

## Using Wikis as a Low-Cost Knowledge Sharing Tool

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### Abstract

Organizations large and small are struggling to retain their “corporate memory”. In a paper presented at the 45<sup>th</sup> INMM Annual Meeting, the authors advocated “guerilla knowledge gathering” – a technique of gathering valuable corporate data using low-cost, low-tech methods. This paper describes some of the next logical steps – storing, organizing, and sharing the data, information, and knowledge.

For smaller organizations, or small groups within a larger organization, the acquisition costs, the learning curve, and the administrative overhead for proprietary knowledge management systems make them impractical to use. This paper describes a low-cost, low-overhead alternative: a WikiWikiWeb - more commonly called a wiki. A wiki is a web-accessible, shared authoring environment, designed for collaborative document creation.

Wikis, and their close cousins, blogs, are deployed by thousands of individuals and organizations. Wikis are being used daily to share knowledge in many fields. Although they look like any web site, wiki content can be changed, augmented, or deleted by any of its authorized users using nothing more than a web browser.

The authors describe their experiences using a wiki to prepare and upgrade task-based training courses for IAEA inspectors. The wiki was used both as a repository for the training materials as well as a daily communication vehicle for multiple co-authors working in Canada and Austria. The paper compares and contrasts the capabilities of the wiki against other approaches such as email, corporate server farms, intranet web sites, and bulletin board systems. The authors also address the security concerns of IT departments regarding wikis.

The paper concludes with several case studies describing the experiences other organizations have had with wikis.

## 1 Introduction

As the baby-boom generation passes through the workforce, many organizations are finding that significant numbers of knowledge workers are retiring. These retirees represent not only lost manpower, but also lost knowledge. In a paper [Ref. 3] presented at the 45<sup>th</sup> INMM Annual Meeting, the authors advocated “guerilla knowledge gathering” – a technique of gathering valuable corporate data using low-cost, low-tech methods. This paper will describe one of the next logical steps – sharing the data, information, and knowledge that has been gathered.

Knowledge management systems must deal with at least three classes of knowledge: task-based, job-based, and philosophy-based knowledge. In this paper we are concerned with task-based knowledge that can be used for training development. Several papers presented at previous INMM conferences have detailed the corporate framework and methodologies to implement knowledge management systems [Ref. 1, 2].

However, implementing such systems can take considerable time, and during the ramp-up important assets can be lost. Employees with key skills and knowledge may retire, relocate, or leave the organization. In many cases, key corporate knowledge is distributed among several employees and what is required is a system or tool that allows them to collaboratively produce documents that encapsulate their knowledge.

This paper describes some technology and techniques that can be used to capture and share this vanishing knowledge in a central repository, enabling workers to harvest data, information, and knowledge before it escapes the corporate domain. Although the harvest may initially appear haphazard, it is information-rich and can provide otherwise unobtainable source material for later integration with corporate knowledge assets.

## 2 Knowledge-sharing methods and technologies

Knowledge workers use many ad-hoc and formal knowledge-sharing methods and technologies. Some of the most common are:

- E-mail
- Face-to-face meetings
- Phone meetings
- Integrated knowledge management systems
- Web sites
- Electronic bulletin board systems
- Blogs

### 2.1 *E-mail*

E-mail makes it simple to share documents, photographs and other assets with your coworkers. E-mail also makes it simple for you to be swamped with an unending tide of irrelevant messages. One of the major disadvantages of e-mail is that it only provides local history - that is, history for the persons who send or receive the e-mail. It is difficult for an employee coming into the middle of a long discussion that has gone on via e-mail to pick up the thread. Rarely is there a central repository where they can look up these

conversations. Standard e-mail provides very little structure for the information that is being shared.

### ***2.2 Face-to-face meetings***

Face-to-face meetings are often the most fruitful methods of exchanging information. However, unless individuals involved in the meeting take notes (which they later share) there is no history of the discussions that have gone forth. The knowledge has been shared, but only amongst the attendees. Highly structured meetings may have a recording secretary or use recording equipment to capture information for later use and distribution.

