

Why it's not a wiki world (yet)

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In 1995, Ward Cunningham wanted to enable programmers to discuss and collaboratively document design patterns on his website, Portland Pattern Repository. To this end, he created a new kind of server software that allowed any page to be freely edited by any user. He called his new creation a *wiki*.¹ Inspired by this first wiki, a number of other wikis have sprang up, the best known of which is Wikipedia, a free online encyclopedia. In projects like Wikipedia, large groups of people have been able to collaborate with an effectiveness that was previously impossible.

The success of projects like Wikipedia hints at the potential of wikis to greatly increase people's productivity and to transform the web. However, a decade after the invention of the wiki technology, its potential remains largely untapped.

This paper will begin by recounting the short history of wikis. The second section will explore reasons for the slow adoption of wiki technology, specifically: the difficulty of starting a wiki, the radical openness of wikis, the lack of clear authorship, and the social shortcomings of the medium. The third and final section will examine how some of these problems are being addressed and others are not. It will conclude by making the case that while the adoption of some wiki technology is inevitable, it is unclear if wiki technology will be absorbed into existing applications or if it will become an entirely new way of working.

The lineage of the wiki

The wiki was a new solution to an old problem: how can a group of people share a document and asynchronously edit it? With conventional word processing software, an individual would edit a document on-screen. In order to share the document with others, he or she would print it out. In paper form, these documents could be taken on the go, mailed or faxed to friends or colleagues, or marked up for later editing. Paper is widely understood and compatible, but it has limitations. Editing done on paper must be transcribed into the computer. Distributing paper to a large number of people is time-consuming and costly. Furthermore, changes made in parallel by multiple editors need to be resolved manually.

By the late 1980s, desktop publishing had arrived, and editing documents on a computer was becoming more widespread and more important. Still, the basic mechanism of collaboration had not changed. People recognized that "people working together to write a single

¹ From *wiki-wiki*, the Hawaiian word for quick

document is a common occurrence, both in the business and the research worlds” [Fish88], and that the technology of the time impeded collaboration. Early research such as *Quilt* supported asynchronous collaboration through the use of editing marks and comments.

In 1994, Microsoft released Microsoft Word 6, which introduced a feature called Revision Marks (later renamed Track Changes) [Mul04]. The feature would indicate which parts of the document had been edited, and by whom, and it would allow users to accept or reject the changes. This feature made possible asynchronous collaboration among small groups of Word users. However, it made it no easier to actually share the files, so users continued sharing files via email or floppy disk.

Early adopters

When Ward Cunningham launched the first wiki in 1995, it gradually attracted a devoted group of readers and contributors, consisting mostly of programmers. WardsWiki—as it became known—turned into a fascinating and surprisingly broad site about programming and technology.

A wiki is the conceptual descendant of both online communication networks like usenet and application software like the word processor. It makes important improvements over each of these. Compared to Microsoft Word, wikis make documents viewable and editable to much larger numbers of contributors. Moreover, since their interface is HTML and the web, wikis are more widely accessible, with fewer compatibility issues. Disparities between versions of Word and the growing pervasiveness of web access on phones and PDAs make wikis an even more attractive option.

Compared to its online ancestors such as usenet, email, and web message boards, which all enforced a rigid structure, the wiki was much more free-form. Members of the WardsWiki community called this form “document mode,” or the ability to represent an evolving discussion on a topic not chronologically or in threads, but as a document that is incrementally refined [Doc05]. Furthermore wikis are flexible enough that, when appropriate, a discussion can take a more traditional dialogue form. While this lack of structure can lead to a lack of organization, the result is usually more coherent than an email or newsgroup discussion. Moreover, according to the wiki principle of “eventualism,” conscientious

contributors would refactor these thread-based discussions into more concise and useful formats over time.²

WardsWiki had a bare-bones interface on top of a dead-simple implementation: Ward Cunningham described his wiki as “the simplest database that could possibly work” [Leuf01]. It did not support images or even text formatting. But these limitations only encouraged the early adopters, who believed that attractive formatting could only distract from the content. The WardsWiki community grew and flourished.

