

remains inaccessible. Wikis have the potential to gather such knowledge from far-reaching sources.

Wikis satisfy four key knowledge management needs by

- capturing knowledge from those who have it,
- converting knowledge into an explicitly available format,
- connecting those who want knowledge with those who have it, and
- linking knowledge to knowledge.²

In classic knowledge management, acquisition experts are responsible for capturing knowledge from domain experts. Wikis offer a nonintrusive means of capturing information by removing the intermediary and letting people share knowledge directly. Wikis also make information or sources exclusively available to the contributor generally available; users thus directly influence the knowledge base's structure and content. In addition, by making available information about contributors, wikis facilitate connections between interested parties. Finally, through the use of hypertext, wikis let contributors link appropriate knowledge.

Wikis all rely on the community at large rather than an elite group to advance knowledge, education, and discussion.

Mass collaboration

Wikis are particularly effective in situations in which a large group of people want to leverage their collective knowledge to achieve some goal. For example, during the 2004 US presidential contest, one campaign used a wiki to compile political news stories for their candidate.³ This approach enabled some 400 staffers to focus on different areas of coverage—for example, around a given periodical. The resulting database served as the basis of twice-daily briefing documents.

Within an enterprise, the choice of whether to implement a wiki depends on the nature of the information as well as the number of users. If a group wishes to keep information private, then wikis, unless tightly limited, are not appropriate as a means of fostering collaboration.

Transparency

To increase participation, content must be transparent; otherwise, multiple participants will not be able to provide coherent and related contributions. Wikis provide transparency by letting users see what others have contributed, thereby converting individual knowledge into communal knowledge.

Pull versus push

Wikis facilitate the connection between those who have information and those who need it. This “pull” mechanism is useful for organizations that want to con-

tinually draw on a dynamic, ordered information set. The alternative is to “push” static, unordered information directly to users, either individually or as a group. E-mail represents the most common form of this approach.

WIKI APPLICATIONS

A broad range of general and enterprise wiki applications is in use today.

General applications

The most well-known general wiki application is Wikipedia, the multilingual online encyclopedia that relies on volunteers from around the world to contribute and edit content on any given topic. Launched in January 2001 by Jimmy Wales, it is one of the 10 most popular websites and currently contains more than 9 million articles in 253 languages (<http://en.wikipedia.org/wiki/Wikipedia>).

The project's tremendous success spawned numerous siblings now operated, along with Wikipedia, by the nonprofit Wikimedia Foundation. These include Wiktionary, a dictionary of term meanings, synonyms, etymologies, and translations; Wikibooks, a collection of open source textbooks and other learning materials; Wikiquote, a compendium of quotations from prominent people and works; Wikisource, a library of public domain texts and other source documents; Wikimedia Commons, a repository of images, sounds, and video; and Wikinews, a source for reports by citizen journalists.

Tens of thousands of independent wiki applications have sprung up on the Web to serve communities interested in broad topics like computing, travel, and entertainment as well as niche subjects such as the online role-playing game *World of Warcraft*. For example, Wikia, a for-profit company cofounded by Jimmy Wales, alone hosts more than 4,700 wiki communities (www.wikia.com/wiki/About_Wikia).

Although some wikis impose restrictions on contributions, all rely on the community at large rather than an elite group to advance knowledge, education, and discussion. The power of wikis to reach a broad constituency has not been lost on technology-minded political candidates, who are beginning to incorporate them into their campaigns (http://vote.peteashdown.org/wiki/index.php/Main_Page).

Enterprise applications

Wikis have many applications within businesses and other organizations.

Wikipedia imitations. The high visibility of Wikipedia has led many companies to replicate this type of application internally.³ These internal wikis are typically designed to support particular functions by letting employees input

information as appropriate in an encyclopedia-like setting. For example, a business might employ a wiki-type product directory to record changes and new offerings.

Meeting setup. Wikis can help mitigate information overload.⁴ For example, they can facilitate meetings by gathering input in advance from attendees and making it generally available. This saves time, particularly in the case of multiday meetings with much to assimilate, by enabling participants to review what others have to contribute prior to the meeting so that they can concentrate on areas that need attention.

Project management. Companies can use wikis to capture information about projects. Participants can post documents and progress reports or generate and massage information related to a project on the wiki. For example, CommSecure, an Australian provider of e-billing and e-payment solutions, employs a wiki to help track the implementation status and related documentation of different projects.⁵ This can facilitate buy-in by letting participants help construct key inputs and making constraints transparent.

