Görüşler / Opinion Papers

Can Web 2.0 be Used Effectively Inside Organisations?

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Abstract

There is a common conception amongst higher and middle management that facilities that are "good for the Internet" can be transferred for application to the enterprise intranet. The latest fashion to arrive on the information scene is the Web 2.0 phenomenon, a range of tools including blogs, Wikis and RSS. This paper presents a brief overview of the Web 2.0 phenomenon and some tentative views on the relationship between Web 2.0 tools and the more formal and traditional tools used in information handling. The paper concludes that whereas Web 2.0 facilities will grow and develop on the Internet, the use of Web 2.0 facilities within the enterprise should be carefully planned as adjuncts to existing facilities, not as substitutes.

Can Web 2.0 be Defined?

Judging by the comments made in the national and trade press, and on the Internet, the answer is probably no, but that there is a radical phenomenon growing rapidly on the Internet can not be disregarded. What is common to all the manifestations of Web 2.0 – the blogs, wikis, mash-ups and shared facilities, and shared repositories supported by folksonomies – is the explosive "democratization" of the World Wide Web where, in principle, everybody can communicate with everybody and contribute to shared spaces. But Tim Berners-Lee (known as the Father of the Web) sees nothing new in that: "If Web 2.0 for you is blogs and wikis, then that is people to people. But that was what the web was supposed to be all along" (Anderson, 2006). But Berners-Lee also points

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to the dark side of this movement, when he says that blogging is one of the biggest perils facing the web in that "there is a great danger that [the web] becomes a place where untruths start to spread more than truths" (Johnson, 2006).

The origin of the expression Web 2.0 has been claimed by Tim O'Reilly (2005), the CEO of O'Reilly Media, as coming out of a conference brainstorming session between himself and MediaLive International. This produced an article in which O'Reilly tried to clarify just what was meant by the expression Web 2.0. Though much of what he said concerned commercial aspects of less interest to this paper, there were some interesting pointers to what was happening on the Internet. O'Reilly enunciated seven principles:

1. *The Web as Platform:* The scene had changed from the Netscape era to that now dominated by Google. Whereas Netscape had "framed the 'web as platform' in terms of the old software paradigm, their flagship product [being] the web browser, a desktop application", Google "began its life as a native web application, never sold or packaged, but delivered as a service". In other words, he said, "Google happens in the space between browser and search engine and destination content server, as an enabler or middleman between the user and his or her online experience."

2. *Harnessing Collective Intelligence:* Yahoo! and Amazon have been pioneers in the move towards bringing the users into a shared space.
3. *Who Owns The Data?* This is the big question: who owns the data, and what do they choose to do with it? This will continue to be, for some time to come, a commercial battlefield.

4. *End of the Software Release Cycle:* If software will be delivered as a service rather than as a product, it must be maintained on a daily basis, which puts an enormous pressure on the service provider. O'Reilly claims that this new paradigm leads to the need to treat users as co-developers, and where some sites are in an almost "perpetual beta" condition.

5. *Lightweight Programming Modules:* The previous principle suggests that programming models should allow for loosely coupled systems, allowing syndication rather than mere coordination.

6. *Software Above The Level of a Single Device:* Again following on from the software principles above, the need is perceived for Web 2.0 software to be capable of running on any device, particularly in the fast emerging era of mobile computing.

7. *Rich User Experiences:* And last, but by no means least, perhaps a hope rather than a principle, the golden prize of user satisfaction.

But not everybody is so impressed. Jack Schofield, the IT Correspondent for the British daily newspaper, *The Guardian* is one such person, and quotes an American, Joel Spolsky, CEO of Fog Creek Software as saying "The term Web 2.0 particularly bugs me. It's not a real concept. It has no meaning. It's a big, vague, nebulous cloud of pure architectural nothingness"(Schofield, 2005).

Components of Web 2.0

From the user perspective the major components of Web 2.0 are those incorporating social interaction, including:
➢   Blogs
➢   Wikis
➢   Bookmarking and Tagging, using Folksonomies
➢   RSS (enabling Mash-ups)
…and a growing range of actual web-based facilities.

