Knowledge Management Systems Research Paper:

Knowledge Management Systems and Web 2.0 Tools & Technologies

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Introduction

Over the years we have seen a tendency for Knowledge Management systems to be reductively defined as technology that simply moves data and documents around. When in fact, the theory is that a Knowledge Management system should be able to “capture, store and distribute structured knowledge that exists in human a head and paper documents”, (Davenport and Prusak, 2001, p. 129) while also meeting the challenges of providing technology that is easy to use, flexible, widely accessible and culturally acceptable.

Currently there is a movement catching a lot of momentum regarding the so-called versioning of the internet from Web 1.0 to Web 2.0. Many feel Web 2.0, is hype or the latest buzzword. In truth, if we did try to version the web, we may find ourselves at Web 37.0. For the purpose of this paper, we are not going to spend time defining Web 2.0 but instead discuss how the current technologies and tools being created may benefit Knowledge Management.

What is Web 2.0?

The “first generation” of the Internet, Web 1.0, focused on the technology and created such tools as email, discussion forums and chat. While Web 1.0 technologies and tools are far from disappearing, we are now at the forefront of Web 2.0 and a change in focus (Goodwin-Jones, 2003). The focus of Web 2.0 is instead on the behavior of the user. It is
about empowering people to communicate and collaborate while at the same time contribute and participate. The term was coined over a year ago by O'Reilly Media [1] Vice President Dale Dougherty during a conference planning brainstorming session. Here is a compact definition by Tim O’Reilly:

“Web 2.0 is the network as platform, spanning all connected devices; Web 2.0 applications are those that make the most of the intrinsic advantages of that platform: delivering software as a continually-updated service that gets better the more people use it, consuming and remixing data from multiple sources, including individual users, while providing their own data and services in a form that allows remixing by others, creating network effects through an ‘architecture of participation,’ and going beyond the page metaphor of Web 1.0 to deliver rich user experiences” (O'Reilly).

The brainstorming session created a list of applications or approaches and identified each as either Web 1.0 or Web 2.0 (see Figure 1).
These applications or approaches embody the principles of Web 2.0 as stated in the compact definition by Tim O'Reilly above. For example, one key principle of Web 2.0 is that of an “architecture of participation”. For this principle let us discuss the photo management tools Ofoto [2] and Flickr [3]. The difference lies in the focus of functionality be offered. Ofoto, a Web 1.0 tool, allows it users to upload and manage their personal photos online. While Flickr, a Web 2.0 tool, builds off of that model and allows for uploading and management of personal photos along with the added functionality of tagging and publishing to provide for collaboration, contribution, participation and knowledge sharing between users.

Another principle of Web 2.0 is that an application or service automatically “gets better” as more people use it. BitTorrent [4],
demonstrates this principle by approaching internet decentralization and participation in a new way. With BitTorrent, a user can publish large music or video files, software, games, etc. to share with others. And because each user is both a client and a serve, there are less bandwidth problems regardless of the popularity of the file. The “key to scaleable and robust distribution is cooperation” (BitTorrent).

Web 2.0 Tools and Technologies as Knowledge Management Systems

Web 2.0 tools and technologies such as Wikis, Blogs, AJAX, RSS and XML are believed to “provide a ubiquitous medium for seamlessly integrating distributed applications, formats, and content, making it well suited for Knowledge Management” (Tiwana, 2001). But as mentioned, Knowledge Management systems ought to also be easy to use, flexible, widely accessible and culturally acceptable.

A Knowledge Management system must be easy to use and to capture the knowledge from within an organization in addition from its knowledge workers. After all, “it is the value added by people – context, experience, and interpretation – that transforms information into knowledge” (Davenport and Prusak, 2000, p. 129). A Knowledge Management system should also provide minimal disruption to the knowledge worker’s normal day-to-day activities while giving them the functionality to impute a significant level of detail to create useful
knowledge for sharing and collaborating as opposed to producing mere data or information.

Another imperative is to provide a flexible data model for knowledge workers who may want to capture email, web pages, documents, text fragments, and images. (Cayzer, 2004). Web 2.0 is being thought of as a possibly the first set of tools and technology to become a “ubiquitous binding medium for integrating distributed applications, formats and contents” (Tiwana, 2001).