Best practices. Employees can use wikis to describe best practices. For example, the wiki “Library Success” is a “one-stop shop for great ideas and information for all types of librarians” (www.libsuccess.org/index.php?title=Main_Page). Another wiki’s expressed goal is to share best practices about the Common Base Event, a fundamental systems management standard (www.ibm.com/developerworks/wikis/display/CBEbestpractice).

Taxonomy development. Wikis can simplify taxonomy development within an enterprise, which generally requires the cooperation of multiple parties. Individual users can propose a portion of the taxonomy and its associated explanation, and others can point out their limitations and suggest changes.

Competitive intelligence. Wikis can be used to gather competitive intelligence, a function traditionally performed by a small group within the organization that acts in relative secrecy. SAP, one of the world’s largest business software companies, employs a wiki to monitor how its pricing tactics and sales strategies are working in the field.³ By making the process open and participatory, the company can get better and more timely collective intelligence and make it available to more people.

WIKI ADVANTAGES AND LIMITATIONS

In determining whether to implement a wiki, an enterprise or other organization must balance the advantages of the technology with its limitations as well as match

WIKI ADVANTAGES

- Wikis generate a network of knowledge by linking people and content
- Wikis can build consensus
- Wikis collect knowledge from multiple sources
- Wikis engage contributors
- Wikis can be as accurate as traditional published sources
- Wikis delegate control to contributors
- Wikis provide a forum to help users manage their behavior

WIKI LIMITATIONS

- Wikis often do not provide author information, raising questions about content accuracy
- Wikis typically lack referees or peer review, which provide some quality assurance
- Wikis can hinder as well as build consensus, focusing on contributors’ conflicting opinions
- Contributors can easily introduce bias
- Wikis can compromise information security
- Wikis can encourage scope creep
- Contributions can decrease over time
- Wikis can expose an organization to legal problems
- Wikis are subject to vandalism
- Wikis can be contrived to look genuine but have an ulterior motive
- Wiki content is generally not available in a machine-processable format

Figure 3. Wikis have both advantages and limitations.

the wiki’s capabilities to the desired objectives. Figure 3 summarizes some of the pluses and minuses of wikis.

Advantages

Wikis offer numerous advantages.

Structure. At the highest level, wikis use a vocabulary or ontology to explicitly organize contributions. However, the use of hypertext to link related concepts and articles within the wiki embeds additional structure. Some wikis, such as Wikipedia, also contain references and external links to other subjects.

Consensus. Wikis can build consensus because many participants often “sign off” on the content. In fact, building consensus is Wikipedia’s “fundamental model for editorial decision-making” (<http://en.wikipedia.org/wiki/Wikipedia:Consensus>). Wikis typically encourage a neutral point of view and have mechanisms to resolve disputes among contributors.

Collective wisdom. Because wikis are generally open, democratic environments, they harness the “wisdom of the crowd.” Ideally, content draws on a wide range of contributors with varying perspectives and expertise. Everyone in the community has an opportunity to evaluate the quality of contributions, and those who have an interest in or are knowledgeable about a topic can add to or modify content.

User engagement. Wikis engage users by letting them express themselves freely and for all to see. Although most wikis have etiquette guidelines and codes of conduct prohibiting, for example, hateful content or personal attacks, individuals generally have tremendous flexibility in what they post. Users derive satisfaction from being part of a communal effort as well as seeing their creativity on display.

Accuracy. Contrary to the claims of some critics, wiki accuracy can be comparable to published sources. For example, one recent study found that Wikipedia had roughly four inaccuracies per entry, only one more than *Encyclopedia Britannica*.⁶ Some wikis have verifiability guidelines that encourage contributors to cite reliable sources.

Delegation of control. Wikis delegate control of content to potential contributors. This is an advantage in organizations where management seeks bottom-up input on particular issues or processes.

User management. Wikis can help manage users as well as contributors by providing widespread access to equivalent standards for actions and behaviors, whether implicitly or explicitly.

Wiki limitations

Wikis also have several limitations.

Lack of authority. Users might want assurance that material they obtain online is backed by some authority or level of expertise. Unfortunately, in many cases there is limited information about authors of wiki material. For example, a Wikibooks contributor named “Psychofarm” has written books on both Mac OS and Asian honey chicken salad, while another has offered works on both physics and accounting. Such broad interests naturally raise doubts as to whether these authors have the necessary expertise.