Blogs

A simple definition of a blog is "A web log: an online diary or frequently updated personal web page" (BlogsCanada.ca, 2003). One journalist (Longbottom, 2006) has claimed that 75,000 new blogs are being created every day, while Christopher Barger, the IBM Blogger-in-Chief has said in an interview, (Owen, 2006) that "the number of blogs – not the number of active or good ones – doubles every five months, and where there were less than 2 million in 2003, there are now more than 32 million [as at mid-2006]". Barger goes on to suggest that "One per cent of them might be worth the screen that they're written on". Two common failings are that they are infrequently updated and that the entries are chronological, rendering them difficult to use retrospectively.

Where blogs started as being almost entirely personal, five types have now evolved (Gotta, 2004):

➢   Internal blogs (targeted to employees only)
➢   External blogs (focused on the general public)

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➢   Thematic blogs (linked to a particular event or project)
➢   Sponsored blogs (posted by an employee, authorised but not necessarily endorsed by, the company
➢   Personal blogs

It is clear from this list that organizations are beginning to adopt this technology.

Wikis

The word Wiki is taken from the Wiki Wiki bus service at Honolulu Airport, and means double quick. In Web terms "it is a type of website that allows users to add, remove, or otherwise edit all content, very quickly and easily, sometimes without the need for registration" (Wikipedia, 2007a).

Perhaps the most famous Wiki is the Wikipedia (2007a), and its short history is illuminating in the debate on Web 2.0 artefacts. The Wikipedia allows, with some screening (by 400 online volunteers), anybody to contribute and/or edit entries in its online encyclopaedia now containing 1.5 million articles. As has been widely reported, [for example (Orlowski, 2006; Wikipedia, 2007b) (the latter reference from the Wikipedia itself)], the renowned scientific journal *Nature* reported that of the 41 science articles it reviewed, there were 162 mistakes in Wikipedia versus 123 for Britannica. The details of this survey have been hotly disputed by Britannica which is conscious of its vulnerability in the age of electronic media, but *Nature* has refused to retract its findings. However, some of the criticisms of Wikipedia have been sufficiently telling for Larry Sanger, one of the co-founders of Wikipedia to announce that he has plans for a new online service, which he calls the "Citizendium", "a Wikipedia written by experts" (Moddy, 2006). But Wikipedia also has ambitious plans as co-founder Jimmy Wales said in a recent interview (Marks, 2007) when he announced that he had plans to collaboratively develop a search engine which would be entirely transparent, in that it would not include algorithms that produced biased results for commercial advantage.

A problem with corporate Wikis, noted by one journalist is that meetings she has attended have finished with the words "O.K., let's continue this discussion on the Wiki", only to discover months later that nobody has. This journalist suggests that Wikis "need a critical mass of

people who regularly edit them in order to produce a functional document" (Hogge, 2006).

Folksonomies

The term Folksonomies was coined by information architect Thomas Vander Wal. The Wikipedia (2007c) definition is "an Internet-based information retrieval methodology consisting of collaboratively generated, open-ended labels that categorize content such as Web pages, online photographs, and Web links". This is possibly the most contentious aspect of Web 2.0 techniques, as it appears to run counter to the fundamental beliefs of librarians and information scientists, while having an enormous appeal to the far wider public.

Vander Wal has said on a members-only discussion list (IAI members discussion list) that folksonomies have three elements that must be as clear as possible:

➢ The object being tagged: and Vander Wal notes that much blog tagging fails because it is never clear if it is the blog post being tagged, the objects being written about, or something in between
➢ The tag itself
➢ An identity

He adds that folksonomy must also be done through free tagging and not from controlled vocabularies. Studies are beginning to be undertaken of tagging, for example one by researchers at the Hewlett Packard Laboratories (Golder and Huberman, 2006). The authors conclude that "The prevalence of tagging with a very large number of tags and according to information intrinsic to the tagger demonstrates that a significant amount of tagging, if not all, is done for personal use rather than public benefit".

