An Evaluation of Open Source Conversational Technologies for Enterprise Use: Wikis and Weblogs

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Purpose

The purpose of this research is to understand and evaluate the use of open-source social software as a means for improving enterprise efficiency, organizational knowledge and group collaboration. Chawner and Lewis (2006) define social software as any software that "makes it easy for groups of people to communicate or work together in a virtual environment." Examples of social software would include wikis, weblogs (blogs), online discussion forums, Internet Relay Chat (IRC), instant messaging (IM), group decision support systems (GDSS), email, and video and voice conferencing. Though all of these conversational technologies potentially provide their own significant benefits in terms of improvements to organizational efficiency and knowledge, this paper will focus primarily on wikis and weblogs.

The research is presented in three sections. The first section addresses wikis, how they work, their features and suggested benefits from organizational use; including their use as a tool for knowledge management. This section also includes a discussion of wiki shortcomings, practical organizational applications, and suggestions on how to select and successfully implement wikis. The second section takes a similar approach in exploring weblogs and the last section compares the two technologies and provides a brief discussion.

The Wiki

Wikis on the Horizon

The use of wiki technology in an organizational setting is a relatively recent phenomenon. In 2004, the popular media began running articles touting wikis as an "up and coming" technology for supporting collaboration within and among firms with articles appearing in the Wall Street Journal and Business Week. In more academically oriented research Engstrom and Jewett (2005) and Goodwin-Jones (2005) claim that wikis are, "collaborative environments by design" and are naturally suited for a variety of purposes for collaborative online projects including collaborative content creation and editing (Goodwin-Jones, 2003; Tonkin, 2005). Among other implementations (discussed later) wikis have also been successfully used as shared repositories for knowledge (Goodwin-Jones, 2003) where enterprise data, information, and insight can be stored and expanded upon (Swisher, 2004).

The future for wikis in the workplace seems bright. Whether or not a wiki can be sustainable is currently not an issue of debate. The largest and most popular wiki, Wikipedia (an online encyclopedia), which begun in 2001, still experiences expediential growth with more than 880,000 reported articles in English at the end of 2005 (Chawner and Lewis, 2006).

However the reality is that most managers are not equipped with the knowledge necessary to select a wiki, complete the server installation, and train their employees to manage the wiki appropriately in order to reap the purported the rewards. As wikis leave the obscurity and insecurity of open source development and evolve into stable marketable tools more organizations will realize their benefits. To assist this transition

Swisher (2004) reports that over the last few years venture capitalists have funded several startups interested in taking the wiki to a “larger general-business audience”.

The History of WikiWikiWeb

The term ‘wiki’ comes from the Hawaiian word for ‘quick’ or ‘fast’ (Raman, M., Ryan, T., and Olfman, L, 2005; Chawner, B. and Lewis, P., 2006). Therefore, a WikiWikiWeb is a ‘quick website’ referring to the speed with which content can be created.

The first wiki was invented and developed by Howard G. (Ward) Cunningham between 1994 and 1995 for the Portland Pattern Repository and was written using Practical Extraction and Report Language (PERL) (Chawner, B. and Lewis, P., 2006; Lamb, 2004). The intention of TheOriginalWiki or Ward’sWiki as it is sometimes called was to communicate specifications for a software design project (Wagner, C., 2004). The technology was designed to enable developers to regularly update the wiki pages in a collaborative manner, continuously changing and updating the information on the wiki (Raman, M., Ryan, T., and Olfman, L, 2005). According to Tonkin (2005), Cunningham described his invention as “'the simplest online database that could possibly work”.

Cunningham’s wiki provided one realizable option for Berners-Lee's (one of the forefathers of the web) early vision of the Internet by enabling authorized users to edit and create new content using only a web browser (Chawner, B. and Lewis, P., 2006). Cunningham’s wiki can still be found at http://c2.com/cgibin/wiki.

What is a Wiki:
A Technological Overview

Leuf and Cunningham (2001) define a wiki as "a freely expandable collection of interlinked Web pages, a hypertext system for storing and modifying information…a database where each page is easily editable by any user with a forms-capable Web browser client" (p.l4). In short, a wiki can be described as “an open author system for a conjoined construction and maintenance of websites” (Fuchs-Kittowski and Andre Kohler, 2002).

A wiki requires web access to realize its benefit, therefore a wiki must to be installed on a web server (i.e. a wiki is a server-based tool). The underlying software used to operate a Wiki is known as a WikiEngine, and is available in a wide variety of languages and an ever growing set of features. According to Raman, Ryan and Olfman (2005), “the technology is governed by an underlying HTTP protocol that determines client and server communication. Wikis are able to respond to both requests for data (GET) and data submission (POST), in a given Web front, based on the HTTP protocol.”

The wiki hypertext system, consisting of minimal HTML elements, uses simplified hypertext markup to format page text and graphic content. Once users learn a few formatting tags, the wiki allows any (authorized) user to edit existing web page content or create new web pages using any web browser and a text entry form. The editing of these

pages does not require any additional functions in the web browser (Chawner, B. and Lewis, P., 2006; Lamb, B. 2004; Raman, M., Ryan, T., and Olfman, L. 2005).

The concept of an ‘authorized’ wiki user centers on the read and edit permissions granted to a user by the administrator of the system. Most wikis are open to the general public without the need to be ‘authorized’, however when session log-in is required a "wiki-signature" cookie is used for authentication (Engstrom, M. and Jewett, D., 2005). Wiki systems vary with respect to the control that is exercised over these permissions, but will generally fall into six categories identified by Leuf and Cunningham (2001). These are summarized in the table below:

Permission Type	Description
Fully Open	Anyone has full unrestricted read and edit privileges to any page on the wiki
Lockable	Restricts editing for some or all of the pages. Read rights are unrestricted
Gated	A mix of public and private pages, where some pages may be locked to authorized users (only authorized users may edit or read these pages)
Members Only	Access is restricted only to authorized / registered users
Firewalled	Access is restricted only to a specific range of IP addresses
Personal	Access only from a specific PC or private site

Table 1: Types of Wiki Permission Settings
(Based on Leuf, B. and Cunningham, W., 2001)

A Functional Overview

When Cunningham programmed the first wiki he based his design on eleven design principles. It is from these design principles that wikis derive their functionality. This section will explore the most notable functional attributes of a wiki. A summary of all of Cunningham’s design principles may be found in the Appendix, Table 2.

One of a wiki’s most unique features is the ease with which a page can be created and updated or, in other words, its support of 'simple user-editable data storage’ (Tonkin, 2005). A user may make changes to a page and, for the most part, there is no review process before the modifications are accepted and published. Wiki’s also allow for these edits to be made in real time and appear instantly after the page is saved (Wikipedia, 2006).

Since the system is ‘open’ to its members, any authorized member of a wiki community can edit any pages on that community's site. With ‘open editing’, pages tend to (and are encouraged to) have multiple contributors. According to Lamb (2004), this phenomenon removes the notions of page "authorship" and "ownership". Fuchs-Kittowski and

Kohler (2002) describe this as the removal of, “boundaries between the (active) author and the (passive) user”. The content that is jointly created therefore becomes, in Lamb’s (2004) opinion, “ego-less, timeless and never finished”.

One final important functional characteristic of a wiki is its interconnectivity. The term wiki actually refers to an entire body of wiki pages, which are usually highly interconnected (Engstrom, M. and Jewett, D., 2005; Wikipedia, 2006). Using hyperlinks users are encouraged to participate in the ‘promiscuous interlinking among wiki pages’ (Lamb, B. 2004; Wagner, C. 2004). Through this process users build and develop what Raman, Ryan, and Olfman (2005) call "meaningful topic associations”. Over time these links incrementally develop the structure of the site (Wagner, C. 2004). In Lamb’s (2004) description, “the structure of wikis is shaped from within not imposed from above. Users do not have to adapt their practice to the dictates of a system but can allow their practice to define the structure.” Over time, this naturally developing structure creates knowledge bases and a breeding ground for a learning community. Additional features and benefits of wikis will be discussed in the sections below.

How to Work a Wiki

Creating and editing a wiki page is quite simple. As mentioned earlier, the author uses a web-enabled form field to enter the text they wish to publish. This may be done using a combination of plain text, simplified wiki mark-up language, or less commonly HTML (Wagner, C. 2004; Tonkin, E. 2005). An example of wiki simplified mark-up language appears in Table 3 below:

Command	Result
Blank Line	New Paragraph
Left Margin Asterisks (*)	Bulleted List
Left Margin Number Signs (#)	Numbered List
Apostrophes (")	Indicate Emphasis (Italics or Bold)
Four or More Hyphens (----)	Horizontal Line
Exclamation Points (!) (!!) (!!!)	Varies the Size of the Text
Square Brackets ([ ]) or CamelCase	‘Free Linking’

Table 3: Examples of Simplified Wiki Mark-up Language Text Formatting Commands

(Adapted from Chawner and Lewis, 2006)

Users may also create new pages and links to other wiki pages using a method called "free linking" (Chawner and Lewis, 2006). A ‘free link’ is created when editing a wiki page by enclosing any word or phrase within square brackets. A user may also ‘free link’ using a convention called CamelCase which involves mashing capitalized words and phases together eliminating spaces between them (Lamb, 2004). When the user saves the free linked page the wiki interprets the markup and presents the hyperlink. If the free link is to an existing page the wiki software will automatically make the association. The wiki also automatically creates reverse links or back links from destination pages to all pages that refer to them. According to Chawner and Lewis (2006), “this convention

enables bi-directional Wiki navigation without the [use of the] browser's BACK button [enabling users to] explore the entire wiki web, independent of their entry point".

If the free link is a new page, the hyperlink will appear with a question mark (?) next to it. Once the user clicks on the question mark, a new page is created and an empty entry form field is presented. Free linking can also be used to link to local file attachments, e-mail links, external web sites, and other networked resources (Chawner and Lewis, 2006). The interlinking of hyperlinks connects topics and creates context.

The process for uploading files is built into most wiki programs. File uploads do not require a separate FTP program and may be accomplished by using a web browser and an HTML form. Administrators can set upload parameters specifying allowed file types and file sizes. They may also limit who is approved to upload by giving this permission to authorized users only.

Features of a Wiki

Thus far, only core wiki features have been discussed, i.e. ease of editing, simple mark-up, and automatic hyper linking. This section will explore wiki features in more detail, outlining a number of evolved features that make wikis appealing for organizational use. It is important to note that most of these features are barely noticeable on a published wiki page, but according to Wagner (2004), "significantly improve the knowledge creation and sharing process".

The first important feature of a wiki is its ability to manage versioning and page history. Since any authorized user may edit page content at any time as a precautionary measure,wikis keep prior versions of all web pages in memory (Wagner, C. 2004). This edit trail referred to as a version control system and it results in the creation of a complete log of every change made to every wiki page (Engstrom and Jewett, 2005). The wiki is then able to provide a history of prior changes with author, date, and comment(s) explaining the change. The version control system allows the wiki community to see what has been changed, enables rollback, comparison (current version of a page with earlier versions), difference identification, and similarity comparison. Some advanced wiki engines even support e-mail notification or Really Simple Syndication (RSS) feeds for page additions, changes, and deletions (Wagner, C. 2004; Chawner, B. and Lewis, P. 2006).

Another feature of wikis is their ability to bring attention to orphaned pages and open links. As users continue to add free links and pages to the wiki, tracking and connecting these pages can become a tedious task. Most modern wiki software allows administrators to open a directory that displays all open links and orphaned pages, permitting administrators to assign place and meaning to these pages (Wagner, C., 2004). Not only does this provide context to the text but it also acts as a website maintenance tool.

More advanced wiki engines also come with a number of orientation tools for the user such as search and bread crumbing. For example, PmWiki engine (among others) offers 'WikiTrails' as a feature for organizing sets of pages. The WikiTrail, which appears at

the top and bottom of each page, allows access to the previous page, home, and next pages in the sequence. Much like a bread crumbing system, WikiTrail links facilitate logical movement through the pages (Chawner and Lewis, 2006). A basic keyword search engine is standard in most wiki engines, though some more advanced wikis offer additional search capabilities including Boolean command and editable search criteria.

All wiki engines are equipped with a 'sandbox' for new users. A sandbox is a set of pages dedicated to new users to practice publishing content and using the wiki mark-up language. The sandbox looks and feels exactly like the rest of the wiki to the user, but the pages created tend to have a short lifespan (usually periodically deleted by the system or administrator) since the sandbox is nothing more than a practice ground for new users.

Most wikis also incorporate what Wagner (2004) calls, 'multi-user control features'. These may include provisions for multiple user access and safeguards to avoid conflict or discrepancies occurring from multi-user edits. The level to which the administrator can control these safeguards usually depends on the wiki engine, but most provide some minimum level of control.

The features in this section only begin to discuss the expanded features available in wiki engines today. Today's more advanced wikis look and feel more like content management systems than basic text edit tools. Despite this, the fundamental nature of a wiki remains the same. Most wikis still encompass Ward Cunningham's elements of wiki essence (presented in Table 4) in their features.