Inspired by this example, programmers and early adopters started several other wikis to build knowledge bases about various topics. Wikis became popular in the free and open-source software (FOSS) community, where they were ideal for collaboratively discussing and documenting software, particularly given the loose structure of the projects.

The success of Wikipedia

These early software-focused wikis did not attract widespread attention. In 2001, however, the founding of Wikipedia proved to be an important milestone for the wiki community. Jimmy Wales and Larry Sanger initiated Wikipedia with the goal of increasing the amount of free content on the web. Today, Wikipedia is by far the world’s biggest and best-known wiki. As of March 2005, the English-language Wikipedia contains almost half a million articles [Stat05] and has been covered in the *New York Times* and other major news sources.

At the time of its founding, Wikipedia was the first major wiki to appeal to mainstream users, as a general reference source rather than a specific knowledge base about a particular project or discipline. The Wikipedia entry on “Wikipedia” attributes its success to this broad approach [Wik05]. Wikipedia presented a clean, attractive interface with illustrations and photos, in contrast to the stark design and text-only content of WardsWiki and others. It also eschewed a quirky markup system that was a hallmark of previous wikis. In all of these ways, Wikipedia was somewhat less radical than its predecessors, looking more like a traditional web page.

Wikipedia’s content also appeared less radical to the casual observer. While the content found on WardsWiki was (and is) an unfamiliar hybrid of dialogue, documentation, and personal opinions, Wikipedia has a policy that all articles should be encyclopedic in tone. Thus, to the

² In some cases, such manual organization is impractical or tedious. For example, many of Wikipedia’s administrative tasks are coordinated using unstructured wiki pages with elaborate policies and instructions, when a more structured database would be preferable. Jotspot, which calls itself “the application wiki,” has addressed this problem by allowing users to include structured content, such as calendars and to-do lists, as well as unstructured content.

casual user, Wikipedia resembles a bigger, more up-to-date *Encyclopædia Britannica*. By choosing a format that was compatible with the expectations and habits of potential users, Wikipedia catalyzed adoption [Dorf05]. A user is first aware of Wikipedia's usefulness as a reference source, as it provides information that meets existing needs and fits existing search habits (many people first encounter Wikipedia after doing a Google search on a topic of interest). The user only later becomes aware that it is a collaborative effort (which is not in itself surprising for an encyclopedia).

While Wikipedia presented itself to users in a more familiar context, it still has substantial advantages over both traditional word processors and traditional online communication. It enabled collaborative editing on a much wider scale than was previously possible, and allowed online communication outside the rigid chronological structure of message boards and email.

What's wrong with wikis

Despite the benefits of wikis, illustrated by Wikipedia, they have been slow to be adopted. In businesses and universities, people who edit documents collaboratively still generally make annotations on paper or in Microsoft Word. Partly, this is simply because wikis are a relatively new technology and people are slow to change their habits; however, there are a number of specific issues that have stood in the way of widespread adoption:

1. **Adoption is hard**—there is no easy way for a non-technical user to start a wiki
2. The wiki **philosophy of radical openness** is incompatible with existing work habits, especially at corporations
3. Wikis have **no clear authority** because they obscure authorship
4. Wikis are **impersonal, centralized and slow-moving**

The following four subsections will explore how these problems have hampered the adoption of wiki technology in the past. The final section of the paper will examine how some of these problems are changing and others are not, and will consider what types of work wikis will be used for in the future.

1. Adoption is hard

A major reason that the number of wikis remains small is that there is no well-established easy way to set up a wiki site. In contrast, consider the ease of creating a blog. Several websites host personal blogs for free, including LiveJournal, Xanga, and Blogger. To start a

new blog, a user simply fills out an online form. Thereafter, the user can log in and post text and pictures on the blog for anyone to view.