**Wikis.** A wiki is a website that allows users to not only create and add content, but also edit content. It provides a more effective way of information exchange through collaborative effort. “A defining characteristic of wiki technology is the ease with which pages can be created and updated” (Goodwin-Jones, 2003). An example from the O’Reilly brainstorming session discussed Content Management systems (see Figure 1 ). They felt that Content Management systems “are generally very robust and not interoperable while wikis allow for constant collaboration, knowledge sharing easily and efficiently” (O’Reilly).

A Knowledge Management system would benefit from wiki technology due to its:

- Ease of use
- Ability to capture knowledge in a shared, growing repository
- Wide accessibility options (via a web browser)
Wikis also provide for flexibility in decentralized organizations by giving the knowledge workers the tools to react quickly to changing situations (Goodwin-Jones, 2003). The most recognized wiki being used today to manage knowledge is Wikipedia [5]. A user who wants to participate simply creates an account, searches the encyclopedia for a topic of interest which they may then edit, add links, upload documents, etc. All of which allows tacit knowledge to become sharable knowledge (see Figure 2).

Figure 2
**Blogs.** “The collaborative environment which has sparked the most intense interest in recent years are blogs” (Goodwin-Jones, 2003). Most blogs are more than just online-journals, they are interactive while being structured knowledge repositories. Blogs offers a set of tools for users to post comments and share their knowledge with other readers. And because of the structured nature of blogs, the knowledge that is captured is easily found and remixed by other users. In the book “The Power of Many”, Christian Crumlish states that blogs “can be used internally as knowledge logs or project logs for employees, volunteers, directors, and even board members” (2004, p.77).

**RSS and XML.** Two of the underlying technologies of Web 2.0 are RSS [6] and XML [7]. RSS stands for Really Simple Syndication and is an expansion of XML, developed by Netscape. XML, Extensible Markup Language is a machine-readable form of markup intended to facilitate data interchange over the internet. As a part of Web 2.0, RSS and XML have been further defined and developed as to provide technology to create both highly structured and machine readable information. This allows for findability and “just in time” knowledge retrieval. Mostly, online information sources use RSS to alert users to new postings, as well as to help sort information coming from multiple sources.
A very recent example is from Yahoo who has just announced their Yahoo Mail beta [8] which includes an embedded RSS Reader. This is a great example of Web 2.0 tools and technology (RSS) building upon Web 1.0 (email). In Figure 3 you see a rough image from the demo (not live as of this paper). The added functionality treats a post from any feed exactly like an email. The posts can be sent via an email message. Using AJAX, posts can also simply be dragged into a folder and saved.
**AJAX.** According to Jessie James Garret of Adaptive Path, AJAX, short for ‘Asynchronous JavaScript + XML’, combines various technologies to eliminate the start-stop-start-stop nature users are accustom to when interacting with web-based applications. Ajax “allows the user’s interaction with the application to happen asynchronously — independent of communication with the server. So the user is never staring at a blank browser window and an hourglass icon, waiting around for the server to do something” (2005).

Google has been leading the way with its many AJAX applications. One of Google’s beta applications, Google Groups [9] (Figure 4), provides a free service to help groups of people efficiently and effective coordinate and communicate using email and the web. The latest version
“builds on the success of the original” (Google Groups) This clearly exemplifies the Web 2.0 principle of delivering software as a continually-updated service.

Another leader in the Web 2.0 movement using AJAX is 37 Signals [10]. One of their Knowledge Management products, Backpack [11], provides a “blank slate that offers you less structure and more space. Backpack adjusts to organizing information your way“ (Backpack).

In Figure 5 we see an example how by simply allowing multiple knowledge workers access to a ‘memo’ about an upcoming meeting allows for sharing and access of both explicit and tacit knowledge such as:
1. Important scheduling information

2. Shared and easily modifiable check list of things to do

3. Personal knowledge and experience of prior dealings with clients

4. Identification of files necessary for the meeting

5. Repository for other tacit knowledge
## Atlanta Chemco Meeting

**4/10/2003 09:30**

The executive team at Chemco is looking forward to our meeting on the 20th.