Miscellaneous Facilities

➢ RSS, variously spelt out as Really Simple Syndication, Rich Site Summary, and RDF Site Summary, is "a family of web feed formats, specified in XML and used for web syndication" (Wikipedia, 2007d). Aggregators are then used to allow a website's frequent readers to track updates on the site (Wikipedia, 2007e).

➢ RSS allows for another device called Mashups "a website or web application that uses content from more than one source to create a completely new service" (Wikipedia, 2007f). Google has fed into

this growth area with its Googlemaps, used for example by the police force in Chicago to put a map of the city on the Web showing at street level where crimes have been committed.

➢ Podcasting is "the method of distributing multimedia files, such as audio or video programmes over the Internet using syndication feeds" (Wikipedia, 2007g)..

➢ Ajax (shorthand for Asynchronous JavaScript and XML) is "a web development technique for creating interactive web applications" (Kynin, n.d.)

And finally, Bradley (2006) has written about families of new Web 2.0 facilities including:

➢ Online calendars (updated by RSS feeds)
➢ Personalized search engines (with personal profiles of interests and websites)
➢ Collaborative word processors.

Doubtless there will be many, many more innovations in the years to come.

Using Web 2.0 Components in the Enterprise

There are very few formal reports concerning the take-up of Web 2.0 facilities by organisations. The one enterprise that comes up most often as having implemented Web 2.0 facilities is the European investment bank Dresdner Kleinwort Wasserstein (the Wasserstein has recently been dropped). It has been claimed by its chief architect J.P. Rangaswami that the bank "started with Wikis in 1995 and blogs in 2002 (Burton, 2006). The two initiatives were merged to make them easier to manage in 2004." Other accounts of experience are somewhat slow to appear though a few are available (Millen, 2005; Dodds, 2006 ve Wood, 2006). The first of these papers reports on a research prototype of social bookmarking at IBM. Three additional techniques are being investigated: the first being "extension" whereby the evidence gleaned from individual tagging is used to infer the possible interest of the tagger in associated material (as pioneered on a large scale by Amazon), the second is to integrate an individual's bookmarks with other information sources provided by that individual, and the third would be to place bookmark collections from a group of individuals into Web sites maintained for various teams or projects. Fred Killeen, GM's chief systems and technology officer has been reported as being keen to use Web 2.0 for

collaborative working, including internally managed Wikis to support meetings with relevant material and definitions for terminology used, as well as folksonomies, which Killeen sees as avoiding the expense of creating formal taxonomies (Saran, 2006).. It is not clear from the brief report how he was able, if at all, to make an objective comparison between the two in terms of effectiveness and efficiency in searching.

While most of the reports of the use of Web 2.0 facilities have appeared in the trade press, even fewer accounts have appeared in academic journals. One such is a largely enthusiastic account by Andrew McAfee (2006), writing in the *MIT Sloan Management Review*. He notes that "The technologists of what he calls Enterprise 2.0 are trying not to impose preconceived notions about how work should be categorized or structured. Instead, they're building tools that let these aspects emerge". He goes on to suggest six components with the acronym SLATES, as follows:

Search: From studies of use of search engines McAfee infers that intranets are lagging behind the Internet in their effectiveness in searching, but these comparisons are almost certainly invalid because of different user groups and almost certainly different search needs. There is a big difference between looking for mission-critical information on an intranet and train times on the Internet

Links: This is where McAfee pays tribute to the advances made by Google in this area. Others have already argued that it is hyperlinking that has made the Internet so attractive.

Authoring: This is, perhaps one of the main Web 2.0 elements, the core aspect of harnessing collective intelligence through blogs and Wikis.

Tags: The second core Web 2.0 element is the folksonomy, and here McAfee envisages the usefulness of employees being able to tag intranet and Internet pages they have visited, see which other employees are using the same tags and what sites they have visited.

Extension: Here McAfee quotes the Amazon example mentioned above.

Signals: This is basically the RSS feed system mentioned earlier in the paper, designed to attack the problem of information overload, and it also has to be said, the relative unreliability of search engines, particularly in a corporate setting.