Fast retrieval and change of webpage
Simple markups for formatting instead of HTML
No markups for links (pages, external links, images)
content is basically ego-less and time-less (it's not considered important who wrote it and when it was written)
Hyperlinks appear when referred to (no need to create them)
Encourages creation of hyperlinks, and always shows which ones are valid
RecentChanges
Loss of history (some wikis add a page history)
Flat name space (some wikis allow subpages or hierarchies)
Anyone in the world can change anything

Table 4: Elements of Wiki Essence
(Cunningham, H.G. 2006)

Organizational Benefits of a Wiki

The literature examining the organizational benefits of a wiki has only recently begun to emerge. As enterprises utilize wikis throughout their functional units more benefits and uses emerge as well as new costs and risks. In a 2005 survey of 168 corporate wiki users conducted by Majchrzak, A., Wagner, C. and Yates, D. (2006) users identified three main types of benefits from corporate wikis: "enhanced reputation, work made easier, and helping the organization to improve its processes". It is important to note that for the most part, the surveyed respondents were experienced wiki users - they had average of 15

months contributing to a company wiki, and an average of 26 months contributing to wikis in general. However, there were a number of respondents who had spent only an average of one month contributing to a wiki. The results of the survey are summarized in Table 5 below:

	% "often" to "significant" (5-7 on 1-7 scale)	Mean / (Std. Deviation)
Enhanced Reputation "To what extent has using this wiki helped you to":		
-- earn respect of others	29	3.66 (1.48)
-- improve professional status	23	3.25 (1.56)
-- improve reputation in company	28	3.53 (1.50)
Made Work Easier "How often have you added new information or made a change to the wiki because":		
-- information was of immediate relevance to my work	81	5.40 (1.36)
-- by keeping knowledge updated, my work would be easier	75	5.23 (1.35)
-- by putting in my knowledge, disseminating my work would be easier	71	5.03 (1.56)
Helped Organization "To what extent would you say that your knowledge-sharing on this wiki has helped your organization to":		
-- improve work processes	49	4.46 (1.35)
-- increase collaboration efficiency	63	4.78 (1.34)
-- increase knowledge reuse	69	5.07 (1.34)
-- identify new business opportunities	11	2.45 (1.36)

Table 5: Corporate Wiki User Survey Results

It is evident from the table above that wikis can help an enterprise by improving work processes, increasing collaboration efficiency and knowledge reuse. There were also a high percentage of respondents who feel that the corporate wiki made their work easier. However,it did not seem clear from the findings that wikis helped identify new business opportunities or significantly enhanced reputations. The authors concluded that the benefits realized from wikis are primarily organizational and work-related. Further, these benefits are more likely to be seen when, "the wiki was used for tasks requiring

novel solutions and the information posted was from credible sources." (Majchrzak, A., Wagner, C. and Yates, D., 2006)

Knowledge Management and Wikis

One significantly cited benefit of a wiki is its use as a conversational technology for managing knowledge. Wagner (2004) suggests that nine such conversational technologies exist in organizations; "e-mail, static and database backed web pages, discussion forums, internet chat, video-audio streaming, video-audio conference, GDSS, web log and wikis" (Wagner 2004 pp. 269). Other researchers (Leuf and Cunningham, 2001; Wagner, 2004; Lamb, 2004; Fuchs-Kittowski and Kohler, 2002, 2005; Raman, Ryan, and Olfman, 2005) have also made arguments for the use of wikis as knowledge management systems for supporting knowledge creation and sharing. It is important to note that wiki technology can monitor knowledge input in terms of quantity (tracking pages updated or created), but determining the quality of knowledge contributed is somewhat subjective (Wagner, 2004). This section will explore these arguments in greater detail and evaluate the wiki as a knowledge management tool.

Knowledge Creation with a Wiki

In an organization knowledge is often developed communally, over time, and occurs as a result of interactions among the individuals of the firm. According to the knowledge-based theory of the firm knowledge is the key resource of the firm. It starts at the individual level and it is then the job of the organization to integrate this knowledge using a combination of predominantly social mechanisms and technology (Nonaka, 1994; Nonaka & Takeuchi, 1995). According to this approach an organization cannot create knowledge by itself; instead, it is through the sharing, reinterpretation and combination of individual knowledge that leads to the creation of organizational knowledge. In order to facilitate this knowledge sharing, rei8nterpretation and combination the organization must provide an integrated set of solutions or a platform for conversational knowledge creation.

In their research, Leuf and Cunningham (2001) found that, "wikis can support continuous discussion during the process of creating and sharing knowledge". Wagner (2004) had similar findings concluding that wikis are ideal for supporting "conversational knowledge creation and sharing". According to Wagner (2004) through conversational knowledge creation, "individuals create and share knowledge through dialog with questions and answers" (usually via computer support). The knowledge repositories created are beneficial to the organization because they remain as collective bases of contextual knowledge. Wagner (2004) also found this method of creating knowledge beneficial because it is economical and technologically undemanding. It is also fast, useful for environments where ad-hoc knowledge creation is required, and is suitable for environments where the knowledge is not centralized, and resides in the heads of dispersed individuals (Wagner, C., 2004). According to Wagner,

> "[O]rganizations willing to embrace the "Wiki way" with collaborative, conversational knowledge management systems, may enjoy better than linear knowledge growth while being able to satisfy ad-hoc, distributed knowledge needs." (Wagner, 2004, p. 265)

Frank Fuchs-Kittowski and Andre Kohler (2002; 2005) conducted their assessment of wikis as a knowledge (creating) tool by developing and comparing design requirements needed for such as system to the characteristics of a wiki. The authors felt that the technology must offer community support tools and, "insure the continuous cooperative development of the structured knowledge provided." (Fuchs-Kittowski and Kohler, 2005) In order for this to occur, in the authors' opinion, the tool must meet the following requirements:

1. The provision of context-related (process-oriented) access to the knowledge network (repository) and community knowledge
2. Co-operative generation and preservation of knowledge in the community without a constriction of the social, self-organized knowledge regeneration process of the community by given process-structures
3. The possibility to (loosely) associate knowledge components.

(Fuchs-Kittowski and Kohler, 2002, 2005)

Fuchs-Kittowski and Kohler (2002, 2005) conclude that the characteristics of a wiki 'widely comply' with the afore-mentioned design requirements. Further, the cooperative construction of content on a wiki is achieved, in their opinion, more efficiently because the distinction between the author and reader is removed (discussed in more detail below). Overall the authors conclude that, "the wiki approach appears to be a suitable solution for IT support of cooperative community knowledge generation" (Fuchs-Kittowski and Kohler, 2005)

In his work, Wagner (2004) took a similar approach to that of Fuchs-Kittowski and Kohler for accessing knowledge management needs and corresponding wiki characteristics. Wagner began his evaluation by distinguishing the needs of a knowledge user from those of a knowledge creator. Once he identified these needs, Wagner developed corresponding system design requirements. A summary of these findings can be found in Tables 6 and 7.

Knowledge Management Need	Description	Design Requirement
Ad-hoc knowledge	Knowledge users are likely unable to specify their knowledge needs a priori.	a tool that incorporates fast question answering
Finding the knowledge	Locating knowledge is a major challenge in any knowledge management system.	users will benefit from a tool which is "search (engine) friendly", and thus keyword oriented, hyperlinked, and indexed
Filtering knowledge from noise	Filtering is the complement to the previous need. Users want to find knowledge, but only if it is relevant	to convey context a tool with advanced search engine and hyperlinking capabilities is beneficial
Quality of the source	Quality assurance is a user concern, specifically the quality of the knowledge source	knowledge management tool is needed to incorporate quality assurance mechanisms, including the tracking of knowledge sources

Table 6: Knowledge User Perspective: Knowledge Management Needs and Design Requirements (Wagner, 2004)

Knowledge Management Need	Description	Design Requirement
Dynamically changing knowledge	Maintaining knowledge is exceedingly difficult when that knowledge changes rapidly.	the technology needs to support distribution of knowledge creation activities to as many participants as possible.
Distributed knowledge	In most cases, collective knowledge is superior to the knowledge of any individual	knowledge management tool should be able to combine the knowledge of multiple experts seamlessly
Errors and recovery (quality assurance)	Inevitably, the knowledge base will be incorrect at some points in time.	Management tool therefore benefits from self-correcting mechanisms that quickly correct any errors in the knowledge base
Publication overhead	Knowledge creators should not need to worry primarily only about the knowledge content	Message representation and posting on a shared knowledgerepository should be fast, easy, and secure

Table 7: Knowledge Creator Perspective
Knowledge Management Needs and Design Requirements (Wagner, 2004)

Wagner (2004) continues his argument by elaborating on seven wiki characteristics which satisfy his identified system design requirements as well as the needs of the knowledge user and creator. A summary of these wiki characteristics may be found in Table 8. Corresponding knowledge needs and wiki characteristics are displayed in Table 9.

Wiki Characteristic	Description
Incremental knowledge creation as question answering	Individuals are able, and even encouraged, to begin creating knowledge content that is incomplete (or even erroneous) and then to rely on other collaborators to add content. Users generally do not need to search through archives or page histories to find the best content.
Powers of N	Wikis create joint ownership of the work product. Each person can add to each other's pages and can make changes. The "Power of N" also plays an important role as a safety and reliability feature. For any individual who attempts to maliciously alter or remove Wiki content, there are many others who quickly repair the damage.
Centralized, web based resource	Wikis support a decentralized group of conversationalists, but the technology infrastructure is designed to be centralized. Wikis use a common repository; Wikis are thus available anytime and anyplace
Content-to-page mapping (Granularity)	The basic unit of information in a Wiki is a web page. In a Wiki, if there is a mismatch between knowledge concepts and Wiki pages, it can be adjusted, either by breaking the content into multiple pages, or by combining multiple pages into one. If multiple pages cover the same topic, art of the editing guidelines would suggest combining their contents. Thus wikis can achieve a one-to-one mapping between knowledge concepts and their representation within the Wiki.
Indexed content	Since each concept is specific to one web page, its URI is unique, and therefore can be indexed and searched. , knowledge concepts can be catalogued individually and found easily even by search engines incapable of full text search

Hyperlinks to create context	Hyperlinks connect concepts to other concepts, thereby creating context. Aside from the obvious advantage of allowing readers to make connections and to drill down into detail knowledge, hyperlinks are also a potential quality assurance mechanism and relevance indicator. Pages with many links to them indicate a highly useful page.
Work product orientation	In a Wiki, the work product, the knowledge content in its iteratively improved form, is the focus of attention.

Table 8: Summary and Description of Wagner's Wiki Characteristics (Wagner, 2004, p 276-278)

User Needs	Wiki Characteristics and Features
Ad-hoc knowledge	Incremental knowledge creation as question answering; Power of N; Wiki editing features (speed of publication)
Finding knowledge	Knowledge indexing and hyperlinking; Backlinking; Centralized, web-based resource
Filtering knowledge from noise	Hyperlinking; Power of N; Removal of duplication
Quality of source	Power of N; Record of history of changes with author information; Ability to comment on changes
Dynamically changing knowledge	Power of N; Wiki editing features (history and version management)
Distributed knowledge	Power of N
Errors and recovery	Power of N; Wiki editing features (history and version management)
Publication overhead	Wiki editing features; Wiki publication features

Table 9: Corresponding User Needs and Wiki Characteristics (Wagner, 2004, p. 278)

The research above alludes to a number of interesting findings. First wikis tend to create a paradigm shift with the way knowledge is created and owned (Wagner, 2004). When knowledge is created there is no single owner or creator of the knowledge. Instead the knowledge base is created, maintained, and owned by a community. Wagner (2004) refers to this as the Power of N, which not only leads to more efficient and accurate knowledge; it also minimizes the chance for malice and error.

The ease and speed of publishing content combined with the ability to engage a large group of people in the knowledge creation process makes wikis an ideal platform for knowledge repositories (Wagner, 2004).

Wiki Shortcomings

In deciding to implement a new collaborative or knowledge management technology, organizations must weigh the benefits of the proposed system to any potential shortcomings. This section will explore the identified flaws and shortcomings of wiki technology.

The primary potential vulnerability of a wiki involves its ability to keep the content secure and accurate (Ybanez-Delid, 2006). Most wikis function under a "Soft Security" principle, which means that the community (not the technology) enforces order (Lamb, 2004). Since anyone in the community can edit and change text, it leaves the wiki open to malicious attacks and Wiki Spam. Chawner and Lewis (2006), suggest increasing the level of security by requiring a password as well as hiding the wiki from search engines by using 'nofollow' or 'no index' meta tags. Lamb (2004) feels that this problem naturally fixes itself because wikis save copies of previous pages. Therefore, as long as someone is monitoring the work that has been deleted or defaced can always be recovered. Lamb (2004), also feels that since there is a 'strong sense for common purpose' among the wiki community the 'proportion of fixers to breakers tends to be high'.

A second series of concerns with wikis are technical in nature. Since wikis are primarily developed by open source communities there is likely to be some question as to their architectural stability (Lamb, 2004; Wagner, 2004). Open source wikis tend to have frequent updates, bug patches, and new version releases which are all capable of jeopardizing platform stability and content integrity. Organizations interested in employing an open source system wiki should first carefully evaluate its stability and perform timely content achieving.

Other technical concerns relate to the ability to restrict multiple dispersed users from editing the same wiki page at the same time (Wagner, 2004; Wikipedia, 2006). Further, the lack of a standard for wiki content markup language (different wikis store content in distinct ways) also makes it difficult to migrate content from one wiki engine to another (Chawner and Lewis, 2006; Lamb, 2004). Unfortunately, at this time, there are no easy solutions to either of these concerns.

Moving away from technical and security issues, wikis also raise a number user interface concerns. Users accustomed to word processors or web publication tools such as Dream Weaver or Front Page will have a demanding time adjusting to the relatively novel and limited options of the wiki text editor (Wagner, 2004). Most wiki engines lack the 'what you see is what you get' (WYSIWYG) editing environment users are accustomed to though some more complex wiki engines do include this feature. Another user interface concern is the 'absence of an explicit organizing structure', making it difficult for users to orient themselves in the environment (Lamb, 2004). Some wikis have tools to assist in

creating structure (bread crumbing system) but generally this is the job of the community or moderator/administrator.

Another issue that has no simple solution involves the intellectual property rights to the content, especially when contributors are anonymous, or the origins of texts are unknown (Lamb, 2004). Currently three intellectual property schemes are used by wiki communities:

1. Community Copyright: allows individuals to assert rights over their work while allowing their contributions to be modified within the wiki
2. Public Domain: any contributor to the wiki space surrenders all copyright
3. Copy Left: anyone to use the content of the wiki for any purpose and to make derivative works, under the condition that all copies and derivative works are released under the same license as the original. (Lamb, 2004, p. 46)

Wikis have also been criticized as being too plain, or not having enough flexibility when it comes to fonts, colors, and layouts (Lamb, 2004). Though this is true of most wikis, it is possible to change the look and feel of a wiki by altering its cascading style sheet. Though this may improve the aesthetics, changing the questionably stable open source code may further jeopardize the stability of the engine. For organizations, this should be of minimal concern since the quality in a wiki is in the content, not in its aesthetics.