No referees. Few wikis referee content to any appreciable extent, if at all, because that violates the open wiki spirit. Consequently, there is no guarantee that information in wikis is accurate or even reasonable. Wikipedia, for example, has had well-documented problems with users submitting invalid information.⁷ In contrast, published research is typically peer-reviewed and edited, providing some quality assurance.

“Too many cooks in the kitchen.” Wikis can hinder as well as build consensus. If multiple contributors express conflicting points of view or alternative solutions, the resulting content might be incoherent or focus on differences rather than similarities. Wikis can also misleadingly give the appearance of consensus if only one or a small group of contributors dominate the process early on, thereby thwarting further discussion.

Bias. Although many wikis have policies advocating a neutral point of view, their open nature makes it easy to introduce biased information. For example, a former MTV veejay and podcasting pioneer was caught anonymously editing the Wikipedia entry on podcasting to take credit for its development away from others and inflate his own role.⁸

Information insecurity. Wikis can compromise information security. Organizations often compartmentalize data, giving different pieces of information to different users, but wiki users could inadvertently share data that should not be available to all who have access to

the wiki. For example, Microsoft purposely separates product and market information, and users able to intermingle data through a wiki could gain deep insights into the company’s revenue stream.⁹

Scope creep. Because wiki contributors can range from amateurs to professionals, from beginners to experts, the resulting content might be too amorphous to be of use to any particular group. Scope creep is a common problem on complex projects, and wikis can encourage it by facilitating changes in team composition.

Decreased contributions. Wikis, particularly discretionary ones, can suffer a slow death. In some cases, contributions are initially heavy but subsequently decrease as participants turn to other activities. In other cases, contributions are light to begin with, increase as users familiarize themselves with the technology, and then decline as the uniqueness of the technology wears off. Unfortunately, both scenarios result in a similar outcome: decreased contributions over time.

Legal problems. Enterprise applications such as project management rely on contributors being frank and honest, but openness in company e-mail has led to expensive lawsuits—even in instances with only one recipient of a message. It is easy to imagine how a wiki could, by disseminating sensitive or private data to numerous people, expose an organization to all sorts of legal problems.

Vandalism. Wikis are only as good as their contributors, and these can include users who submit obscenities, personal attacks, and deliberate nonsense. Vandalism has actually forced some organizations to cancel wiki applications. For example, the *Los Angeles Times* closed down its “Wikitorial” feature because of contributors’ repeated use of foul language.¹⁰

Contrived wikis. Because wikis facilitate consensus, some use them to try to generate consensus within an enterprise or the general public. Contrived wikis are implemented by some anonymous source to look like a standard wiki, with open contributions, but are actually not open and designed to influence public opinion.

Human consumption. In general, wikis are generated by and for humans. However, many knowledge management systems, such as rule-based systems, attempt to put information in a machine-consumable format, intermediary to human consumption. Such machine-based consumption is generally beyond the scope of wikis.

IMPLEMENTING WIKIS

Some organizations that implement a wiki might expect to simply “build it and they will come” (and use it). However, the open nature of wikis raises several issues that are often ignored.

Author information. Enterprise wikis usually keep data about wiki authors. As Figure 4a shows, capturing such information can be critical to achieving user

SAP COMMUNITY NETWORK
Welcome Guest

Register - it's free | How to Contribute | Site Index | Languages

SDN Community | BPX Community | Forums | Wiki | Blogs | Articles | Downloads | eLearning | Events | Premium Access Zone | Subscriptions

My Home > Business Server Pages > ... > FAQ > Browser > Information

Business Server Pages Browser

View | Comments | Attachments (5) | Info

Title: Browser [View Source](#)

Author: Brian McKellar Oct 16, 2006

Last Changed by: Brian McKellar Oct 26, 2006

Tiny Link: (useful for email) <https://wiki.edn.sap.com/wiki/x/2As>

Operations: Copy

Hierarchy

Parent Page
FAQ

Labels

Global Labels (1)
bsp_faq

Recent Changes

Time	Editor	
Oct 26, 2006 06:12	Brian McKellar	view changes
Fixed HOME: error from move		
Oct 24, 2006 05:27	Brian McKellar	view changes
Oct 16, 2006 21:01	Brian McKellar	view changes

[View page history](#)

(a)