### ***2.3 Phone meetings***

Like face-to-face meetings, phone meetings can offer fruitful exchanges of information. Whether that information is put into a form that can be shared and later distributed depends entirely on extra efforts from the participants. Where face-to-face meetings typically have an agenda distributed in advance, and may have summary notes distributed after the meeting, these are rarely features of phone meetings.

### ***2.4 Integrated knowledge management systems***

There are many proprietary integrated knowledge management systems available. There are also proprietary and open-source “groupware” products. Most of these systems are predicated on the idea that the entire organization or a significant portion of the organization will adopt the software and methodologies used. For smaller organizations, or small groups within a larger organization, the acquisition costs, the learning curve, and the administrative overhead for proprietary knowledge management systems or groupware products make them impractical to use. Because the benefits are long-term, organizations that require short-term results may be unable to justify using such systems.

### ***2.5 Web sites***

Corporate intranets (web sites) offer excellent facilities for knowledge sharing. Web sites provide a central information repository that is particularly valuable for organizations with dispersed workforces. To be most useful, the web site needs to have easy navigation and excellent search capabilities.

The disadvantage of most web sites is that they are a centrally controlled, broadcast-only medium. That is, there is no way for users to contribute to the content of the web site except through indirect means. As a simple example, if an employee’s name is spelled incorrectly on a web page, they typically have to send an e-mail to the webmaster to have it corrected at some later date.

Many web sites are now developed and deployed using so-called “content management systems”. Some of these software products have steep learning curves that make them impractical for most small organizations or workgroups. Content management systems are generally geared to centrally controlled web sites with a limited number of trained authors or webmasters.

## ***2.6 Electronic bulletin board systems***

Electronic bulletin board systems are specialized web sites that allow user contributions. These systems offer many of the advantages of static web sites, with the additional benefit of allowing users to interact with each other. In some ways, bulletin board systems are like a combination of e-mail and a web site. As a topic is discussed, users' comments are added to the bottom of the page. This last-comment-at-the-end presentation can lead to extremely long discussions where the central point wavers back and forth without resolution. Where resolution has been reached, it is often difficult to see the wheat amongst the chaff.

## ***2.7 Blogs***

Blogs (more properly known as weblogs) are web-accessible online journals used to record information in a more-or-less chronological order. In general, blogs are intended as broadcast media, with few authors preparing information for many readers. Thousands of individuals and organizations use blogs as inexpensive content management systems for web sites. Many blogs have feedback features that allow users to rate or comment on existing material or even add new material to the blog. As a result, many blogs are a combination static web site and dynamic electronic bulletin board.

## **3 The WikiWikiWay**

An ideal solution to the knowledge-sharing problem would be a system that combined all of the advantages of e-mail, web sites, content management systems, electronic bulletin board systems, and blogs while providing some of the immediacy of face-to-face meetings and phone calls. The authors propose that wikis offer such a solution.

Wikis are not a new phenomenon, but their power and utility have become evident recently with the ascent of the Internet-based encyclopedia, Wikipedia [Ref. 6] and articles about wikis in the popular press [Ref. 5]. The first wiki was created by programmer Ward Cunningham in 1995. The "full" name for wiki is WikiWikiWeb, where "wiki wiki" is a Hawaiian term meaning quick.

Wikis are a shared authoring environment, available over the Internet or on a local intranet, that can be accessed and modified using nothing more than a browser. Wikis do not require any central control or webmaster. The group working on the wiki owns the content collectively. If a group member has content to add or wishes to change existing content, they simply do so.

Wikis have very shallow learning curves. If you know how to use a browser, you can read the wiki content. If you can do simple word processing, you can edit the wiki content.

However, we have discovered in our research that the WikiWikiWay is not always direct or simple. To try and make things direct and simple, we are proposing the following "secrets of success with wikis".