One last concern worth mentioning is the cultural change needed to assure the success of the technology. As Wagner (2004) stated, “the technology alone cannot be expected to change organization culture, without the organization's readiness and decision to use”. It is quite difficult to change organizational behavior and those used to instant messaging and email may be difficult to convert, especially since instant messaging allows for instant response (Wikipedia, 2006). Converting users over involves teaching network literacy as well as the ability to write in a distributed collaborative environment. Creating this nurturing culture will be discussed in more detail in the Keys to Successful Implementation section below.

Practical and Existing Wiki Applications

Previous sections of this paper have summarized the benefits of a wiki and argued for its use as a knowledge management tool. This section will summarize other practical organizational uses of a wiki and examine how large Fortune 500 companies use wikis.

According to Chawner and Lewis (2006), wikis can be used in two modes: collaboration and discussion mode. In collaboration mode, the focus is on creating a mutually satisfactory item of collaborated text. Discussion mode, on the other hand, creates a dialog in which individual contributions are kept separate; creating a tread (Chawner and Lewis, 2006). Another distinguishing factor of how wikis are used involves the number of users contributing. According to Tonkin (2005), wikis may be used as a single user knowledge base or as a collaborative tool for multiple users. In the summary of practical wiki uses below (Table 10) both the collaboration/discussion mode and single/multi user distinction is recognized.

Practical Wiki Use	Description, Collaboration vs. Discussion Mode, and Single vs. Multi User	Authors Referenced
Collaborative Writing	Two or more people jointly creating a document. Ideal for individuals who are geographically dispersed. Collaboration Mode Multi User	Tonkin, 2005; Chawner and Lewis, 2006; Godwin-Jones, 2003; Engstrom and Jewett, 2005; Wagner, 2004; Lamb, 2004; Fuchs-Kittowski and Kohler, 2002, 2005
Brainstorming / Mapping Concepts	Shared online sketchpads or space for business brainstorming; map concepts; hashing out ideas; research notebook. Collaboration or Discussion Mode Single and Multi User (single user brainstorming ideas or conjoined production of concepts)	Lamb, 2004; Tonkin, 2005; Fuchs-Kittowski and Kohler, 2002, 2005; Majchrzak, Wagner, and Yates, 2006
Project Management	Project development Including: creation of deliverables, meeting agendas, status reports, great ideas, standards and practices, work product drafts and outlines. Milestones and various kinds of to do list. Tracking worker activities (who is doing what) Collaboration Mode Multi User	Fuchs-Kittowski and Kohler, 2002, 2005; Majchrzak, Wagner, and Yates, 2006; Godwin-Jones, 2003; Engstom and Jewett, 2005; Chawner and Lewis, 2006
Software development	Technical documentation, client approval, issues tracking, internal workflow, quality & process management, software design, reference information, setup information, configurations, specifications, instructions for installing software, listing of software versions used in the company, application maintenance and operations Collaboration Mode Multi User	Majchrzak, Wagner, and Yates, 2006; Chawner and Lewis, 2006

Meeting Planning	Provisional agenda is drawn up, URL is distributed to the participants, who are then free to comment or add items. During the meeting, the online agenda serves as a note-taking template. After the meeting details are instantly available online, allowing the participants or anybody else to review and annotate the proceedings. Collaboration Mode Multi User	Lamb, 2006; Engstom and Jewett, 2005
Content management system	Maintain an easily updatable web site. Add content or update existing content, archive collections of document images and multimedia files Collaboration Mode Multi user but can be single user since wikis may be used as personal information managers PIMs	Fuchs-Kittowski and Kohler, 2002, 2005; Chawner and Lewis, 2006; Engstom and Jewett, 2005
Discussion boards or collaborative communication forums	Exchange opinions; ask and answer technical, functional and operational questions; voice concerns. Includes a 'Help Facility' Discussion Mode Multi user	Fuchs-Kittowski and Kohler, 2002, 2005; Engstom and Jewett, 2005; Wagner, 2004
Knowledge base or knowledge management system	Using a wiki…"knowledge can be modified and extended instantly giving rise to an integrated. interdisciplinary and co-operative knowledge base" (Fuchs-Kittowski and Kohler, 2002). A wiki can be used as a knowledge management tool by creating: Concept maps: (a visual technique for representing knowledge and information executed by creating perpetually updated lists or a collection of integrated links) Expertise 'best practice' Repositories: (how-tos, innovative methods and processes utilized, corporate polices and procedures, personal blogs, corporate information, complement pages to formal intranet pages)	Fuchs-Kittowski and Kohler, 2002, 2005; Tonkin, 2005; Majchrzak, Wagner, and Yates, 2006; Wiki, 2006

Knowledge base or knowledge management system	Technical knowledge bases: (Tech support: including best practices, technical memos, customer support information-sharing, local help information with how-tos and best known methods, systems requests for new hardware, email setup, software downloads) R&D: (product requirements, product information, & commercialization) Collaboration and Discussion Mode Single and Multi User	
Group Decision Support System (GDSS)	Wagner (2004) argues that a wiki can be an effective GDSS because it, "incorporates a many-to-many knowledge creation and sharing model, instead of the one-to-many model propagated…in weblogs, e-mail or websites." Additionally, he feels a wiki is superior because it organizes the knowledge topically instead of chronologically like weblogs, discussion forums, or e-mail. Lamb (2004) adds that the, "wide-open ethic of wikis contrasts vividly with the traditional approaches of standard groupware and a collaborative systems [with their] access restrictions, rigidly defined workflows, and structures" Unlike traditional GDSS systems, wikis allow the users to define how their processes and groups will develop. Collaboration Mode Multi User	Wagner, 2004; Lamb, 2004
Online Communities / Communities of Practice (COP)	According to Goodwin-Jones (2003), "A COP is a way of achieving collective applied learning with the expectation that over time expertise in a given subject area is developed and solutions to common issues and shared problems are found, posted and discussed…its goal is to expand knowledge and improve practice in a specific area."	Fuchs-Kittowski and Kohler, 2002, 2005; Majchrzak, Wagner, and Yates, 2006; Godwin-Jones, 2003; Wagner, 2004

Online Communities / Communities of Practice (COP)	Like Goodwin-Jones, other researchers (Fuchs-Kittowski and Kohler, 2002, 2005; Majchrzak, Wagner, and Yates, 2006; Wagner, 2004) have found wikis to be ideal platforms for communities of practice or knowledge networks communities. Fuchs-Kittowski and Kohler (2005), state that wikis are "eminently suited for the creation and evolution of knowledge in communities. Wikis contribute to participants consciously and actively benefiting from both the knowledge of others and the creation of group consciousness that are crucial in the community building process" Collaboration Mode Multi User	
E-Learning	Testing, requirement descriptions, training assignments, content for academic instruction, courses Collaboration Mode Multi User	Majchrzak, Wagner, and Yates, 2006; Engstom and Jewett, 2005; Wiki, 2006
Marketing and customer relationship management	Tracking marketing trends, collecting data, logging daily lead counts, information on partnerships, notifying users of' new features, marketing materials Collaboration and Discussion Mode Single and Multi User	Majchrzak, Wagner, and Yates, 2006
Resource management	Enabling users to reserve shared resources, human resource information, HR guidelines, insurance information, expense reimbursement, time-off/vacation schedules, restaurant and hotel recommendations Collaboration Mode Multi User	Majchrzak, Wagner, and Yates, 2006; Wiki, 2006

Table 10: Practical Wiki Uses

The various applications mentioned in Table 10 only represent a small number of the possible enterprise uses of a wiki. According to Wagner (2004), applications where wikis are less desirable are those, "with a stable and formalized set of knowledge that is not

changed much by experiences." Since most sets of organizational knowledge do not fit these criteria, the wikis use in an organization may be as open as the user's imagination. In most practical cases, the users decide for themselves how the wiki will fulfill their objectives and build it accordingly. This freedom combined with the fairly minimal technical support and training needed, makes the wiki an ideal collaborative tool for enterprise use.

According to Peter Thoeny, creator of the TWiki wiki engine, 35,000 people downloaded TWiki since 2001; two-thirds went to businesses which included Walt Disney, SAP, and Motorola (Hof, 2004). These companies only represent a few of the major Fortune 500 companies with wikis in use (a more inclusive list of organizations and their wiki applications is available in the Appendix, Table 11).

Enterprise wiki use is growing rapidly and the TWiki is only one of many open source wiki engines available. Outside of the open source arena, companies like Socialtext have emerged, effectively offering customers a complete purchasable 'enterprise wiki'. With so many options for software packages, the decision to select a wiki is not often an easy one. The next section will offer recommendations on selecting a wiki.

Selecting a Wiki

Most of the development of wiki software has been led by non-commercial, open-source efforts and the majority of existing wikis are available for free use as open source software (Swisher, 2004). According to Chawner and Lewis (2006) there are at least one hundred such open source wiki engines to choose from in an array of programming languages, with the most popular scripted in PHP, PERL, Python, and ASP. The different implementations all apply the basic wiki design principles discussed above, but differ largely in their additional features.

An organization's first concern in selecting a wiki engine is to make sure it is compliant with their web servers and operating systems. Most wikis operate on multiple platforms but there are some exceptions. Wikis programmed using Microsoft ASP, for example, will only run on Microsoft Windows Web servers.

Additionally, according to Chawner and Lewis (2006), it is also vital for organizations to select a wiki engine that has significant wiki documentation, project maturity, a supportive wiki community, W3C standards, Extensible Hypertext Markup Language (XHTML) compliance, and cascading style sheet (CSS) guidelines. Researchers (Chawner and Lewis, 2006) also feel that the organization must examine the features of the wiki carefully, selecting the ones that are most useful to their enterprise. Examples of such features may include: content management and groupware functions, voting, workflow management tools, file and image galleries, weblogging, advanced password controls, groups, Boolean or advanced search capabilities, interactive calendars, graphical editing buttons, RSS feeds, private discussion forums, interactive chat, file download archives, etc. (Wagner, 2004; Chawner and Lewis, 2006)

Some of the wiki engines are pre-designed with an ideal use in mind. For example TikiWiki is a large, PHP open-source content management system (CMS) (Chawner and Lewis, 2006). However, this wiki component is only one of many modules included. TikiWiki represents one of a few hybrid CMS/wikis available. These types of systems allow administrators to pick and choose their modules and easily deploy them using a browser-based control panel. PmWiki, on the other hand, is ideal for creating multiple group wikis according to organizational function, individual, topic, or any combination of these groupings. These groups may then have separate stylistic elements and password settings, making PmWiki perfect for establishing wiki farms and blending with existing web site layout designs (Chawner and Lewis, 2006). PmWiki also offers features like Boolean search capabilities, an interactive calendar, photo galleries, graphical editing buttons, and RSS feeds (Chawner and Lewis, 2006). Much like TikiWiki and PmWiki, Twiki offers an array of modules (234 in total) but is programmed in PERL CGI, giving the administrator a server option. Much like the others mentioned Twiki fits compliance guidelines, offers advanced search and email notification, and has an established community. The flexibility, updatability, and long standing supportive nature of their communities makes the larger module based wiki systems ideal for enterprise use. Tables 12 and 13 present Tonkin's (2005) comparison of wiki implementations and features, a more extensive interactive comparison may be also be made at http://www.wikimatrix.org/ (Wikimatrix.org, 2006).

	Language	Ease of Install	Version control	Access control	File attachments	Data storage
Tipiwiki	PHP	Easy	No	No	No	Flatfile
WikiAsp	ASP	Easy	No	No	No	MS Access
Kwiki	Perl/Cgi	Fair	Yes, as option	Yes, as option	Yes, as option	Filesystem
JSPWiki	JSP	Fairly easy	Yes, as option	No	Yes	Filesystem
Instiki	Ruby	Very easy	Yes	Basic	Yes, as option	Filesystem
Twiki	Perl/Cgi	Fair	Yes	Advanced	Yes	Filesystem
Perspective	.Net	Fair (XP SP2 issues)	Yes	Yes	Yes	Filesystem
MoinMoin	Python	Moderate	Yes	Yes (ACL)	Yes	Filesystem
TikiWiki	PHP	Hard	Yes	Advanced	Yes	Database

Table 12: Tonkin's (2005) Comparison of features of wiki implementations

	Syndication	Data export	Search	Locking	Suggested use
Tipiwiki	No	No	Yes	No	Simple applications
WikiAsp	RSS	XML	Yes	Collision protection	Small scale sites
Kwiki	RSS option	Not default	Yes, as option	Collision protection	Midscale sites
JSPWiki	RSS	No	Yes	Yes	Small-medium scale sites
Instiki	RSS	XML, TeX, PDF	Yes	Yes	Small-medium scale sites
Twiki	Extensive	Yes, as option	Yes	Yes	Intranet/internet site
Perspective	RSS	No	Yes	Yes	Intranet (good Office integration)
MoinMoin	RSS	No	Yes	Yes	Small-medium scale sites
TikiWiki	Yes	Yes, eg PDF	Yes	Yes	Intranet CMS

Table 13: Tonkin's (2005) Comparison of external features of wiki implementations

Keys to successful Implementation of a Wiki

The successful organizational implementation of a wiki system involves much more than simply the installation of the technology inevitable some change (sometimes significant) in the behavior of the users must take place. Currently, employees are accustomed to passing or broadcasting static documents using traditional methods like email. These methods not only hide the information, but also make it difficult or impossible to locate once the email has been deleted, archived, or saved to a local machine. With proper training and supervision, moderated wiki practices can function effectively within corporate environment (Lamb, 2004); especially when the administrator ensures that the

system chosen has the right set of features for the user requirements (Tonkin, 2005; Raman, Ryan, and Olfman, 2005). This section will examine suggestions, identified in the research, for successful implementation of a wiki.