Contribution Points

User: Brian McKellar
Points: 3,473

Points per categories

Maximum number of point items per category: 20

Date: 1/1/2006 to 1/1/2008 Refresh

Points of date range: 1,127

Forum Points | Weblog Post | Articles, FAQs, How-to Guides, Whitepapers | Code Samples | Additional Points | Wiki

Subject / Title	Development Area / Sub Category	Granted On	Points	Comment
Re: DATE - type in tableview - iterator	Web Application Server Business Server Pages (BSP)	Thu Apr 12 10:26:46 CEST 2007	2	Rewarded with "Helpful answer (2)"
Re: Pro3438:cons of HTTP web service versus FTP interface	Web Application Server Business Server Pages (BSP)	Wed Dec 06 19:30:38 CET 2006	6	Rewarded with "Very helpful answer (6)"
Re: PDF conversion with windows 2000 not working	Web Application Server Business Server Pages (BSP)	Tue Oct 24 16:15:20 CEST 2006	6	Points rewarded with "Very helpful answer"
Re: How to render a radiobuttongroup and radiobutton in a custom extension?	Web Application Server Business Server Pages (BSP)	Mon Apr 17 11:45:46 CEST 2006	2	Points rewarded with "Helpful answer"
Re: Creating First Class	Web Application Server Business Server Pages (BSP)	Sat Apr 08 11:42:33 CEST 2006	2	Points correction
Re: TableView -> displayed rows by filter	Web Application Server Business Server Pages (BSP)	Sat Apr 08 11:40:56 CEST 2006	-10	Points correction
Re: authenticating in a bsp application with links to BW (BEx) Queries	Web Application Server Business Server Pages (BSP)	Sat Apr 08 11:40:47 CEST 2006	6	Points correction
Re: HTMLB Tabstrip: mix of Client and Server Events fails	Web Application Server Business Server Pages (BSP)	Sat Apr 08 11:39:03 CEST 2006	2	Points correction
Re: BSP - Look and Feel / Theme	Web Application Server Business Server Pages (BSP)	Sat Apr 08 11:29:01 CEST 2006	10	Points correction
Re: Calling a BSP from a BW web report RRI	Web Application Server Business Server Pages (BSP)	Sat Apr 08 11:28:52 CEST 2006	10	Points correction
Re: CLASS Method returning a Table to a BSP	Web Application Server Business Server Pages (BSP)	Sat Apr 08 11:26:11 CEST 2006	10	Points correction
Re: Stickers	General Moderators	Wed Jan 04 11:02:12 CET 2006	6	Points rewarded with "Very helpful answer"

(b)

Figure 4. SAP wiki. (a) Capturing author information can be critical to achieving user acceptance of content. (b) Issuing "points" with associated benefits to employees for their efforts encourages participation.

acceptance of content. It can also foster connections between users and authors. Google recognizes this and is implementing its own competitor to Wikipedia, Knol, that prominently displays authors' names (<http://blog-scoped.com/archive/2007-12-14-n19.html>).

Incentives to participate. Wikis should provide potential contributors with incentives to participate. As Figure 4b shows, one way to do this within an enterprise is to issue "points" to employees, with some reward upon reaching a certain threshold, for their efforts. In addition to displaying authors' names, Google's Knol will let authors include advertisements and make money from their contributions.

Administration. Ideally, wikis should have an administrator who referees and manages the changing content. However, if the wiki is substantial, such as

Wikipedia, no one person or even group can monitor all of the changes in real time.

Change alerts. One way to provide control over changes is to alert those who have indicated interest in a particular subject or whose previous contribution has been altered by another user. Participants who know that changes they make to existing content will be broadcast to the original author will likely be more discriminating, while those whose contributions have been edited will have a chance to quickly review the changes for inaccuracies or other issues.

Access and registration. The original philosophy of wikis was to let all users contribute and change content. However, such openness can lead to vandalism, tampering, compromised data, and other problems, particularly

in noncorporate settings where there is little recourse for destructive acts.

In corporate environments, it is important to determine whether wiki access should be open to outsiders or limited to employees, managers, or a select group of users within the company. Does the wiki contain information—for example, about product faults—or controversial content that, if made available to the wrong people, could negatively impact sales, compromise proprietary secrets, or lead to costly litigation?

Perhaps the least intrusive way to control access is to notify potential contributors that their IP address is being captured. Another method is to require that users register with a valid e-mail address and log in with a username and password. Although the effectiveness of these steps can be mitigated, they at least provide some potential control over users.