Where McAfee is enthusiastic, Tebbutt (2006) has written a more cautious article listing the possible barriers to attempting the implementation of a Web 2.0 approach in the enterprise. Tebbutt, in conducting his survey, recognized that companies would be unlikely to go on record with their reasons for rejecting social computing so he talked instead to analysts, consultants and social computing adopters. The results were interesting, and perhaps not surprising. His analysis was presented under five headings:

1. *Losing Control:* This is absolutely fundamental, and turned out to be the dominant concern. Some companies are nervous about giving their employees a voice, and believe that social computing could subvert the hierarchy and that staff would discover things that management would prefer to keep hidden. There is a fear that inviting comment on company policy and procedures could open the floodgates to an unmanageable torrent of poorly informed comment.

2. *Never Trust an Employee*: This is related to the previous concern, and arises from the fact that many companies do not have enough faith in their employees to think that they will use such open systems effectively or worse, will waste time or leak confidential information to the outside world. The author of this paper knows of one multinational where anyone wishing to post material on the company intranet must seek permission from the lawyer attached to his or her department, a process which has been known to take three or four weeks. Tebbutt quotes the Research Director of Forrester as saying that "this lack of trust is due to the fact that senior management is largely made up of alpha males. Being in control is what they're good at and what they like, which is what brought them to the board seat to begin with".

3. *Heard it All Before:* A number of other authors have also commented on this, for example Gotta (2004). One IT Director, quoted by Tebbutt, claimed that "You can't discount the fact that other tools, such as distribution lists, shared folders and eRooms come close in functionality". However, it should also be noted that some of the big vendors of portals and content management systems are beginning to incorporate blog and wiki facilities into their portfolios.

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4. *Rejecting Social Computing:* A standard problem in change management is getting staff to drop old habits and ideas and to adopt new ways of working. The standard question raised when being told of some technological innovation is "What's in it for me?" In addition, the openness of social computing may, to some, be unnerving and the fear of exposure too great.

5. *Hierarchy Anarchy:* Closely related to losing control and the lack of trust in employees comes the fear, particularly in middle management, that staff will bypass the hierarchy and the official channels if it makes life easier – or even more exciting. As social computing becomes entrenched a complementary power network emerges within the organisation. This concern is well summed up by a Chief Information Officer in a debate on corporate blogs: "Blogs are popular because they tend to represent personal opinions and personality rather than corporate messages. Therefore we need to take a great deal of care to ensure appropriate use so we don't devalue the blog concept, whilst avoiding mayhem in what essentially needs to be a controlled message" (McCue, 2006).

Social Computing

Harnessing collective intelligence was one of the Web 2.0 principles put forward by O'Reilly (2005), and there is no doubt that behind all the hype and the commercial interest, Web 2.0 is a "people thing", touted by many as being the "democratisation" of information (and echoed in words like "Folksonomy" and "Citizendium"). Whatever all this might mean, the emphasis is on the word "social", and it is found in many phrases, often used interchangeably, though having slightly different meanings. Social computing, for example, has been defined quite widely as "The interplay between persons, their social behaviours and interactions with computing technologies" (Social Networking), while the more specific. Social networking is "The activity of meeting friends or business contacts through networking services offering blogs, chat, e-mail, instant message and videoconference. The scope includes Web sites that host private or open virtual communities" (Social Networking, n.d.). Covering tagging and folksonomies, social bookmarking is defined as "a web based service, where shared lists of user-created Internet bookmarks are displayed" (Wikipedia, 2007h).