The first goal of the administrating team is to ensure that the intended users understand and accept the purpose and benefits of the wiki. According to Chawner and Lewis (2006), getting people to contribute to a wiki is as much about culture as it is about technology. For there to be sustainable wiki use, the users must clearly understand its benefits. In their research Majchrzak, Wagner, and Yates (2006), found that most enterprise wikis show benefits in the areas of “improved organizational processes, collaboration, and knowledge reuse”. These may be important points to mention in introduction. The researchers also found that these benefits occur more frequently when the wiki was used for ‘tasks requiring novel solutions’ (rather than routine tasks) and when users require new solutions (with a corresponding need for collaboration).

Once users understand the purpose and benefits of the system, the next step of the administrating team is to train the users on the particular technology and its features. It may be best to begin by working on wiki mark-up before explaining additional modules and features. Most, if not all, wiki systems come equipped with a Sandbox for new users. The Sandbox allows new users to practice creating and linking pages without actually affecting the non Sandbox content. The Sandbox is an ideal place to have employees learn basic text formatting, saving, and linking. To assist in the learning process the administrator may provide a handout or link to a page with text formatting tips, since the mark-up may be unfamiliar to those accustomed to WYSIWIG editors and MS Word (Chawner and Lewis, 2006).

A training session should also explain how to use the versioning or Page History feature of a wiki; set suggested page naming conventions and writing style guidelines; as well as address copyright and content ownership (Chawner and Lewis, 2006). Users should also understand that a wiki is as much a tool for getting information as it is for providing it. Therefore, users should be encouraged to create what Chawner and Lewis (2006) call "wanted pages" to identify topics they would like to see another user write about.

In terms of organizing and maintaining the content, the administrating team might begin by setting up the initial structure so that users can see where their contribution might fit (Chawner and Lewis, 2006); though Tonkin (2005) points out that this must be a minimal imposition of structure since wikis tend to blossom when users define their own structure. Synthesizing the content after it is created is just as important as getting users to add it in the first place (Majchrzak, Wagner, and Yates, 2006). As Swisher (2004), points out, “an effective wiki must be pruned and weeded regularly to remain manageable.” Monitoring new and changed content may be the responsibility of the wiki community, but to assure that this task is done regularly and with consistency, the organization might benefit from assigning a wiki supervisor or moderator. It would be this person’s job to decide what content is inappropriate, free-link and cross link, monitor page history, establish categories, topics, and other prompts to direct participation, delete spam and vandalism, index, archive, and possibly train new users (Chawner and Lewis, 2006; Lamb, 2004).

Supervision is vital to the success of a wiki, especially in the initial adoption stage. It is important for the organization to remind users to use the wiki and to post working notes and documents to it. Nevertheless, it is also vital to remember as Lamb (2004) points out, "the medium works most effectively when [users] can assert meaningful autonomy over the process. It's not that authority can't be imposed on a wiki, but doing so undermines the effectiveness of the tool."

In order for the wiki to experience sustainable growth it must have a supportive community and culture. An underlying factor in the success of any organization wide technology initiative is an understanding the intended user. As Tonkin (2005) warns, "if you cannot imagine your target group conversing comfortably together under normal circumstances, the chances are fairly slim that they will imagine they can either … much less online." According to Goodwin-Jones (2003) wikis only work when users are serious about collaborating and willing to follow the group conventions and practices set out by the organization or community. Users must feel that the information posted on the wiki is not only useful to them in their work, but that it also comes from a credible source with credible knowledge (Majchrzak, Wagner, and Yates, 2006). In other words, the users must put faith in the knowledge of the community as well as adapt its practices. As Clay Shirky (as qtd in Lamb, 2004) observes, "A wiki in the hands of a healthy community works. A wiki in the hands of an indifferent community fails."

If the wiki community is nurturing the wiki technology can be sustainable in an organization. In their 2005 survey of 168 corporate wiki users, Majchrzak, Wagner, and Yates (2006) found that wikis had existed, on the average, from 12-24 months, had on the average of 12 contributors and 25 lurkers, and were "frequently" (5.8 on a 1-to7 scale) accessed. The authors also found that the older the wikis, the more frequent the accesses, the greater the number of' lurkers, and the greater the number of participants. This would suggest that once organizations get past the pilot stage, wikis become a sustainable part of their collaborative work processes.

The Weblog

Weblogs on the Horizon

Similar to wikis, weblogs have recently been praised as a useful new technology for enterprise use. Some of the most cited uses include knowledge management, collaboration and communication, project management, and individual and group evaluation. The rest of this research paper will explore weblogs in more detail, explaining the technology and its features; as well as exploring its practical uses and suggestions for successful tool selection and organizational implementation.

According to Jonathan Schwartz (2005), president and chief operating officer of Sun Microsystems, "In ten years, most of us will communicate directly with customers, employees, and the broader business community through blogs." In Schwartz's opinion, having and maintaining a weblog is not going to be a matter of choice. Schwartz is not alone in this sentiment; other researchers including Flatley (2005) and Kharif (2004) who also feel that weblogs will become must have tools for executives. According to Herring,

Scheidt, Bonus, and Wright, (2004), this integration into organizational use will occur because weblogs provide ordinary people a chance to self-express publicly on a medium that is free of the physical limitations of pages, intensions of editors, and delays involved in the publishing and distribution systems (Hourihan, 2002).

The History of Weblogs

The term "weblog" was coined by Jorn Barger in December 1997 (Juiceenewsdaily.com, 2005). The shorter version, "blog," was first used by Peter Merholz, who, in April or May of 1999, announced, in the sidebar of his weblog, that he was going to pronounce it “wee-blog” (Juiceenewsdaily.com, 2005; Blood, 2000). Merholz was also the first person to refer to a weblog editor as a “blogger” and define “to blog” as posting to or editing one's weblog (Blood, 2000). Despite these ‘official’ terms, ‘bloggers’ or diarists (escribitionists as they called themselves) existed on the Internet a few years prior (Blood, 2000). For instance, Justin Hall, who is recognized as one of the earliest bloggers, began his eleven years of personal blogging in 1994 (Juiceenewsdaily.com, 2005).

Despite a few early pioneers, who primarily kept casual personal information blogs, blogging did not gain momentum till 1999 when the first wave of people began ‘jumping on the bandwagon’ (Dearstyne, 2005; Blood, 2000). Blood (2000) estimated that at the end of 1998 only 23 sites existed that today could be categorized as weblogs. In early 1999, Brigitte Eaton created the Eatonweb Portal, which was the fist compilation of weblogs on the Internet. Eaton evaluated all submissions to the Eatonweb Portal with only one simple criterion: the site had to consist of dated entries (Blood, 2000). Since then bloggers have debated the definition of a weblog, but because the Eatonweb Portal was the most complete listing of weblogs available, Eaton’s definition prevailed (Blood, 2000).

Usage continued to spread throughout 1999 with the introduction of the first hosted weblog tools. In July of 1999, Pitas became the first free weblog tool on the market. A month later, Evan Williams and Meg Hourihan's company Pyra Labs launched Blogger (purchased by Google in 2004) and Paul Kedrosky launched GrokSoup (Juiceenewsdaily.com, 2005; Blood, 2000). It was not long after that there were hundreds of blogging software tools to choose from (Blood, 2000).

Though weblogs sustained growth over the next two years it was not until after the attacks on September 11th, 2001 that they gained significant readership and became a form of accepted alternative media for social and political commentary. By the end of 2003, top rated blogs Instapundit, Daily Kos and Atrios were receiving over 75,000 unique visitors per day (Juiceenewsdaily.com, 2005).

Since 2001, weblogs have gained increasing notice for their role in breaking, shaping or spinning news stories. In fact, bloggers today provide almost instant commentary on nearly all political and economic events. Blogs have become a medium by which the public keeps pressure on established news sources, as well as a tool by which political consultants, news services and political candidates perform outreach and opinion formation.

Today, there is no question on whether weblog technology will emerge successfully. Technorati (as qtd. in Dearstyne, 2005) estimated that there were more than 9.7 million blogs by early 2005, with about 38,000 more created every day. A January 2005 survey by Pew Internet and American Life Project (as qtd. in Dearstyne, 2005) reported that 7 percent of the 120 million U.S. adults who use the Internet say they have created a blog. Further, 27 percent of Internet users say they read blogs (a 58% increase over survey results of less than a year earlier) and of the ones that read blogs, 12 percent report they have posted comments or other materials.

The use of blogs in an organizational setting is a fairly new concept, which only recently began appearing in business journals and empirical research. Nevertheless, the popularity of blogs will likely continue, therefore it is important for the organization to understand both the technology and its how it may be used to improve efficiency, innovation, and knowledge retention. The next section will attempt to define a weblog and discuss weblog software features.

What is a Blog

In general all weblog definitions have the same basic characteristics; they are web-based hierarchies of text, images, media objects, and data structured in reverse chronological order (Dearstyne, 2005). The definitions also agree that an innate quality of weblogs is their ability to create value and structure through community and referee hyper linking. A majority of definitions prefer to use the term ‘journal’, though this term is only accurate for those blogs used as journals; it does not categorize other uses for the software. Table 14 summarizes some of the weblog definitions identified in the research.

Definition of Weblog	Author Referenced
A personal web page, kept by the author in reverse chronological diary form, it is kept first and foremost on the web, either on a static web page, or via a database backed website, enabled through “blogging" software, As a log of the web, it frequently refers to other Internet locations via hyper linking	Wagner, 2003
A “personalized” “web based” “automated” “community supported” tool, kept in reverse chronological order: Personalized: designed to be used by a single person, expressing individual personality, (but may also be used for multi-person through collaboration). Web-based: They can be updated frequently, are easy to maintain and accessible via a web browser.	Du and Wagner, 2005

Automated: weblogging publishing tools help the author present his/her words in an attractive format, and may even syndicate them. Communities-supported: Weblogs can link to other weblogs and sites, enabling the linkage of ideas, and hence stimulating knowledge generation and sharing.	
Web-based journal in reverse chronological order which allows the writer to post ideas and thoughts quickly using conversional language for many to read. It allows the writer to link easily to other sites for support as well as for examples. And it provides a repository for such items. Also, both readers and writers are unrestricted to time and place.	Flatley, 2005
Frequently updated personal web journals that can dramatically help both small and large companies communicate their product messages. They increase people's ability to share ideas and information exponentially, and on a worldwide scale.	Microsoft as qtd. in Dearstyne 2005
An interactive website that allows the owner to publish ideas and information. Users can read and evaluate material and add new content, creating a conversation that spans time zones and continents.	Accenture as qtd. in Dearstyne 2005
A personal journal on the web that allows millions of people to easily publish their ideas and millions more to comment on them. A fluid, dynamic medium, more akin to a "conversation" than to a library.	Technorati, a blog search engine and measurement firm as qtd. in Dearstyne 2005
A hierarchy of text, images, media objects, and data, arranged chronologically, that can be viewed in an HTML browser. The center of the hierarchy is a sequence of weblog posts each with a title, link, and description.	Harvard Law School as qtd. in Dearstyne 2005
Frequently updated web pages in which dated entries are listed in reverse chronological sequence.	Herring, Scheidt, Bonus, and Wright, 2004

Table 14: Definitions of Weblog

Types of Blogs

As one can tell from the various definitions, blogs may be used in a number of ways. Blog postings may include individual opinions and analysis or offer readers nothing more than a collection of topical links to other blogs, websites or information sources. Blogs may be both public and private. They may provide only narrative text or allow and encourage users to collaborate and comment. The software allows users to be creative in how they use it, making blogs relatively difficult to classify.

Dearstyne (2005) argues that blogs generally fall into five categories, summarized in Table 15. The first two classifications represent more traditional (mainstream) uses for blogs where the last three offer a rare classification of blog uses for within the organization. According to Dearstyne (2005), the last three need special attention from organization leaders because these types of blogs, "constitute organizational information and therefore need information and records management policies."

Type of Blog	Description
Individuals' personal news and views	Personal journals set up by individuals to share news about their lives, families, and personal developments and for personal expression. Particularly popular with teenagers.
News/commentary/journalism	These blogs report the news, provide interpretation and commentary, and in some cases confront and upstage mainstream media.
Advertising/promotion/marketing/customer service	Some blogs promote products and services or communicate with potential customers.
Business/professional issue commentary and insight	May include commentary by CEOs, views of professionals and other employees, trial balloon ideas, results of research projects, and interpretations of the events and trends in the field.
Internal information sharing/knowledge management applications	CEOs are using blogs to share perspectives and policies with employees. Project managers use them to direct and coordinate complex projects, e.g., giving direction but at the same time inviting updates and commentary. Technical experts use them as convenient records of engineering or design projects. Being used as inexpensive content management and knowledge management systems. Can also be used to continually update clients, boards of directors, and other stakeholders.

Table 15: Dearstyne's (2005) Classification of Blogs

Krishnamurthy (2002, as qtd. in Herring, Scheidt, Bonus, and Wright, 2004) proposed a more theoretical approach to classifying blogs into four basic types according to two dimensions: personal vs. topical, and individual vs. community. A schematic representation was reproduced by Herring, Scheidt, Bonus, and Wright (2004) and appears as Figure 1 below.