**NOTE**: Contact Stacey at reception at least one hour before meeting time.

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**Notes**

### Executive Bios

**Tom Stark, President**

Tom has long had an eye toward manufacturing and owning his own company. Tom bought Chemco in 1998. At that time, Chemco manufactured a variety of household products for private label. There was only one SKU, the liquid spot remover, which has a 100 year history.

**Ray Yona, Project Manager**

Ray is the brain behind the development of Chemco’s new product innovations. Ray’s responsibilities extend to include contract manufacturing, procurement and logistics. Ray will likely be our most active, ongoing contact for this project.

**Files**

- Chemco Proposal Draft.pdf
- Capabilities Review Slides.ppt

**Images**

- [Image 1](#)
- [Image 2](#)

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**Figure 5**
Decentralization

Tom Malone asked in 1999, "is empowerment a fad? Or is there something fundamental changing that makes more decentralized control in organizations increasingly desirable?" (Malone, 1999) The concept of ‘empowering’ people does not only apply to the tools and technologies but also to how organizations structure themselves.

There are two main reasons why decentralization is attractive; declining communication costs and freedom. First, the declining costs of communication “make it cheap and easy for lots of people in an organization to get lots of information quickly and without distortion” (Malone, 2004, p. 34). With the interoperability of Web 2.0 tools and technology, this is a perfect time for more decentralization. Second, when a knowledge worker feels they have more freedom and control over their work and decision making, they become more motivated, innovative and responsible for their work. For example, many Web 2.0 applications (blogs and wikis) offer people the opportunity to publish and share their knowledge. “Self-publishing encourage ownership and responsibility” (Goodwin-Jones). The flexibility of a more decentralized organization also encourages motivation and creativity by allowing many minds to work simultaneously on the same project such as with the 37 Signal's Backpack example.
Many organizations now find their information in a variety of locations and stored in a variety of formats, it is important to provide tools to handle this shift from “command-and-control to coordinate-and cultivate” (Malone, 2004, p. 11). Web 2.0 provides distributed knowledge workers the tools to add value and enriching data and information using different platforms, technologies and/or tools.

One challenge that is often over looked has to do with the organizational culture. Often, “management”, will put a set of tools, a database or repository, in the center and the people are placed around it for support. When this happens, any context is lost and the system will ultimately fail. The future of Web 2.0 Knowledge Management systems should instead put empowering the people at the center and remember that while Knowledge Management systems are “often facilitated by technology, technology by itself is not Knowledge Management” (Santosus, 2005). Knowledge Management is people.

Conclusion

In Rudy Ruggles paper, “The State of the Notion: Knowledge Management in Practice” he states that “ironically it may be that only after the technological capability exists that many companies realize how vital the people factor are” (1998). While he was referring to the early
adopters of Knowledge Management it can also apply to the adoption of Web 2.0. Because Web 2.0 is still developing, it will most likely go through a process of natural selection. There is no way to predict what ‘version’ of the Web we will have next year or what tools and technologies will be available for Knowledge Management. There is much further research and discussion to be had. Meanwhile we are seeing the embodiment of the World Wide Web: ordinary people, feeling empowered, using technology to create, collaborate, share and participate with others and the world.
References


TechCrunch. Retrieved November 29, 2005 from


Notes
[2] Ofoto. Kodak EasyShare Gallery (www.kodakgallery.com), formerly known as "Ofoto", is the leading online digital photo developing service. For more information see: http://www.kodakgallery.com/AboutUs.jsp?
[6] RSS. Really Simple Syndication. For more information see:
http://realllysimplesyndication.com
[7] XML. Extensible Markup Language. For more information see:
http://www.w3.org/TR/REC-xml

[8] Yahoo Mail Beta. For more information see:


[10] 37 Signals. This company was founded in Chicago in 1999 by Jason Fried and creates remains a privately held company to this day. For more information see: http://www.37signals.com/

[11] Backpack. Backpack is a Web 2.0 Knowledge Management system created by 37 Signals [8]. For more information see:
http://www.backpackit.com/