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Gotta (2004) maintains that "Interest in social computing is being driven by the continued extension and virtualization of work, workforces, work associations, and the workplace itself, as well as the blurring of boundaries between work and lifestyle needs". There is an interesting aspect of this, as pointed out by Schofield (2006) when he says that "There is a new generation entering the workforce who was all born after the IBM PC. Most of them have grown up with home computers and games consoles. Most likely they are also familiar with camera phones, IP telephony, instant messaging, blogging, podcasting and using webcams for simple videoconferencing." The effect of this on the enterprise may be significant. Till now, he says "Businesses have tended not to exploit multimedia because the equipment was too expensive and it required too much staff training. Now they have the equipment and they are hiring staff who may already have the skills". This newly found know-how also brings dissatisfaction with what may become outmoded technologies. A good example is e-mail (over 70% of which has been estimated to be spam) and which has been something of a headache for IT departments, managers and users alike. It has been suggested by J.P. Rangaswami, the architect of one of the few Enterprise 2.0 implementations to be written about, that "E-mail is now snailmail, no longer fit for purpose, although it served many glorious purposes for many years" (The e-mail killers, 2006), At least within the enterprise, instant messaging and Wikis could make email obsolete. This possibility is strengthened by a survey undertaken in 2005 by Davenport (2005) who produced figures relating to the use made of e-mail by knowledge workers which showed that:

➢   26% thought it was overused in their organizations
➢   21% felt overwhelmed by it
➢   15% felt that it actually diminished their productivity.

Any alternative that could reduce that degree of dissatisfaction is likely to be rapidly adopted. A further implication of this is that intranets could increasingly become communication channels rather than merely broadcasting mechanisms or databases created by silos.

Paradoxes and Conclusions

General Management and Knowledge Management
The previous two sections were concerned with management issues and with social computing, and these seem to be the most important factors

in considering the possible efficacy of implementing Web 2.0 techniques within the enterprise. It is also clear that some types of enterprise will be more amenable than others.

It may follow then, that there are specific groups within organisations that could derive more benefit than others from social computing, and this is hardly surprising. Relevant here is a paper by Brown and Duguid (2001) in which they say that "New knowledge, vital for growth, frequently emerges from small communities of practice. In other words, research groups often develop a common set of habits, customs, priorities and approaches that both produce new insights and enable them to flow with little attention to how they might be transferred to outsiders" This immediately suggests, and again it is not surprising, that it is communities of practice or communities of interest embedded within organisations which are most likely to be able to use, and profit from, social computing. The authors go on to say "When an organisation reaches a certain stage in its development, instead of developing like a self-organizing string quartet, it becomes more like an orchestra whose disparate sections now need a conductor. At that point, establishing business processes becomes important. Process helps coordinate different communities so that their practices, while allowed to flourish, don't grow out of touch with one another. Ideally, processes must permit rigor without rigidity. The balance is not easy to achieve. Process emphasizes the hierarchical explicit command-and-control side of organization – the structure that gets things done. By contrast, practice emphasizes the implicit coordination and exploration that produces things to do. Practice without process tends to become unmanageable; process without practice results in the loss of creativity needed for sustained innovation."

Informed Leadership and the "Wisdom of the Masses"

One of the arguments put forward by enthusiasts for tagging on Internet sites is that the more people who contribute, the more one is likely to arrive at "the truth". Campbell and Fast (2006) are most explicit about this:

➢   if you get enough people doing what they like – linking, tagging, sharing or subscribing – interesting and useful patterns emerge
➢   these patterns get more useful and more interesting as more people join in to do what they like

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> ➤ systems that exploit these patterns can scale to larger sizes in ways that traditional information systems, such as library catalogues, can not
> ➤ systems with fewer rules and constraints are more likely to obtain widespread adoption and more likely to generate beneficial patterns.

In the context of this paper the words "what they like" and "fewer rules and constraints" stand out.

The point about "enough people" is also important, and a story quoted originally in the journal *Nature* is often alluded to by proponents of tagging. Francis Galton (1907), the British polymath, reported on a small and informal experiment that he conducted at the beginning of the 20th Century. Galton collected 787 participants at a country fair to guess the weight of an ox. The participants were a mixture of farmers, butchers and ordinary bystanders. Galton took the answers and calculated both the median and mean estimates. The median guess was within 0.8% of the correct weight and the mean within 0.01%. It is important to note a number of factors in this interesting experiment. First, the large number of people involved, probably far larger than might subscribe to a corporate blog or Wiki on a particular issue. Second, Galton was concerned with the discovery of a verifiable fact, not an opinion about some abstract issue (and the CIO quoted above was aware that blogs attract personal opinions and personality).