For a long time, no such service existed for wikis. Instead, the task of setting up a wiki was strictly for early-adopter types: one needed access to a server computer, as well as sufficient access privileges and expertise to install wiki software on the server. Because of this, the only way for a corporation to adopt a wiki was through usually-conservative IT departments or through engineers with access to servers; non-technical users could not bring a wiki through the “back door.” Likewise, non-technical individuals had no way to set up a personal wiki. Because the wiki community encouraged people to collaborate, and thus, to concentrate their efforts on existing wiki sites, there was little work toward enabling non-technical individuals to create their own wikis.³

Furthermore, the wiki editing interface has been geared toward early adopters. In his book *The Wiki Way*, Ward Cunningham boasted, “*Wiki is not WYSIWYG*. It’s an intelligence test of sorts to be able to edit a wiki page. It’s not rocket science, but it doesn’t appeal to the TV watchers” [Leuf01, original italics]. Obviously, if wikis are to grow out of the early-adopter niche, they will need to “appeal to the TV watchers.” In attempting to bring wikis to the masses, Wikipedia has dropped the elitist rhetoric, but its interface still requires users to learn a markup language.

2. Philosophy of radical openness

Many wiki proponents are equally strident when it comes to the openness of wikis, declaring that a wiki with restricted access is not truly a wiki. In the corporate world, a few companies are beginning to use restricted wikis on a small scale, either by using password protection or by locating the server on an intranet behind a firewall. These wikis are being used for various purposes, including to document rapidly-changing technology or to coordinate requests for proposals (RFPs) [Wood05]. In the future, large enterprise wiki deployments might require several separate wikis with different levels of access to different data. Thus, security is an important concern as corporations consider adopting of wikis. Since the wiki community has largely scoffed at this issue, it should be no surprise that wikis have not made more inroads into corporations.

In addition to internal wikis, public wikis could also provide great value to corporations by improving communication with customers and fostering a sense of community among customers. However, fluid communication technologies such as blogs and wikis pose a

³ When wikis become accessible to more people, new uses will undoubtedly be found for the technology, just as blogs have expanded in scope from their original purpose of online journals.

challenge to corporations that want tight control over the image they present. Many corporations are already struggling with how to use blogs. While some companies are using employee and corporate blogs to communicate with the public, such blogs are not always viewed as sincere [Wood05]. Furthermore, in a few high-profile cases, employees have been reprimanded or laid off for blogging sensitive information. Clearly, the wiki philosophy is not always compatible with the needs and concerns of businesses.

3. No clear authority

The philosophy of radical openness has caused problems of a different sort for Wikipedia. Because a wiki is synthesized from multiple viewpoints, no single author or editor takes responsibility for its content. As Ward Cunningham acknowledges, this new way can be shocking to new users [Leuf01, p.9]. The lack of clear authorship is particularly challenging when users expect content to be authoritative. As many people, even professional journalists [Snow05], rely on Wikipedia as a trusted information, the project has come under scrutiny.

In most ways, Wikipedia meets users' expectations of what a free online encyclopedia should be. However, because any user on Wikipedia can edit its content, it is difficult to tell who wrote a given passage and whether this author should be trusted. Much of the public discourse about Wikipedia has focused sharply on this issue of trust. Most notably, the former editor-in-chief of the *Britannica*, Robert McHenry, compares Wikipedia to "a public restroom. It may be obviously dirty, so that [the visitor] knows to exercise great care, or it may seem fairly clean, so that he may be lulled into a false sense of security" [McH04].

Of course, the reliability of many Wikipedia articles does not compare with that of the *New York Times*, but a more interesting comparison is with the rest of the Internet. Many non-wiki websites contain outdated, false, or biased information; it is up to the user to judge the trustworthiness of the website and its author; however, the identity of the author is always clear. On Wikipedia, it can be considerably more difficult to ascertain the reliability of information. For example, for a few hours on 12 Mar 2005, the article about Bush stated that it had been "falsely alleged" that Bush skipped over the waiting list to join the National Guard in 1972. A user reading the article at this time might believe that it had been refined and approved by myriad users and is therefore trustworthy and uncontroversial. In fact, the article was in a period of flux, and was not uncontroversial at all. A savvy user could look at an article's history to determine how long ago a sentence was written and by whom, but there is no way to tell at a glance what content has just been added and what has stood the test of time. Thus, wikis sometimes exist in an odd state between subjectivity and objectivity; by comparison, blogs do not have the same ambiguity.