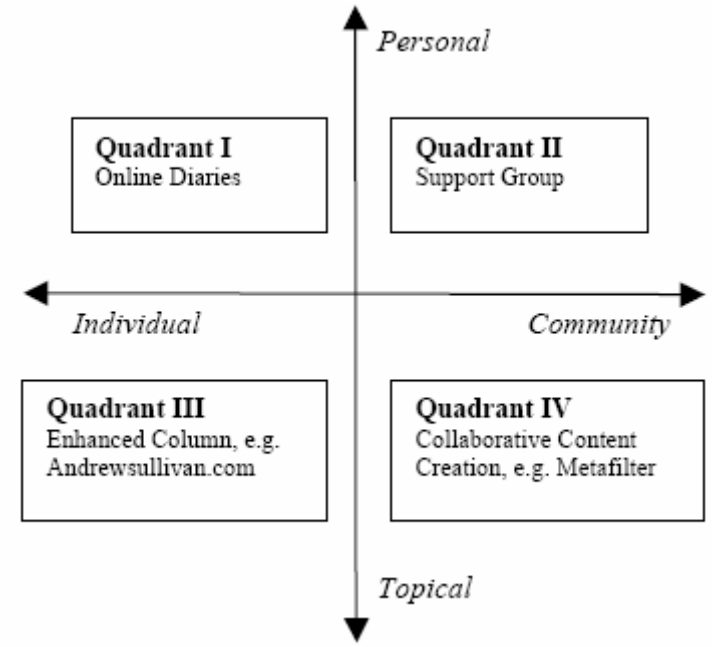

Figure 1: Representation of Krishnamurthy's Types of Blogs (Herring, Scheidt, Bonus, and Wright's, 2004)

Using Krishnamurthy's criteria Herring, Scheidt, Bonus, and Wright (2004) further classified blogs into five categories for the purpose of their investigation. These categories were Personal Journal, Filter (type of blog where the blogger "pre-surfs" the Web and directs readers to selected content), Knowledge-Log or K-Log (discussed in detail later), Mixed (combine the functions of two or more of the first three types) or Other ("serve miscellaneous other functions"). To get a sense of how blogs were being used (between March and May of 2003) the authors analyzed a random sample of 203 blogs, their results are presented in Table 16 below. It appears from looking at the results of the survey that personal journals represent over seventy percent of blogs surveyed, what does not seem clear is how many of those are used inside an organization or for organizational benefits. It would seem that businesses could benefit from personal journals, filters, K-logs or a combination of all of them (mixed). With things like Warblogs (political weblogs), private diaries, marketing-blogs and K-Logs all subsumed under the term weblog, it becomes difficult to classify types (Röll, 2003). As an example, Schwartz may say that his blog is mixed, covers the last four types of Dearstyne's classifications and may fall in any of Krishnamurthy's quadrants**.**

Type	Frequency	Percentage
Personal journal	140	70.4
Filter	25	12.6
K-log	6	3.0
Mixed	19	9.5
Other	9	4.5
	199	100

Table 16: Distribution of Blog Types According to Their Primary Purpose (Herring, Scheidt, Bonus, and Wright, 2004)

Röll (2003) points out that it is critical to find a new "terminus for applications of Weblogs in Business" but this is much easier said than done. Since various types of different blogs may be beneficial to the same business processes, perhaps the best definition for a business weblog is simply – a tool implemented in organizational processes (i.e. research, marketing, knowledge management, etc.) for creating and sharing web-based hierarchies of text, images, media objects, and data structured in reverse chronological order.

A Technological Overview

According to Herring, Scheidt, Bonus, and Wright (2004), a weblog forms, "a de facto bridge between multimedia HTML documents and text-based computer-mediated communication." Technically, a weblog is a hierarchy of text, images, media objects and data, arranged chronologically, that can be viewed in an HTML browser (Dearstyne, 2005). The center of this hierarchy is a sequence of weblog "posts" which forms the index of the weblog, that link to all the content in sequence. Every time an update is put on a blog, a post is created (Gardner, 2005). Each weblog post is a self contained topical unit containing three distinguishing characteristics: a date header, a time stamp, and a permalink (Hourihan, 2002). It is also common for the authors name to appear beneath the post.

The post's time stamp relays the sense of timely content. According to Hourihan (2002), "the implicit value of time to the weblog itself is apparent because the time is overtly stated on each post."

When a user makes a reference to a specific post, they link to the archived version (or permanent one) using a permalink (Winer, 2003). The permalink allows for precise referencing, and is often displayed as a pound sign (#). According to Winer (2003) it is always a good idea to include a permalink in order to allow others to point to your posts. According to Hourihan (2002) it is the presence of these links that creates the connections that bind weblogs.

Another identifying characteristic of blogs is the ability of visitors/members to leave comments. Posts commonly link to reader comments and to the responses from the author (Winer, 2003). In this sense, blogs become a forum for interacting (Flatley, 2005) and are often referred to as conversational technologies. Commenting can either be built into the software, or added by using a service such as HaloScan (Juiceenewsdaily.com, 2005). If commenting is included and enabled a link to comment will appear on the post

(Hourihan, 2002). When someone decides to comment they are commonly asked to provide name, email, and blog or website address. Each comment is time-stamped and may be organized chronologically or in threaded form. If a blog has regular commenters, this is referred to as the blog's community. Some blogs do not have comments, or have a closed commenting system which requires membership or editorial approval.

Each post may be easily edited online using an 'Edit This Page' button (assuming you have editorial permission). Once changes are made simply clicking the 'save' button publishes the new content to the web. Traditionally, one must have some level of membership in order to post or comment. More sophisticated weblog software packages come equipped with editorial systems which may restrict the permission to create new posts, write stories, edit the navigation structure of the site, or edit the templates (Winer, 2003). In Manila, for example, there are five levels in increasing privilege: nonmember, member, contributing editor, content editor, and managing editor (Winer, 2003).

Hourihan (2002) found that a majority of weblog posts take a more 'conversational tone' as opposed to 'more formal essay or speech'. According to Hourihan (2002), "a blog post is often an opening to a discussion, rather than a full-fledged argument already arrived at." Additionally, most weblog posts are short (only a paragraph or two) though most weblog software packages do allow for longer posts, by including a place for a summary. A posting may also be supplemented with additional forms of content such as pictures and media objects (Microsoft file formats, movies, PDF, downloadable applications, etc.).

Due to the chronological nature of weblogs, when a reader visits a weblog, they are always confronted with the newest information at the top of the page (some weblogs show you the last 15 posts or the last 7 days) (Hourihan, 2002; Winer, 2003). The home page of the weblog displays the current items (usually configured by the editor) making it easy to see what is new or has changed. If content has been added since the last visit, it becomes clearly evident. According to Hourihan (2002), "weblogs demonstrate that time is important by the very nature in which they present their information…setting the expectation of updates, an expectation reinforced by our return visits to see if there's something new."

Features of a Blog

Besides providing the user with an easy way to publish web content and submit comments, blogs have a number of secondary applications or features that assist in archiving, linking, searching, notifying, and navigating content. Though not all of these features are available on all blogging software tools, a number of them allow for these features to be added through programming or module attachment. A thorough list of additional blog features is presented in Table 17. Each feature is briefly described and the referenced author is included.

Weblog Feature	Description	Author Referenced
Categories	A post can be categorized or placed in a department. Categories permit a blogger to subdivide content and helps readers read only what they are most interested in. Good tool for scanning a blog's archives.	Winer, 2003; Gardner, 2005
Archive Page URLs	The Web addresses for archive pages, if properly constructed, can form a user interface for the weblog.	Winer, 2003
Calendar	The home page and each archive page of the weblog usually displays a calendar that allows the reader to easily locate the archive pages by time. archival of past weblogs by date-posted,	Winer, 2003; Du and Wagner, 2005
Templates / Skins	Most blog software includes a set of pre-designed templates that give the blog a certain look and feel. These are called skins. The posts are then rendered through the chosen set of templates.	Gardner, 2005; Winer, 2003
Syndication	Syndication is a big deal. With millions of blogs to read, many users employ news aggregators, or readers, to pull in posts and read them. Syndication allows your blog content to be pulled by other users' aggregators. If the weblog has categories or departments each has its own feed. RSS and Atom are two types of blog syndication.	Gardner, 2005; Winer, 2003

News Aggregation	Many blog software packages allow you to pull in and display the RSS or Atom feed of another blog or news source. This is useful if you want to create a filter style blog and put all relevant information in one place for review	Gardner, 2005; De Moor and Efimova, 2004
Trackback	Trackback technology helps bloggers link back to other posts on related subjects Once the target post's Trackback URL is pasted into the allotted spot in your blogging software, the two pieces of blog software will communicate, building a link from the original post and yours.	Gardner, 2005; De Moor and Efimova, 2004; Juiceenewsdaily.com, 2005; Du and Wagner, 2005; Winer, 2003
Pings	Some blog software allows you to ping blog search sites. When the post is made, that post gets included in the ping site's index, potentially increasing traffic.	Gardner, 2005
URL Redirection	In an effort to render comment and Trackback spam ineffective, links included in comments and Trackbacks are tagged with the NOFOLLOW tag, which indicates to search engines that it shouldn't be counted when tallying search engine rankings for a Web site.	Gardner, 2005
Notification via email or IM	Some weblog software can automatically notify editors or community members if new posts, pictures, media objects, articles, or comments have been posted.	Winer, 2003

Plug-in architecture	Some weblog tools define a way for developers to add plug-ins.	Winer, 2003
API Support	Many weblog tools implement some kind of programming interface, making it possible for external tools written in any programming or scripting language to automate repetitive operations, or to integrate the weblog tool with other software.	Winer, 2003
Mailto	It's possible to send an email message to the author of a post without knowing the email address of the user.	Winer, 2003
Bulletins	Manila has a feature that allows editors to send bulletins via email to members who have chosen to receive them.	Winer, 2003
Referrer Tracking	Some weblog software automatically tracks the client browser's referrer attribute so that authors can easily see where the hits are coming from.	Winer, 2003
Rankings	Various rankings are available in some weblog tools to provide information on who's getting the most traffic and who's pointing to whom.	Winer, 2003
Shortcuts	A shortcut is a quick way to link to a page without having to use HTML, a highly valued feature for non-technical users.	Winer, 2003
Author Information Page	Each member can have a page where information gathered about the user is displayed. The editors of the site can decide which information is displayed.	Winer, 2003

Discussion Group	Some weblog software comes with a complete threaded discussion group. All posts have a dual existence, in the form that's viewed by readers of the site, and as a DG for the editorial team.	Winer, 2003
Blogroll	A blogroll is a list of the blogs read by the blogger whose site it is. This is one means by which a blogger creates a context for the blog (by listing other blogs that are similar to his/her own). It is also used as measure of the number of citations a blog has, and is used to rank "blog authority" in a manner similar to the way that Google uses hard coded HTML linking. Still another use of the blogroll is reciprocal linking.	Winer, 2003; Gardner, 2005; Juiceenewsdaily.com, 2005
Hierarchy Browser	Using OPML as the format for describing hierarchies	Winer, 2003
Slide shows	Similar to the Hierarchy browser feature, but for displaying PowerPoint-like presentations	Winer, 2003
Moblogging	Moblogging is short for mobile blogging. Many blog software packages let you post by e-mail from your phone, PDA, or anything else that allows you to send e-mails.	Gardner, 2005
Blacklist	Blacklists are usually lists of URLs that have been identified as spam URLs, and that are therefore eliminated from comments and Trackbacks on the blog.	Gardner, 2005

Captchas	Captchas are an additional security feature for commenting and user registration. By providing an image that includes letters and numbers, and by requiring the user to type in those letters and numbers, blog software can eliminate some of the comment and Trackback spam produced by robot programs.	Gardner, 2005
Post scheduling	Some blog software allows you to write posts and schedule them to be published at some point in the future.	Gardner, 2005
Bookmarklets	A bookmarklet is a link directly to the new post page of the blog software. If one adds this small Javascript to their browser toolbar, it becomes a shortcut to posting quickly.	Gardner, 2005
Audio Posts	One new add on tool allows one to call in to make audio posts.	Flatley, 2005
Other Add-ons and Features	Photo albums, guest books, polling tools, and quizzing capabilities.	Flatley, 2005

Table 17: Summary of Weblog Features

A Functional Overview

From the users perspective blogs have a number of functional benefits. First, posting to a blog has a relatively low learning curve, and can be as easy to learn as posting to a wiki. A second benefit to a user is the control over content (Herring, Scheidt, Bonus, and Wright, 2004). Once a blog post is made, only the author has the authority to alter it. Unlike a wiki, a blog gives the author a medium where their ideas can stand alone without interference (Winer, 2003). A third functional advantage of blogs is their ability to maintain the aforementioned content independence while at the same time providing a platform which is characterized as, “socially interactive and community like in nature” (i.e. posting comments gives rise to "conversational" exchanges) (Herring, Scheidt, Bonus, and Wright, 2004). Ideally, this means that authors are able to experience social interactions without giving up any control over the communication space.

Herring, Scheidt, Bonus, and Wright (2004) feel that blogs have these functional advantages because of their 'intermediate nature'. According to the authors blogs bridge a technological gap along several dimensions depending on how they are used (represented schematically as a continuum, in Figure 2). By looking at the continuum one can see that online journal sites have less interactivity, and are therefore are closer to standard Web pages. Community blogs, on the other hand, are more similar to online discussion groups in their frequency and exchange of messages among multiple users making them closer to asynchronous CMC. Once again, it becomes apparent how difficult blogs are to classify.

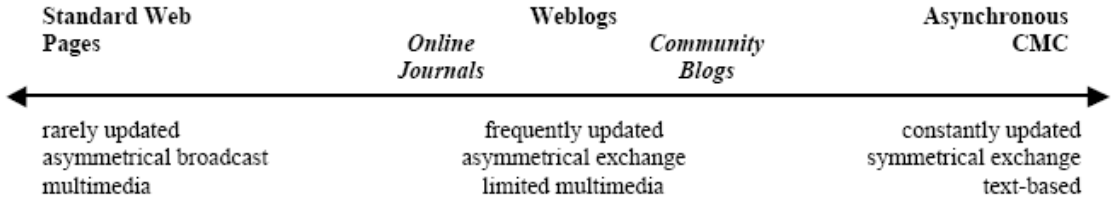

Figure 2. Weblogs on a continuum between standard WebPages and CMC (Herring, Scheidt, Bonus, and Wright, 2004)

User Analysis

This section will briefly explore blog author characteristics identified from the findings of a 2003 study conducted by Herring, Scheidt, Bonus, and Wright (2004) on a random sample of 203 blogs. Though the research may now be slightly dated, the findings can be relevant in examining and comparing future usage patterns.

Upon examination, the authors (Herring, Scheidt, Bonus, and Wright, 2004) found that the characteristics of blog authors were not significantly different from the demographics of users of other 'public Internet communication protocols' (i.e. discussion forums and personal homepages). A majority of the users were young adult males residing in the United States with the most frequent occupation being a student (57.5%). Technology related occupations (i.e. web developer, system administrator, and computer programmers) came in second at 18.9%. The authors (Herring, Scheidt, Bonus, and Wright, 2004) also found that females and teens were more likely to create and maintain personal journals; where adult males were the most likely to create filter blogs, k-logs, and 'mixed' blogs. The findings are summarized in Table 18 below.