Contributor capabilities. One way to manage users is to categorize them according to their capabilities. Wikibooks distinguishes contributors according to their fluency in English and other languages. For example, User en-N connotes a native English speaker, while User en-0, -1, -2, and -3 represent users with zero, basic, intermediate, and advanced levels of English, respectively. To limit wiki access in enterprise settings, contributors can be assigned “roles” based on their responsibilities or level of expertise.

User practice. Although most wikis are relatively simple, they can be intimidating to first-time users. Many sites therefore provide a “sandbox” that lets contributors learn the wiki’s various features and practice, thereby limiting potential mistakes. Sandboxes might also facilitate user buy-in.

Policies and guidelines. Wiki contributors should clearly understand what they can and cannot do. The site should therefore offer a list of mandatory policies and advisory guidelines, subject to community approval. For example, Wikipedia users must respect other contributors, respect copyrights, avoid bias, and include only verifiable information (http://en.wikipedia.org/wiki/Wikipedia:Key_policies_and_guidelines).

Copyrighted material. In many settings, wiki-based materials cannot be copyrighted. For example, Wikibooks considers all contributions to fall under the terms of the GNU Free Documentation License (<http://www.gnu.org/licenses/fdl.html>). Wikibooks warns potential violators that “the posting of copyrighted material without the express permission of the copyright holder(s) is possibly illegal and is a violation of our copyright policy” (<http://en.wikibooks.org/wiki/Wikibooks:Copyrights>).

Project completion estimates. Although wikis are typically open ended, some projects can have a completed format. In these cases, providing users with an estimate of how much work has been done can be help-

ful. For example, Wikibooks indicates whether text for any given project is “sparse” (0 percent), “developing” (25 percent), “maturing” (50 percent), “developed” (75 percent), or “comprehensive” (100 percent). Because there are likely to be multiple contributors, and completeness is in the eye of the beholder, estimates can be highly subjective.

Design for participation. Because wikis depend on contributors, any implementation should be designed to facilitate participation. Ross Mayfield, cofounder of Socialtext, the leading enterprise wiki company, suggests starting small with a pilot project that applies a wiki solution to a single process or application.³ Once the project participants have evaluated the tool through a forum or discussion group, they can “take it public” by each inviting five others in the organization to use the wiki. This can be repeated with successively larger waves of contributors, gradually building a community, adding content, and evolving norms.

Personalization. Many wiki applications let users personalize some aspects such as privacy settings, link formats, image size, editing options, browser appearances, date format, and time zone.

EMERGING AI APPLICATIONS IN WIKIS

In simple terms, artificial intelligence aims to incorporate human intelligence into computer-based applications or analysis. There are numerous potential applications of AI in the area of wikis.

Wikis provide substantial structured material about particular subjects, and researchers have used them to generate and maintain ontologies¹¹ and taxonomies.¹² Similarly, group input could be used in a wiki to generate rule-based knowledge to capture insights and identify conceptual relationships. Systems designed to improve knowledge by intelligent questioning and answering could also leverage wiki content.

Just as electronic auction sites generate reliability or quality estimates about buyers and sellers, AI systems could search the Internet and other wikis to find out what particular authors have contributed on various topics and generate trust or expertise indices. Researchers also could develop intelligent agents to search multiple wikis and assemble material for a comprehensive article on a subject.

Wikis such as Wikipedia address the same topics in numerous languages. Researchers could use this multilingual data to disambiguate topics, terms, or words; generate translations; or analyze structure in a subject area.

Researchers also could use AI systems to help secure wikis, whose open nature makes them particularly vulnerable. For example, concept-based systems could identify vandalism and exclude such contributions prior to

Researchers have used wikis to generate and maintain ontologies and taxonomies.

posting, while intrusion-detection systems could leverage information gathered about contributors to unmask illegitimate users.

Wikis can be used as a training ground to search for knowledge obtained through machine-learning approaches. Further, annotating wikis with machine-readable content would make them both human and machine-friendly.

Wikis offer tremendous potential to capture knowledge from large groups of people, making tacit, hidden content explicit and widely available. They also efficiently connect those with information to those seeking it: “from each according to his knowledge, to each according to his need.” Although wikis have inherent limitations that make them inappropriate in certain settings and for some applications, they are likely to replace existing processes and technologies, providing organizations with a wide range of additional capabilities. ■

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