Partly, the difficulty of determining authorship is inherent in any collaborative work. People are well practiced at developing nuanced models of trust when dealing with individuals; for example, a person might have no special regard for a historian's cake recipes or for a chef's opinions about the Vietnam War. This same type of reasoning is possible when weighing the opinions of a political blogger and a culinary blogger, but it is very difficult when judging the reliability of a Wikipedia article. The difficulty of evaluating the reliability of a group of collaborators is proportional to the size and diversity of that group; for example, it's easier to determine how much to trust content on WardsWiki, which is mainly frequented by programmers, than on Wikipedia, which attracts a wide array of users⁴.

In some ways, then, wikis are better suited to more homogeneous communities, less controversial topics, and uses that do not require a great deal of authority. This view is actually quite compatible with many wikis; for example, WardsWiki is more like a town square than a reference document, and although many articles consist of a single synthesized viewpoint, the tone is thoughtful more often than it is encyclopedic. In fact, on its front page, WardsWiki is described as an "informal history of programming ideas" [Wel05], which contrasts with Wikipedia's mission to be formal, encyclopedic, and comprehensive.

Wikipedia's growing popularity indicates that many people find it adequate, and the more contributors Wikipedia has, the better it is likely to get, so current trends are in its favor. It is possible that wikis, like blogs, will simply be viewed as reliable enough for most tasks, despite the ambivalence of traditional media. Still, public perception of Wikipedia's reliability is important to the whole wiki community. If Wikipedia continues to draw high-profile criticism, it may reinforce an image of wikis as unfit for serious uses.

4. Impersonal, centralized, and slow-moving

While wikis and blogs raise some similar issues about authority and trust, in many ways the two technologies are opposites. Blogs are highly personal, chronological, and decentralized, while wikis are shared, slowly evolving, and tend to centralize the efforts of many people. Another major difference is the speed of adoption; while blogs have spread like an epidemic in recent years, wikis have been slow to catch on, even though they have existed for ten years.

⁴This issue is not confined to the web; traditional publications often try to maintain a single editorial voice despite being the product of many writers. An extreme example is *The Economist*, which does not disclose information on the authorship of individual articles, instead attributing them all to the staff at large. This works well for traditional publications that are written by a small group of writers under the leadership of an even smaller group of editors, but is more challenging for a large wiki project.

The ease of starting a blog is one reason why blogging has been so contagious, but it is not the only reason. We must also consider why people are motivated to start blogs. According to an ethnographic study of bloggers, there are “five major motivations for blogging: documenting the author’s life, providing commentary and opinions, expressing deeply felt emotions, working out ideas through writing, and forming and maintaining communities or forums” [Nar04]. In other words, blogging is a *social* experience.

While the wiki philosophy places a high value on expressing ideas and opinions, wikis are not a social medium. While a blogger has almost total control over a blog’s content, a wiki contributor relinquishes control over his or her words as soon as they are posted. Even to an experienced wiki contributor, it can be painful to see one’s carefully-crafted prose mangled by another user. The “Wiki Philosophy FAQ” on WardsWiki explains, “This wiki community generally discourages individual ownership of contributions, especially anonymous ones. The idea is that by leaving our egos out of the discussion, the ideas will be given full attention” [Phil05]. While leaving ego—and identity—out of the discussion encourages intellectual discourse, it also makes wiki use less of a social experience.

Another motivation for a person to start a blog is to create his or her own corner of the web. A blogger can customize a blog’s appearance, and he or she alone has control over what appears there. On the other hand, in contributing to an existing wiki, a user participates in a shared space where he or she has little control of style or format. In part, this desire for control is what leads people to start their own wikis. Blogger and engineering manager Leigh Dodds, introducing a wiki into his company noted that , “users new to a Wiki environment expect it to be more like a website: they wanted one of their own” [Dod05].

This leads to the problem of the wiki ghost town: an individual may want to start a wiki, but if that wiki has no contributors, it may not be very useful. There is no instant gratification to be found in starting a wiki; in fact, even new wikis started by the high-profile Wikimedia Foundation, such as Wikinews, are slow to become useful. On the contrary, a blog with one or two readers can look just as good, and can be just as interesting to read, as a blog with millions of readers. This lack of instant gratification is not just a “marketing problem” to be overcome in encouraging adoption of wikis. Rather, it is a question of usefulness that is fundamental to wikis: each wiki must combat its own network effect, as a wiki is not useful until it reaches a critical mass of contributors. In fact, in Dodds’s story, each department ended up with its own wiki, but most of these wikis failed to achieve critical mass and eventually became ghost towns. Only the wiki for the engineering department survived,

indicating that it is easier to build a wiki community if potential users enjoy using technology for its own sake.⁵