Characteristic	Frequency	Percentage
One author	196	90.8
Male	110	54.2
Adult (20 years or older)	115	59.6
Student	73	57.5
Located in USA	104	69.8
Name on first page (other than pseudonym)	127	67.6
Other personal information on first page	108	54.0
Graphical representation on first page	34	17.5

Table 18: Herring, Scheidt, Bonus, and Wright's Blog Author Characteristics (2004)

How to Work a Blog

Learning how to use a blog depends on the blogging software one selects. In a majority of cases, posting, searching, navigating, commenting and archiving is quite intuitive and done through a web panel. To begin the author signs in to the software using a user name and password, selects a new post, writes the entry, and publishes using a save button. The blogging software then automatically handles aspects such as formatting, design, arrangement in chronological order, and (ftp) upload (Wagner, 2003). If the author wants to change content, categorize, archive, or respond to comments, this is also traditionally done through the web panel. Most blogging software packages come with explicit use instructions, which can be learned in a relatively short time.

Organizational Benefits of a Blog

Some of the organizational benefits of a blog extend directly from the user benefits mentioned above. As proven from the numerous types of existing blogs, a blog can be structured according to the needs of its users (Röll, 2003). This allows the user or enterprise to focus on the actual content, and not worry about record keeping or archiving activities (Wagner, 2003). Blogs have also been referred to as vehicles for self expression and self empowerment (Herring, Scheidt, Bonus, and Wright, 2004). Blood (2000) discusses how she discovered her own interests by virtue of writing them down. For organizations, this is a great method by which to brainstorm, develop research, and store and share knowledge. Employees will also attain basic knowledge on web page creation, hyper linking, and the nature of the World Wide Web (Wagner, 2003).

Research done on blogs in the classroom setting has found that students using blogs, "seem to be more attuned to their assignment and to their group members, they both read and wrote more than past groups who had not used blogs, [and] they reported that the use of the blog enhanced their motivation (Flatley, 2005). Flatley (2005) also found that blogs created an easy way to identify group slackers early in the project lifecycle. In their study, Du and Wagner (2005) found that blogs reinforced both collaboration and individual accountability by remaining non-anonymous, mandating and allowing for individualized feedback, and providing a medium by which students could benchmark and self-assess. Students, who compared their work against others, could determine the general performance level of their peers, raising the overall performance level. In an earlier piece of research, Wagner (2003) found blogs to be ideal for supervision in the classroom where the instructor monitored published weblogs. This monitoring served as an incentive for students to keep their logs up-to-date. Additionally, at the end of each project there was no need for the instructor to convert student documents and publish them since this had already been done by the software.

By providing a beneficial filtering function for their users, blogs are also excellent organizational tools for finding information. In a sense, a filter blog has already pre-surfed the web or intranet for the user (Blood, 2000). Filter blogs provide value by highlighting hard to find topical documents, "by searching out articles from lesser-known sources, and by providing additional facts, alternative views, and thoughtful commentary" (Blood, 2000). In turn, the editors of these filter blogs become valuable

participants in the dissemination and interpretation of knowledge in their area of focus; transforming them into organizational experts.

A majority of the organizational benefits associated with blogs fall in the category of group benefits. The first example involves using blogs as a conversation medium. De Moor and Efimova (2004), feel that although blogs were originally intended for individual use, in practice they, “increasingly appear to facilitate distributed conversations”. In the authors opinion, blogs are ideal for distributed conversations because of their hyperlinked structure. The links created within a blog also create links and conversations between blogs (through trackback) (De Moor and Efimova, 2004). Readers are allowed to join the conversation through commenting or email which is often incorporated back into the content (Hourihan, 2002). In Hourihan’s (2002) opinion this creates, “a nearly real time communication channel between the blog's primary author (its creator) and its secondary authors (the readers who email and comment)”. Blogs may provide the framework for these conversations but the structure of the documents enables the ability to build social networks on top of it (Hourihan, 2002).

According to Jenkins (2003) and De Moor and Efimova (2004), blog conversations (also known as blogosphere stories) are categorized into four types:

1. Opinion posts that define a topic, and usually contain between 3-15 links, one of them being the instigator of the story,
2. Vote posts where a blogger (dis)agrees with another post,
3. Reaction posts in which a blogger responds to a single post on another site, and
4. Summation posts where the blogger summarizes various other blogs.

Jenkins (2003) created a map of a blogosphere story; a visual representation is presented in Figure 3. From looking at the representation it becomes clear that blog conversations can follow numerous paths. Additionally, blogs can be used to support different types of conversation, depending on the context in which they are used (De Moor and Efimova, 2004). One post may trigger (or respond to) a conversation with another user, sometimes leading to several independent conversations happening simultaneously. De Moor and Efimova (2004) referred to the nature of these distributed blog conversations as "hypertext" conversations.

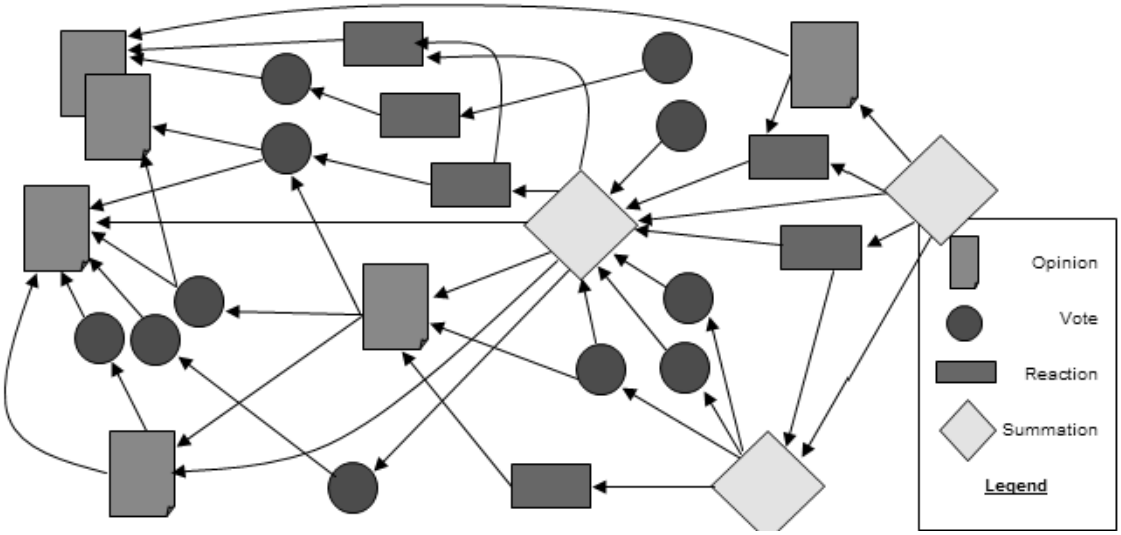

Figure 3: Representation of a Blogosphere Story (Jenkins, 2003)

For enterprises this means that blogs can be used as a communication hub for teams or departments (Röll, 2003). The software supports discussions, document exchange and the central data storage minimizes redundancy (Röll, 2003). Additionally, the archive makes finding old documents easy reducing the volume of email that group members receive (Röll, 2003). De Moor and Efimova, (2004) do warn that, "when moving up to the organizational blog, the voice of the individual is increasingly lost, and the presentation becomes more organizational and anonymous in voice".

In a very similar way blogs have been cited as great tools for facilitating collaboration (Flatley, 2005; De Moor and Efimova, 2004; Du and Wagner, 2005). Individuals may post to a group blog, where emails are sent to all group members when the blog has been updated (Flatley, 2005). This provides everyone in the groups with a chance to see who has responded, their comments, and the timeliness of their response.

Other organizational group benefits of a blog include the ability to build relationships with stakeholders by sharing information, corporate culture and expertise (Gardner, 2005; Wagner, 2003; Dearstyne, 2005) Create opportunities for group learning (Wagner, 2003; Du and Wagner, 2005) and spark creativity and cooperation (Dearstyne, 2005).

Knowledge Management and Blog

Blogs that are created for the purpose of knowledge management within an organization are sometimes called K-logs or k(nowledge)-logs (Herring, Scheidt, Bonus, and Wright, 2004; Röll, 2003; Wagner, 2003). According to Herring, Scheidt, Bonus, and Wright, (2004), "K-logs functionally resemble hand-written project journals in which a researcher or project group makes observations, records relevant references, and so forth about a particular knowledge domain." Röll (2003) points out that K-logs may be used by employees to display their knowledge in order to gain enterprise awareness, or by experts to connect to other experts in their fields. In a broader sense, K-logs are ideal for Informal Knowledge Management where they:

1. Capture knowledge in the moment that it is created or used.
2. Help with the transfer of knowledge between individuals and facilitate the formation of Communities of Interest
3. And make it easy to find experts in the organization (Röll, 2003)

Research on actual K-log implementation or use inside an organization is scarce. Looking back at Table 16, one can see that K-logs only accounted for 3% of blogs surveyed by Herring, Scheidt, Bonus, and Wright (2004).This may be partially due to the technology being new or simply do to the fact that active K-logs may reside on private servers and intranets where researchers do not have access. Though a significant gap in the research exists, one can propose that the archival, search, and categorization features of a blog assist in content organization and retrieval; resulting in a anytime and anyplace (where there is web access) knowledge management system (Wagner, 2003).

Though many authors (Herring, Scheidt, Bonus, and Wright, 2004; Wagner, 2003; Röll, 2003; Du and Wagner, 2005; De Moor and Efimova, 2004) have commented on the use of blogs as a knowledge sharing tool, once again research in the area is limited. Du and Wagner, (2005) were able to demonstrate some empirical evidence by showing that blogs are useful in a classroom as a knowledge sharing medium and a cognitive learning tool. Röll (2003) argues that because of the nature of the blog network, organizational barriers are lowered. With lowered organizational barriers, Röll (2003) feels that information/knowledge is transferred more easily between projects, departments, groups and individuals. Röll (2003) also argues that these conditions are ideal for communities of interest/practice to form and collaborate. De Moor and Efimova (2004) provide a similar argument stating that knowledge sharing exists as a byproduct of the links that tie different blog communities together. They further argue that the diverse interests of the authors in these communities, makes them each an independent knowledge broker.

Knowledge creation using a blog is yet another underdeveloped research area. Du and Wagner (2005) make the most compelling argument which was derived from their empirical research inside a classroom. The authors argue that keeping weblogs requires students to actively construct meaning and organize their thoughts, something they call ‘active knowledge construction’. Students therefore gain an overall understanding, “through analysis and interpretation of knowledge and information” (Du and Wagner, 2005). Knowledge is also created through ‘incremental improvement’’ which allows students to build their knowledge and understanding over time (Du and Wagner, 2005). Finally, the authors (Du and Wagner, 2005) argue that knowledge is created through ‘self directed learning’ where blogs assist students in identifying what they have learned and areas for self improvement.

Blog communities can also offer assistance in knowledge sharing and creation. For example, users learn from the ideas of others, become exposed to diverse perspectives, participate in dialogic texts, identify new knowledge sources, and reflect on the involvement of multiple parties. De Moor and Efimova’s (2004) analysis suggests that blog conversations, “enable the interplay between articulating ideas in a personal space

and social cross-fertilization, in a form of perspective making and perspective taking, thus creating potential for developing innovative ideas [or creating knowledge]."

Blog Shortcomings

A 2003 survey by Perseus Development Corp. (as qtd. in Dearstyne, 2005) revealed that more than 60 percent of blogs on the Internet were inactive or abandoned. Though interest in blogging has skyrocketed since, there are a number of concerns with respect to blogs that organizations must consider to assure theirs does not end up inactive or abandoned. The first is the complexity involved in structuring and assembling fragments of 'conversations' in order to create meaning (or a comprehensive central repository). This fragmentation also slows down posting response time, effectively slowing the overall 'conversation' down (De Moor and Efimova, 2004).

A second concern with respect to blogging in organizations deals with the fear that sensitive data will be divulged (Röll, 2003). Having a blog does increase the chance that sensitive data may leave the company. This problem has a much broader context as in most organizations employees have other means by which to divulge information such as ftp, email, instant messaging, and a web browser. A similar concern relates to the idea that employees can publicly write what they want, including negative statements about the company or other inappropriate (not officially approved business) content (Holtz, 2005). This concern can be controlled by defining 'appropriate content' and creating organizational blogging policy (discussed later).

A third concern relates to new blog associated costs to the organization. These costs could take the form of abandoning existing collaborative or knowledge technologies (Röll, 2003) or be calculated as wasted man hours and productivity. Employees must take time out of their already busy schedules to both author and read blogs (Holtz, 2005). Managers likely quantify the man hours inputted into the blogging but have a more difficult time quantifying the value of their output. Holtz (2005) argues that the overall productivity of the organization will actually increase from blog authoring because information and knowledge moves more freely throughout the organization. Further, the time investment in reading the blogs will help employees solve problems and obtain the knowledge they need (Holtz, 2005). One last associated cost involves the additional bandwidth requirements needed to accommodate thousands of employees pinging the company server (Holtz, 2005). If blogs become popular in the organization, bandwidth requirements will increase.

A fourth concern is spam on the blog. In blogging there are two kinds of spam. Comment spam which is left in the comments of a blog and trackback spam which is like comment spam, but done through trackback (Gardner, 2005). The point of spamming a blog is to create a link back to the spammer's website. As the spammer gets more links to their website, their search engine rankings increase. Though there is no way to permanently prevent spam, it may be decreased by selecting a more protective blogging software, keeping the blog on the company intranet, and by reporting known spammers.

The last concern with blogs is also extended to wikis. Even if an organization can get people to use a blog, getting them to share their knowledge is often quite difficult (Holtz, 2005). Many people still feel that knowledge is power and that by sharing their knowledge on the blog they are relinquishing this power. To suppress this fear and reassure their employees, organizations should work to establish fair blogging policies with clear statements on intellectual property rights.