### ***3.1 Make sure your wiki favors authors***

Choose wiki software that makes it easy for authors to edit content. Some wikis use editing schemes that are daunting for new users. Simple editing techniques will encourage contributions from authors.

### ***3.2 Provide a good introduction***

The first impression an individual gets when introduced to a wiki influences their long-term acceptance of them. Where possible, provide a hands-on walk-through. Be sure to emphasize the immediate positive benefits provided by wikis.

### ***3.3 Learn and share the wiki culture***

Wikis are a *collaborative* authoring environment. Make the wiki yours. Encourage others to take ownership of the wiki too. Emphasize that you can edit or contribute to any of the content. Don't complain about things you think are wrong - change them!

### ***3.4 Make the wiki central***

Make sure that the wiki becomes the hub of your knowledge-sharing efforts. If people phone you or e-mail you asking for information, tell them where to find it on the wiki. If you have documents to share with others, post them on the wiki.

### ***3.5 Appoint a wiki librarian***

Because individual contributors often concentrate on a single area, having an editor or librarian who can tie all the pieces together is essential. The librarian does not necessarily need to perform traditional editorial duties. They do need to organize the information and provide links where necessary. In our experience, the lack of a librarian is the single most common cause of failure for wikis.

## **4 Technical details about wikis**

Wiki users do not need to know any of the technical details behind the operation of a wiki. For the benefit of future wiki administrators or individual wiki advocates, the authors have put the technical details on a web-accessible wiki [Ref. 7]. You may need help from your webmaster or IT department to do the initial set up a wiki. Once it is running there is usually no further need for support. There are literally hundreds of different wiki software packages. Some of these are commercial packages with full support provided by the vendor. The vast majority are open source and free software packages.

Some wiki administrators have been able to put all of the software required to run a wiki onto a memory stick. This so-called "wiki on a stick" can be used with a laptop computer as a mobile personal knowledge-gathering appliance.

## **5 Security and openness**

Because wikis are intended as open authoring environments, many IT departments view them as security risks. Wikispam and wiki vandalism are definitely problems on public, open wikis. (There are many techniques used to combat these problems that are beyond the scope of this paper.) Wikis on corporate intranets generally do not have these problems because access is limited to employees and normal web logs and server security provide an audit trail. Additional security for wikis can be provided by the wiki software, by the web server, by the network, and by the wiki "history" feature.

### ***5.1 Security by wiki software***

Most wikis are designed to be completely open, so that any user can edit the content. Since there are some pages that should probably not be edited (such as use instructions), many wikis allow you to protect pages using a simple password system. However, wiki culture strongly supports open editing by any user. The Wikipedia [Ref. 6], with close to 600,000 pages, has only about 30 pages protected from editing.

### ***5.2 Security by the web server***

The web server can provide another layer of wiki security. Standard web server username and password access schemes can be used to restrict access to various sections of the wiki. If necessary, a secure connection (https – the type used in electronic banking) can be used.

### ***5.3 Security by the network***

Wiki security can also be provided by the network. In the case of an intranet, access to the wiki web server can be restricted by placing it on an isolated subnet. In the case of a wiki that is accessible from the Internet, VPN tunneling can be used to provide a secure connection to outside users.

### ***5.4 The history function***

One of the most amazing features (and often the least understood) of a wiki is the history function. Wikis keep *every* version of all the pages on the wiki. Wikis can show you the entire history of changes made to a page and allow you to “rollback” a page to any of its previous states.

From a knowledge management perspective, the history function is a rich source of information, because it allows users to see the “discussion” and edits that went into the current state of the page. From a security point of view, the history function preserves all of the content, and allows easy removal of accidental or purposeful defacement [Ref. 8].

## **6 Case studies**

### ***6.1 Wikipedia***

One of the best examples of successful collaborative knowledge sharing is Wikipedia ([www.wikipedia.org](http://www.wikipedia.org)). Wikipedia is a free, web-based encyclopedia that anyone can edit. The English version was started in 2001, and as of June 2005 it contained close to 600,000 articles. The German, French, and Japanese versions of Wikipedia each contain over 100,000 articles. There are versions of Wikipedia in more than 60 additional languages, each with thousands of articles.