Even once a strong wiki community exists, the community is based mostly on investment in a shared effort rather than personal connections. The social interaction that does occur in wiki communities generally occurs only at the margins, for example in user pages and talk pages on Wikipedia. In the adoption of wikis, the solitariness of the experience is a handicap. Blog technology is quick to spread through existing social networks: “People typically found blogs through other blogs they were reading, through friends or colleagues telling them about their blogs or those of others, or through inclusion of the blog URL in an instant message profile or a homepage” [Nar04]. This lack of social context in wikis can impair cooperation. With traditional methods of collaborative editing, such as marking up paper or even forwarding a Word document via email, much important communication occurs outside the confines of the document. When this social context is not available, social protocols can break down: for instance, in a wiki “revert war,” two contributors with differing views engage in a tug-of-war over the content of an article. To prevent or resolve such situations, wikis rely heavily on the aforementioned user pages and talk pages at the margin of the wiki, but these lack much of the fluidity of face-to-face collaboration and private emails.

Furthermore, once a person finds a few favorite blogs, checking them becomes part of his or her daily routine. Since blogs are chronologically organized, they encourage frequent updating and frequent reading. On the other hand, most wikis possess a Recent Changes page, and a few have experimented with a more chronological structure, wikis generally are not ideal for frequently-updated content⁶, and do not encourage frequent checking.

Crossing the chasm

Many of these obstacles to wiki technology entering the mainstream are being slowly overcome. As people realize the potential demand for wiki collaboration tools, the process of starting a wiki is getting easier. Today, a few companies are offering wiki hosting services. Wikicities, founded by a group of Wikipedia veterans, provides advertiser-supported hosting

⁵ Certain types of wikis may be useful without an active community. For example, a wiki that is created primarily to make available existing reference material may be quickly adopted as a reference source and more slowly adopted as a wiki. Allowing people to become familiar with a wiki first as a passive reader is actually a good approach, as Wikipedia has demonstrated.

⁶ On the other hand, blogs are not ideal for organizing permanent content, even though they are sometimes used to do so. It seems likely that wikis will take over in these cases, or that such blogs will become more wiki-like.

for wiki communities that meet their guidelines (for example, they host a wiki for Mac users, one for fans of the video game Doom, and another for residents of Calgary). A company called Socialtext offers a subscription-based hosted collaboration tool targeted at enterprises. Jotspot, a site that offers wiki hosting to any individual or corporation with a number of extra features like email and calendar integration, is in a free public beta as of March 2005, although it plans to ultimately charge a subscription fee. It seems inevitable that free, publicly-available wiki hosting services supported by advertisers will eventually be offered, as they are for blogs.

Wikis are not only getting easier to set up, but also getting easier to use. Newer wiki server programs increasingly emphasize images and attractive formatting. A few of them even include a WYSIWYG editing interface, for the “TV watchers.” There remains a debate in the wiki community between those who believe that wikis are too ugly and those who believe that ugliness is an essential characteristic of a wiki [Ugly05]. It seems clear, however, that the influence of the diehard text-only crowd is waning as the wiki community opens up to non-geeks, likely spurred on by the popularity of Wikipedia. As the barrier to wiki adoption is lowered further, this trend will continue.

As a result of this progress, wikis are being increasingly adopted by corporations to build and maintain knowledge bases [Wood05]. While some wiki proponents have objected that such corporate systems violate the spirit of wikis, there also signs that the wiki community is becoming less dogmatic when it comes to the philosophy of radical openness. For example, “Wikipedia 1.0” version is being frozen and reviewed for quality with the intent of creating a print or DVD distribution of Wikipedia. Larry Sanger and others have gone further and called for a stable version that has been reviewed for accuracy by experts [Sang04]. The anti-corporate attitude of the Wikimedia Foundation, which runs Wikipedia, may also be changing, as it is considering accepting an offer of web hosting from Google: while this offer would not bring advertisements to Wikipedia, it could nonetheless signal an important cultural shift [Goog05].