Practical and Existing Blog Applications

Previous sections of this paper have summarized the benefits of a blog and argued for its use as a communication medium as well as a knowledge management tool. This section will summarize other practical organizational uses of a blog and examine how some large Fortune 500 companies use blogs. Table 19 below categorizes some of these practical organizational uses and describes them in more detail.

Practical Blog Use	Description	Authors Referenced
Personal Journal	Medium for offering relevant opinion and commentary on conversations and stories that appear outside the company or on the web. Ideal for individual brainstorming, and personal knowledge management.	De Moor and Efimova, 2004; Kharif, 2004; Flatley, 2005; Herring, Scheidt, Bonus, and Wright, 2004; Röll, 2003; Schwartz, 2005; Dearstyne, 2005; Holtz, 2005; Hourihan, 2002; Blood, 2000
Project Management	As a project notebook, a place for brainstorming about strategy or process, a medium for sharing content, and a forum for communication.	De Moor and Efimova, 2004; Kharif, 2004; Röll, 2003; Holtz, 2005
Filters (Knowledge Directories)	Knowledge directories on particular topics. Usually a filter blog reflects material in the external world (links to relevant websites and articles), but can also amalgamate information on an Intranet, company content management system, or library.	De Moor and Efimova, 2004; Herring, Scheidt, Bonus, and Wright, 2004; Blood, 2000
Customer Relationship Management	Posting customer relevant information publicly and allowing customers to interact (i.e. host open letters from the outside regarding consumer complaints or vulnerabilities in products or services). May also be used by salespeople to share the substance of customer visits or phone calls.	Kharif, 2004; Schwartz, 2005; Juiceenewsdaily.com, 2005; Holtz, 2005

Forums for Innovation / Product Development / Business Strategy / Best Practices	Discover new business ideas worth funding. Discuss the nature of the competition or market. Share opinions, stimulate discussion, or garner ideas for research and development, business strategy, and successes/mistakes (best practice).	Kharif, 2004; Schwartz, 2005; Dearstyne, 2005
Forums for Company News	Report and discuss company news which may include company values, human resource and other policy information, announcements of achievements and rewards, or seminars and training programs. May also be used to report and discuss industry or departmental news.	Schwartz, 2005; Dearstyne, 2005; Holtz, 2005
Simple Content Management Systems	Content Management Systems to publish regularly updated content to company websites.	Röll, 2003
Collaboration and Communication	As a tool to facilitate and mediate collaboration and communication: discussed in detail in a previous section.	De Moor and Efimova (2004); Hourihan, 2002; Jenkins, 2003; Röll, 2003; Flatley, 2005
Marketing Tool	As an instrument in marketing to communicate with Internet users. This may be done through direct marketing or by sponsoring industry blogs.	Röll, 2003; Schwartz, 2005; Dearstyne, 2005

Table 19: Practical Blog Uses

For all the uses mentioned above, blogs are starting to become staples in some of the largest and most innovative companies in the world including: Microsoft, IBM, Verizon, Boeing, Hewlett-Packard, Intel, and Sun (Dearstyne, 2005). Kharif (2004) is even quoted as saying that Bill Gates is considering starting his own blog which would add to the more than 700 at Microsoft already. These companies only represent a few of the major Fortune 500 companies with blogs in use today. With the need to provide further visibility and credibility that number will incontestably continue to grow. Table 20 in the Appendix provides more detail into how some of these organizations are employing blogs.

Selecting a Blog Software

With hundreds of blog software packages available, ranging in their level of features, modules and customization options; selecting the correct blog software can be an important decision for organizations. Choosing the right blog allows organizations to minimize the learning curve involved with deployment as well as customize to their desire (Gardner, 2005).

According to Gardner (2005) there are two kinds of blog software available. The first is hosted blog software where all the data and interface reside on the server of the blogging software company. The second type is independent blog software that must be downloaded from the blogging software company and installed on the company's web server. In either case, the blog is set up and controlled by a database that manages the posts and permits for searching and archiving (Gardner, 2005). The aesthetic layout and formatting commands of most blogs are controlled by the software through a set of templates of CSS files.

Downloaded or using blog software may involve a fee. When using the free services, users should expect to find some form of advertising somewhere in the blogging process (Wagner, 2003). More advanced bloggers prefer to use server-side software tools (i.e. Nucleus CMS, Movable Type, bBlog, WordPress, b2evolution, boastMachine and Serendipity) to publish on their own server. This is also the best choice when hosting a group of blogs for an enterprise. These more advanced programs provide greater flexibility and power, but do require more knowledge (Juiceenewsdaily.com, 2005).

With a vast number of blog software package, it is difficult to summarize all their benefits in the context of this work. Some of the more popular ones include: Blogger, LiveJoumal, TypePad, Radio UserLand, Movable Type, GreatestJournal, Pitas, Xanga, Blogware, WordPress, and Expression Engine. In their 2003 study Herring, Scheidt, Bonus, and Wright, (2004) found that Blogger was the most popular used by 63.2% of surveyed blogs and Movable Type can in second with 11.4% (Table 21).

Software name	Frequency	Percentage
Blogger	122	63.2
Movable Type	22	11.4
Pitas	13	6.7
Radio Userland	6	3.1
All others combined	14	7.3
Unknown	16	8.3
	193	100

Table 21: Herring, Scheidt, Bonus, and Wright's Most Frequently Used Blog Software (2004)

Gardner (2005b) compared many of the features of the most popular blogs software packages available, this comparison can be found in full as Table 22 below. Additional comparison charts and details on popular blog software packages may be found in the Appendix as Table 23 and Table 24.

Functionality	Blogger	TypePad Basic	TypePad Plus	TypePad Pro	Blogware	WordPress	Movable Type	Expression Engine
Comments	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Categories	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Subcategories	No	No	No	No	Yes	Yes	Yes	Yes
Trackbacks	Yes (Backlinks)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pings	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RSS	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Atom	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Search	No	No	No	No	Yes	Yes	Yes	Yes
Blogroll/Lists	No	Yes	Yes	Yes	Yes	Yes	No	No
Number of blogs	Unlimited	1	3	Unlimited	1	1	Determined by license	Unlimited
News Aggregation	No	No	No	No	Yes	No	No	Yes
Extras	**Blogger**	**TypePad Basic**	**TypePad Plus**	**TypePad Pro**	**Blogware**	**WordPress**	**Movable Type**	**Expression Engine**
Moblogging	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Photo Galleries	No	Yes	Yes	Yes	Yes	No	No	Yes
Non-blog pages	No	Yes	Yes	Yes	Yes	Yes	No	Yes
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
Maintenance	**Blogger**	**TypePad Basic**	**TypePad Plus**	**TypePad Pro**	**Blogware**	**WordPress**	**Movable Type**	**Expression Engine**
API	Blogger	Blogger, MetaWeblog, MT, Atom	Blogger, MetaWeblog, MT, Atom	Blogger, MetaWeblog, MT, Atom	MetaWeblog	Blogger, MetaWeblog, MT	Blogger, MetaWeblog, MT, Atom	MetaWeblog, Blogger, MT
Logs	None	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Data Storage	Database	Database	Database	Database	Database	Database	Database/No database	Database
Spam Fighting Tools	**Blogger**	**TypePad Basic**	**TypePad Plus**	**TypePad Pro**	**Blogware**	**WordPress**	**Movable Type**	**Expression Engine**
Blacklist	No	Yes	Yes	Yes	Yes	Yes	No	Yes
Visitor registration/login	Yes	No	No	No	Yes	Yes	Yes	Yes
Captchas	Yes	No	No	No	No	No	No	Yes
Moderation	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
URL NOFOLLOW	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IP/User/URL banning	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Comment Notification	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Design	Blogger	TypePad Basic	TypePad Plus	TypePad Pro	Blogware	WordPress	Movable Type	Expression Engine
Skins	33	25	25	26	23	2	7	27
Admin panel design configuration	No	No	Yes	Yes	Yes	No	No	No
Admin panel layout configuration	No	Yes	Yes	Yes	Yes	No	No	No
Publishing Interface	**Blogger**	**TypePad Basic**	**TypePad Plus**	**TypePad Pro**	**Blogware**	**WordPress**	**Movable Type**	**Expression Engine**
User Levels	Yes	No	No	Yes	Yes	Yes	Yes	Yes
Multiple authors	Yes	No	No	Yes	Yes	Yes	Yes	Yes
Image uploading	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Image thumbnailing	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Post scheduling	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Save without posting	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bookmarklets	No	Yes	Yes	Yes	Yes	Yes	Yes	No
Edit Templates Online	Yes	No	Partial	Yes	Yes	Yes	Yes	Yes
Edit Templates Offline	No	No	No	No	No	No	Yes	Yes
File uploading	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Password Protection	No	Yes	Yes	Yes	Yes	Yes	No	Yes
Localization	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Work offline	No	No	No	No	No	No	No	No

Table 22: Gardner's Popular Blog Software Comparison Chart (2005b)

Keys to successful Implementation of a Blog

Successful organizational implementation of a blogging system involves more than the installation and training of the technology. The company must be prepared for this technology much like they would be for any new technological rollout. This section aims to offer advice and explore suggestions, identified in the research, for successfully implementing blogs in enterprises.

Dearstyne (2005) suggests that prior to introducing blog software into an organization it is important for management to answer to the following ten questions:

1. How should we separate the "hype" from realistic assessments as a way of gauging the importance and potential applicability of blogging in our organization?
2. What are the most impressive, provocative, or influential blogs in our field, and what gives them those characteristics?
3. What criteria or measures should we develop to evaluate the advantages, disadvantages, costs, paybacks, and overall impact of blogging?

4. What are the appropriate leadership, policy, education, review, and oversight roles for the CEO, program managers, CIO, counsel, records managers, and other information professionals?
5. Where/how is blogging likely to affect or fit into our overall strategic information management strategies and objectives?
6. How do we foster and support individuals' spontaneity and creativity and at the same time protect the organization's interests?
7. Should employee blogs be defined as official, personal, or some other category?
8. What legal and other policies do we need to have in place before permitting or encouraging blogging?
9. How will we handle the records management issues associated with blogging?
10. What IT capabilities do we need to support blogging?

Once the organization has thoroughly answered Dearstyne's questions they may begin defining a blogging strategy. This blogging strategy will involve everything from tool selection, technological capability assessments, and clear and fair blogging policies and guidelines. Policies are created to govern language and content, determining what is and is not appropriate material for posting (Holtz, 2005; Schwartz, 2005). Policies may govern statements of opinion or more fragile issues such as guidelines for guarding against professional and trade secrets (Dearstyne, 2005). An example of Sun's blogging strategy and guidelines may be found at www.sun.com/aboutsun/media/blogs/policy.html (Schwartz, 2005)**.** Other examples of blog policies may be found at www.thenewpr.com (Holtz, 2005).

A blog strategy should also determine the nature of the information on the blog. If, for example, the information on the blog is to be considered as an 'official' company record, it must be dealt with in that fashion. If the information on the blog becomes a record, the company must provide, "workable access, indexing tools, authenticity, preservation, appraisal, scheduling, storage, and access for as long as needed for administrative, legal, research, and other purposes" (Dearstyne, 2005). This highlights the need to link a good blogging strategy with an effective information management strategy. In terms of training, it may be best for information professionals to take the lead, since they must eventually deal with the content on the blog. Based on their information management strategy they can provide insight into what the organization views as 'optimal use'. This may involve, "stressing the need for care and accuracy in postings, pointing out the need for following policies, developing or helping to develop training courses, [and] integrating blogs with other aspects of records and information management" (Dearstyne, 2005).

Despite the amount of planning it requires to launch a blog in an organization, it is important for management to remember that once the blog is set up and running to not micromanage the process of actual employee blogging (Schwartz, 2005). According to Herring, Scheidt, Bonus, and Wright, (2004), the most insightful or controversial posts get the most attention. Therefore, managers should convey the importance of each of their bloggers 'finding a voice', using humor, and linking to those that interest or influence them (Schwatz, 2005). The key to constructing an appropriate environment is

for management to create an 'open, transparent, and meritocracy-based' communication channel (Kharif, 2004). Employees should be encouraged to listen to feedback and respond to legitimate ideas from both inside and outside the organization (Schwatz, 2005). All users should be respectful of their audiences and never treat blogging like advertising.

In his work, Röll (2003) suggests a systematic rollout or implementation of blogging software in order to deal with resistance which may come from the introduction of a new software/concept in the organization. Röll's "Approach to Constructing a Weblog-Infrastructure" involves the rollout of blog software in four distinct steps/phases which are summarized below.

The first step, which Röll (2003) calls the Pilot Scheme, involves the use of a blog on an early stage cross-departmental project (made up of 5-30 members). Once the project manager is trained on the system, the weblog is used as a central repository for project information and documentation. Every project member should have access to publish and edit content and all project documents should be published directly to the blog or be referenced from it. Further, every message that is relevant to more than one recipient should be blogged.

Beginning the rollout with a 'Project Weblog' offers advantages because:

1. A project has a goal and a clearly defined end point at which its results can be evaluated.
2. The fact that the team members come from different departments makes it easier to transfer what has been learned about weblogs to other departments once the pilot scheme is finished. (Röll, 2003)

The Project Weblog should:

1. Reduce the volume of email received be the project team members
2. Reduce training time for new team members
3. Effectively archive project documentation
4. Document the project progress
5. Lower data redundancy. The weblog should always have the most up-to-date information. (Röll, 2003)

At the beginning Röll (2003), advises users to blog as much as possible. If the volume of content grows past a manageable amount, filters can be introduced. Once the project is over, it should be analyzed; questions suggested include:

1. How often has the weblog been accessed?
2. How often has something been published to the weblog?
3. Which team member posted? Who posted often, who did not post at all?
4. What kinds of entries were written? (General information? Announcements of new documents? Announcements of events? Discussion of ideas or change requests? External news important to the project?) (Röll, 2003)

The second step of Röll's (2003) "Approach to Constructing a Weblog-Infrastructure" encourages 'Project and Departmental Weblogs'. This is where departments start their own weblogs to communicate news, departmental reports, experiences, or suggestions for improvements. If departmental websites already exist, they can be augmented by the blog.