### ***6.2 VIFM workshop redevelopment for the IAEA***

The authors made themselves guinea pigs by using a wiki to share information during the redevelopment of a training workshop for IAEA inspectors. It immediately became evident that the wiki could be used for 3 other joint IAEA and CSSP (Canadian Safeguards Support Program) projects, including the production of this paper!

The wiki librarian created the initial home pages for each of the 4 projects. The librarian also created personal profile pages for each of the authors who had access to the wiki.

Authors in Ottawa, Canada and Vienna, Austria were able to share files and change page content (including their profiles) as required. The pages also became mini project management centers with listings of milestone dates and progress reports.

Security for the content is provided by the web server – each author has their own password. The wiki software detects the log on name of the author and automatically uses it to tag any changes the author makes. The wiki software also provides a “recent changes” summary that allows a quick review of items that have been updated.

Because a wiki is really a web site, it was possible to add links from many of the project pages to pre-existing content, such as file libraries. One of the authors traveled from Ottawa to Vienna during this process and was able to access the wiki from both locations, uploading new material as it was prepared.

### ***6.3 Canadian government department wiki***

A specialist group of five individuals within a Canadian government department (which prefers to remain nameless) used a wiki for just over a year to share knowledge within their group. Initially they had no librarian or editor and the content on the wiki eventually grew unmanageable. Authors had difficulty deciding where to put new articles or whether the article already existed. After approximately 6 months, a part-time editor was brought on. This person was able to reorganize the material and inject new vitality into the wiki. Unfortunately, after about a year, a departmental reorganization broke up the group and relocated all of the original members to other sections within the department. Because the group was not reconstituted, the wiki fell into disuse. Surprisingly, the wiki was able to survive despite various technical difficulties, including logon and authentication problems, that were not caused by the wiki software. But this example does point out that a successful wiki needs enthusiastic authors and a librarian.

### ***6.4 Other knowledge-sharing examples at the IAEA***

The IAEA is deploying Livelink Enterprise Content Management (ECM) software as a solution for knowledge management within the Agency as a whole. Livelink ECM (quoting its publisher) “secures and controls all content, integrates with enterprise applications, and connects all users to all information.” Several groups within the IAEA have collections of highly specialized knowledge that they need to share amongst the group and they are looking at wikis as a possible technology for sharing this knowledge.

The Installed Systems Section of SGTS needs a technical data base to track equipment-related details for each facility, such as configuration changes, firmware upgrades, links to review software, outlines of maintenance requirements, as well as links to related documents such as duty trip reports. Using a wiki for this task has several advantages: there is no need for preconfigured data-entry masks, wiki pages are flexible enough to follow complex system configuration changes, and users need little training.

### ***6.5 The anonymous examples***

While interviewing individuals about their organizational experience with wikis, a curious paradox emerged: many users were quite enthusiastic about using wikis, but they felt it would be inappropriate to identify their employer in this paper. Whether this is due to

legitimate security concerns (the usual reason) or some other cause is debatable. However, an interesting experiment can be performed using the Google search engine: as key words, enter “wiki” and the name of your favorite large corporation.

## 7 Concluding Remarks

Wikis offer considerable advantages to groups engaged in collaborative document preparation and knowledge sharing. They can be implemented cheaply and they require little user training. They provide immediate benefits and immediate feedback – combining many of the positive attributes of mainstream knowledge-sharing technology such as email, web sites, and message boards.

Through the history feature, wikis preserve the conversation around a topic while presenting a final consensual version. By following the “secrets of success with wikis” outlined in this paper, you and your colleagues can begin enjoying the benefits provided by wikis. Just remember: if you see something on your wiki that can be improved – just change it. That’s the WikiWikiWay!

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