There are a number of technical methods that Wikipedia could use to increase transparency and user confidence. For instance, contributors to Wikipedia could be required to sign any edits with their real names, much as Amazon.com favors reviewers who provide their real names. Such a policy would not only prevent casual vandalism; it would also encourage contributors to defer to other users with expertise in a subject matter (once that expertise could be established and verified). After all, the community model works very well for improving an article, as long as conscientious members of the community are aware of the problems. This is well demonstrated by blogger John Udall’s short movie about a Wikipedia

article entitled “Heavy metal umlaut” [Uda03]; obvious problems with the article, such as instances of vandalism, are corrected within minutes, while more subtle problems like poor organization, or misleading information (such as one contributor’s assertion that the heavy metal umlaut has a Nazi connotation), take longer to fix. As mentioned before, improving the reputation of Wikipedia would improve the prospects for corporate wiki technology.

The scope of wiki technology

If wiki technology does succeed in crossing the chasm, what tasks will it be used for? As we noted earlier, wikis present substantial improvements over their two ancestors: word processing and message boards. Still, it remains unclear exactly how much and for what tasks wikis will be adopted.

We first introduced wikis in the broader context of collaborative editing. We can divide collaborative editing tasks into two general categories: large projects which were previously impossible or impractical, and small projects which are currently accomplished using other tools.

To date, wikis have mostly been used for tasks in the former category. The fact that these projects did not previously exist means that people did not need to be convinced to abandon their old way of doing things. Wikipedia is one such project that would have been impossible without wiki technology.⁷ Such projects have demonstrated the effectiveness of wiki technology in this role, concerns about authority notwithstanding. As wiki interfaces and hosting services mature and people think of new and inventive uses for wikis, it seems almost certain that the province of wikis will expand to include projects that have not previously been attempted.

For the latter category of existing creation tasks, however, wikis have so far failed to make inroads. People continue to create most documents in Microsoft Word. If they need to collaborate, they either print out a hard copy and make written annotations or email files around and make annotations using Track Changes. There is no doubt that for small groups of people, hosting a document as a wiki page could improve cooperation. However, since wikis do not excel at social communication, they need to fit within the existing social framework of collaborative environments.

Paper is part of this environment. For one thing, wikis need to respond to the challenge of producing useful printed output. Furthermore, Word’s use of a paper metaphor to present

⁷ In fact, it was impossible; the founders of Wikipedia had attempted to build a free encyclopedia called Nupedia without the use of wiki technology, but the project failed.

documents from creation to completion also sets it apart from wikis. Even though many of the documents that people produce in Word are not intended for the printed page, people consider paper documents to be polished and permanent, and web pages to be dynamic.⁸ This psychological boundary may make people reluctant to format polished documents as wikis or web pages.

The future of wikis

This is not to imply that the scope of the word processor will remain forever fixed. In fact, it has shrunk in recent years as more content takes the form of email, blogs, web pages, and a few wikis. As wikis become more pervasive and easier to set up and use, people will naturally adopt them for a larger range of tasks. However, the line between documents destined for paper and those destined for the web will not soon disappear.

Either way, market reaction will clarify the role of wiki technology. If Microsoft views wikis as a threat, the competitive landscape may resemble that of the pen-based computing market. In the battle, Microsoft sought to portray pen features as a mere extension to Windows, while GO Corporation pitched it as an entirely new type of computing [Kap196]. Microsoft may attempt to similarly reframe the wiki as a mere extension of Word. Whether Microsoft succeeds in doing so will have a major effect on where people draw the line between the desktop and the web.

Inevitably, though, the ease of collaborating using wikis will cross the chasm. Wiki-inspired functionality will likely be incorporated into word processors or blogs. Documents in the future will be editable and viewable by a large number of people over the Internet. This new technology will result in more large knowledge bases like Wikipedia and WardsWiki, and will also affect the way people work on smaller-scale projects, many of which will be less open than today's wikis. Whether the wikis of the future will look like today's wikis, or even be called wikis, remains to be seen.



⁸ This association is not always subconscious; it can be quite intentional. For example, people often publish forms, papers, or brochures on the web as PDF files in order to achieve the polished, finished appearance of paper

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