The third step is called 'Weblogs in Workgroups and CoIns/CoPs'. This stage allows groups to form which may not be formally recognized. These groups tend to be topical in nature, offering knowledge about a subject. These groups and blogs do not have clearly identified goals (as is seen in steps 2 and 3), though they do provide groups with the ability to exchange information and knowledge. The last stage in Röll's "Approach to Constructing a Weblog-Infrastructure" is 'Personal Weblogs'. In this stage, users create a personal knowledge repository or K-log. These blogs may take any form of explicit organizational knowledge.

Though organizations may not want to employ the exact type of rollout strategy as suggested by Röll, there are, at minimum, some important points to be learned from his analysis. First, it is best to start small, with a pilot, so that the organization can analyze the relative success of the tool before spending too much money deploying it throughout the organization. A second point taken from Röll is the importance of letting the users create the structure and content of the blog, allowing knowledge to naturally flourish. Finally, people should be trained from different functional units so that the organization can truly see if there are cross functional benefits to implementing a blog.

Wikis vs. Blogs

This research paper has examined both wikis and blogs in great detail, but has yet to compare the two. Realistically, comparing the two can be quite difficult since any comparison would greatly depend on which blog or wiki software package one chooses. As discussed previously, any particular installation may have a number of modules or plugins attached. More advanced blog and wiki systems, those with numerous modules and plugins, more resemble content management systems (CMS) rather than traditional blogs or wikis. In a parallel fashion, most open source content management systems (i.e. PHP-Nuke, Post-Nuke, Mambo, etc.) contain both a wiki and blog module with their basic installation. Tonkin (2005) even suggests that programmers have created a 'bliki' which is a mixture of the blog and the wiki. With a bliki articles are posted on a journal in date order, but remain editable to other users; making a bliki a wiki in which articles are added by date and not by keyword.

Despite the difficulties in comparing blogs and wikis there are three functional differences between the two. First, wikis allow their collaborators to edit, modify, and delete content (Dearstyne, 2005). Blogs, on the other hand, protect the originators content, only allowing readers to add additional threaded comments. For this reason, wikis may be better for collaborative writing, but worse for personal knowledge repositories or news. A second fundamental difference between the two is in how they store their data. Since weblogs were originally designed as diaries or personal journals, their data is stored chronologically (newest posts first). A chronological format is ideal

for journaling or reporting news, but is not ideal for communicating knowledge (the newest knowledge may not be the most relevant) (Wagner, 2004). Wiki pages, on the other hand, are rarely organized chronologically; instead they are organized by context, categories or concepts emerging from the authoring process (Lamb, 2004). A third and final functional difference between the two is in the intended use of the technology. A blog is typically authored by an individual (Engstrom and Jewett, 2005). Blogs were conceived as an individual user technology, and as such, are an individual broadcasting technology, operating in one-to-many mode (Wagner, 2004). According to Wagner, this communication pattern is, "well suited for a single expert who wishes to share his or her knowledge with a community, but less so for communal knowledge creation. Swisher (2004) portrays the same sentiment by stating, "if the blog is a soloist, a wiki is an orchestra". Godwin-Jones (2003) agrees calling blogs 'highly personal' and wikis 'intensely collaborative'.

The reality is that an organization should not rely solely on either wikis or blogs as a communication channel or knowledge management system. Employees should be trained in both technologies and decide for themselves how they want to communicate or share knowledge. Both wikis and blogs have distinct advantages depending on their use. At the same time, an organization does not want to deal with diluted technologies with no real way of amalgamating data. An optimal solution may be that of a content management system that contains a wiki and a blog as well as other modules which can be used in assisting collaboration (i.e. discussion forums, whiteboards, instant messaging, email, and SMS). Another option is choosing a wiki or blog software package which resembles and has similar features (modules) to that of a content management system.

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Appendix

Principle	Explanation
Open	If a page is found to be incomplete or poorly organized, any reader can edit it as he/she sees fit.
Incremental	Pages can cite other pages, *including pages that have not been written yet*.
Organic	The structure and text content of the site is open to editing and evolution.
Mundane	A small number of (irregular) text conventions will provide access to the most useful (but limited) page markup.
Universal	The mechanisms of editing and organizing are the same as those of writing so that any writer is automatically an editor and organizer.
Overt	The formatted (and printed) output will suggest the input required to reproduce it. (E.g., location of the page.)
Unified	Page names will be drawn from a flat space so that no additional context is required to interpret them.
Precise	Pages will be titled with sufficient precision to avoid most name clashes, typically by forming noun phrases.
Tolerant	Interpretable (even if undesirable) behavior is preferred to error messages.
Observable	Activity within the site can be watched and reviewed by any other visitor to the site.
Convergent	Duplication can be discouraged or removed by finding and citing similar or related content.

Table 2: Summary of Cunningham's Wiki Design Principles
(As summarized by Wagner, C, 2004)

Organization	Wiki Application	Author Referenced
Linux team at iMagicTV (UK) Ltd	fast information capture tool, as a parallel to the existing formal documentation system	Wiki, 2006
Stellent, Inc.	update its Universal Content Management application allowing businesses to build their own internal "wikis" atop a Web-based content management platform	Ybanez-Delid, 2006
iUpload	Update its Enterprise Blogging Suite connecting "wiki" and blogging software to compliance, workftow, and other content-management processes	Ybanez-Delid, 2006
Petro-Canada	transfer hard-to-search blog entries and comments into indexed "wiki" articles	Ybanez-Delid, 2006

Aperture Technologies Inc.	brainstorm, track projects, write and edit documentation, and coordinate marketing eliminating countless meetings, conference calls, and back-and-forth e-mails	Hof, 2004
The University of British Columbia	build reference lists and outlines, brainstorm instructional strategies, and capture suggestions, store and organize content for a major new job posting and career development web site, share and collaborate on research and conferences	Lamb, 2004
The South Carolina Library Association (SCLA) Governance	archive of association annual reports, newsletters, and other documents in Adobe PDF, Microsoft Word, and Wiki page formats	Chawner and Lewis, 2006
Dresdner Kleinwort Wasserstein	improve communications, collaboration and publication of key information, managing meetings, brainstorming, creating presentations	SocialText, 2006
Nokia	alternative to Email, update the shared repository, checking a group's progress	SocialText, 2006
USC Annenberg Center for Communication	support research projects as well as day-to-day staff functions	SocialText, 2006
Ziff Davis Media	project management, alternative to email	SocialText, 2006
Stata Labs	alternative/supplement to conference calls	SocialText, 2006
Kodak	coordinating a development team	SocialText, 2006
Soar Technology	shared engineering notebook, brainstorming	SocialText, 2006

Institute for the Future	facilitate a workshop, workspace to support collaborative learning in consulting engagements with Fortune 500 executives	SocialText, 2006
Zipp/Composite Tech	informal corporate memory: central repository for information that formerly was shared only in an ad hoc way through e-mail or face-to-face encounters	SocialText, 2006
Global Design Consultancy	Sales, proposal development	SocialText, 2006

Table 11: Existing Enterprise Wiki Applications

Organization	Wiki Application	Author Referenced
Kryptonite	Customer Relationship management: consumer complaints and product vulnerabilities	Juiceenewsdaily.com, 2005
General Motors (GM) FastLane Blog	Discussion about new GM cars and the car market in an often reflective manner	Dearstyne, 2005
Accenture	Filter blogs and personal journals	Dearstyne, 2005
IBM	Share opinions, stimulate discussion, garner ideas, provide insights into IBM's strategies, and, to some degree, promote IBM leadership	Dearstyne, 2005
Sun Microsystems	With more than 1000 bloggers at sun they have discussions of how Sun views its competitors, the usability of software, social responsibilities of high tech companies, and the future of computing	Dearstyne, 2005
OutsellNow	analyzes breaking events and trends affecting the information industry, particularly publishers, commercial information providers, and content software vendors.	Dearstyne, 2005

Microsoft Corp	Aside from personal opinions, Microsoft executives and employees have discussion of industry trends, new products and plans, other technology firms, books, articles, and conference and enterprise presentations	Dearstyne, 2005
State of Utah/Chief Information Officer	Posted information for state agencies and the public on IT planning, web services, managing IT assets, IT's role in homeland defense, and other issues	Dearstyne, 2005

Table 20: Existing Enterprise Blog Applications

Comparison of URL lookups for Bloglines, Blogpulse, Feedster, Pubsub and Technorati (by Mary Hodder, Napsterization)

Service	Information source[1] and method	Information they pull in: Post or Posts and Blogroll	Inbound link counts[2]	Inbound site or source counts[3]	Duration those links stay in count	Has links to one's own blog included	Duplicate posts show in link lookup results for Napsterization[4]	# of links and sources for Napsterization	Provide watchlist or alert to new inbound links for URL	Provides Link Rank for Blog based upon inbound links	Information Philosophy
Bloglines	RSS feeds and spider for html	Posts and blogroll	Yes	No	Forever	Yes	Yes (there were three of one post, two each of another)	1012 links	No	No	Has information going back to the beginning of their service. Also, only has blogs that are subscribed to by at least one person in a Bloglines newsreader.
Blogpulse	RSS feeds and spider for html	Just posts (they throw out blogroll data)	Yes	No	6 months	No	Yes, 2 of one post on the second page.	477 links on URL search, but profile notes 44 citations[5]	Yes	Yes	Keeps information for 6 months.
Feedster	RSS feeds	Just posts or portion of post going through RSS feed	Yes	No	Unknown	No	Yes (there were two of one post on page one)	7 for nap/stories 351 for napsterization. org	Yes	No	Feedster had URL information going back to March of this year for napsterization.
Pubsub	RSS feeds	Just posts or portion of post going through RSS feed	Yes	Yes	30 days	No	No – though it's hard to prove because they just show link counts	76 links from 61 sources	Yes - Pubsub is really set up to provide subscriptions for searches	No	Pubsub does not keep historical information for search, but it does keep link rank data.
Technorati	RSS feeds and spider for html	Posts and blogroll, but ONLY data on front of blog is in link counts[6]	Yes	Yes	While on front page of a blog	No	Yes (the first page of results showed 7 dups of one post; 2 of another for nap.org/stories)	271 links from 205 sites	Yes	Yes	Technorati sees the aging of information as a function of the front of a blog: if information is not on the front page, the information is 'old' and therefore falls out of Technorati link counts and url lookups.

Table 23: Comparison of URL Lookups for Bloglines, Blogpulse, Feedster, Pubsub and Napsterization (Hodder, 2005)

Blog Software	Description	Cost
Blogger	Blogger is a free, hosted blogging tool. It's one of the oldest blogging tools around and today has millions of users. This tool is about the simplest one around, and though free, nonetheless has an impressive array of features. The biggest hole in Blogger's offerings is the lack of post categorization, followed closely by the need to know HTML and Cascading Style Sheets to make custom changes to the templates provided. Blogger doesn't make customization easy, though it does provide some attractive skins to choose from.	Free

Blogger	Interesting features include integration with the Audioblogger a program that allows you to put audio recordings on your blog quickly by simply calling the number and recording yourself. Blogger does allow you to FTP the files generated for your blog to your own Web site. Used together with customization of the Blogger template, this fairly unique functionality means that your readers may never realize that you are using Blogger Blogger is perfect for the future blogger who's in a hurry and less than interested in design customization, but very few professional Bloggers stick with Blogger for very long, if they even start there	Free
Typepad	Typepad is one of Six Apart's hosted half blogging software services and one that has proved very popular with journalistic blogging efforts. The Typepad pricing scheme and features are divided into three levels: Basic, Plus, and Pro Design. Customization is extremely limited at the Basic level and only fully accessible at the Pro level if you want to make a group blog, or give some people editor access and others publishing access. Typepad employs Typelists that allows you to build lists, associating each item with a URL Typepad is a good option for users who want to get started quickly but still want all the bells and whistles. Customization is possible, but complicated, so it's also a good option for those who just want a blog that works without fussing too much over how it looks.	$4.95 - $14.95 monthly, depending on level of service chosen
Blogware	Blogware a robust system with a great selection of the top blogging tools. Blogware, like Typepad, can be difficult to customize, even for an experienced HTML jockey. However, it also provides a fair number of options within the administration interface to let you set up layouts and styles without getting into the templates. A Blogware blog must be vought through a reseller, so prices and packages will vary. It's a good idea to shop around to get the best package for your needs. A good reseller to start with is Blog Harbor. If you're looking to create a blog that has a few non-blog pages, this software is especially helpful.	Varies by reseller but expect to pay from $8-$ 15 a month

WordPress	WordPress is a solid, powerful blogging system ideal for publishers who are on a budget but who don't want to give up any functionality. Each WordPress post is formatted with search engine friendly URLs that also look good to humans. Comments can be extensively moderated: you can review them before they go live. You can also filter comments containing certain words or more than a certain number of links. WordPress's built-in blogroll management tool allows you to categorize blogs, set criteria for the display order of the links, and turn off and on visibility. You can also import an existing blogrolls from some link manager services.This software has inspired numerous developers to write plugins and extra features for use with WordPress, which makes plugin installation a quick and painless affair. Wordpress includes additional themes (or skins), photo galleries, a music player, an event calendar, and even geo mapping.	Free
Movable Type	Movable Type is the best known of all blogging software tools the system is powerful, but not simple to install or use. As a blogging tool alone, Movable Type has nearly every feature you might desire, and continues to add more. Many of their users are highly technical themselves, and have created additional plug-ins that can be added to the standard installation The least attractive functionality of Movable Type is the need to rebuild the blog whenever you make a change to a template, a configuration setting, or add a new category. Waiting for the rebuild is annoying. For the non-technically inclined, installation of this software can be quite a challenge.	MT's pricing scheme is fairly complex. Personal users will pay at least $69.95. Commercial users pay at least $199.95 but there is a free version of the software that you can download and install

Table 24: Summary of Gardner's Blog Software Comparison (2005)