The difference between guessing answers to fact-based questions and opinions about abstract issues is, of course, enormous, and one which becomes most apparent in public referenda on complex issues. The problem is one of organizational *context.* Referring to the quotation in the previous paragraph it is clear that opinions will be welcome in the area of "practice", especially from members of the community. It is less clear that opinions will be welcomed from senior management in the area of "process". An opinion, as expressed by a relatively junior employee, is couched within an individual context, comprising the set of facts and prior opinions available to that individual. That set is likely to be very different from that of a member of the Board. The *consensus* opinion of a majority of employees may send a powerful signal to senior management about the mood of the workforce, but may not always have much objective value in business terms.

Knowledge Management and Information Management

It is a truism to say that management thinking can be subject to fashionable waves as new and exciting ideas emerge, but it would be a mistake to suppose that the new wave replaces the *status quo*. It is unlikely that Web 2.0 will replace Web 1.0; more likely that it will be assimilated into the wide range of Internet facilities, though obviously affecting many aspects of Web 1.0 as it is assimilated. There is probably an even stronger argument to suggest that "Enterprise 2.0" will not replace "Enterprise 1.0". At a lower level, it can be seen that there are many enthusiastic writers who proclaim that formal systems, such as library classifications and website taxonomies are now superseded by tagging and folksonomies, if only on the grounds that taxonomies are expensive to build and maintain. But, as Macgregor and McCullough (2006) point out "It is curious to note that during the period in which collaborative tagging has emerged, a reaffirmation of controlled vocabularies has arisen in parallel. The requirement for improved information organisation and management within the corporate sector has facilitated the increased deployment and development of corporate taxonomies".

If social computing is a tool to support knowledge management, as seems clear, then it will need to continue to be supported by, and integrated with, the more formal methods of information management. The four modes of knowledge conversion suggested by Nonaka and Takeuchi (1985) will still hold, *viz.*

➤   Socialization: From Tacit knowledge to Tacit knowledge
➤   Externalization: From Tacit knowledge to Explicit knowledge
➤   Combination: From Explicit knowledge to Explicit knowledge
➤   Internalization: From Explicit knowledge to Tacit Knowledge.

These conversions must be designed, balanced and integrated.

Information Overload and Technology Overload

The final paradox arises from the fact that new technologies, partly intended to combat information overload may actually contribute to it. Furthermore, unless we are careful they may actually contribute "inferior" information. Baroness Greenfield, addressing the British House of Lords, reported on a study that had given her cause for concern with regard to the education of children, but which has wider implications (UK

Parliament. Publications & Records, 2006). The report showed that a survey of eight to 18 year-olds had found that they were now spending an average of 6 ½ hours a day using electronic media. The report concluded that "Screen culture is a world of constant flux of endless sound bites, quick cuts and half-baked ideas. It is a flow of gossip tidbits, news headlines and floating first impressions. Notions don't stand alone but are massively linked to everything else; truth is not delivered by authors and authorities but is assembled by the audience". If this phenomenon replicates itself in the increasingly fast-moving, competitive and mobile world of business, then there is a danger that there will be little time for reflection and the making of balanced judgements. It will be important to get the balance right in the design and use of the technologies on offer.

The conclusions may be summarised as follows:
➢ There is little doubt that a new wave of technologies, loosely called Web 2.0, has arrived and is likely to remain and to evolve
➢ It does not follow, however, that these technologies are all necessarily appropriate for implementation in all corporate enterprises
➢ It is certainly likely that some of these technologies could be beneficial in certain areas of the enterprise, notably communities
➢ This is, in effect, an extension of Knowledge management principles which are relatively well understood
➢ Any attempt to embrace these technologies too widely, or without careful planning, will be doomed to failure, and likely to be counterproductive
➢ In any case, such technologies and their adoption, should be allowed to evolve naturally rather than be imposed on the workforce.
➢ Replication of facilities already in place that do the same, or similar jobs, should be avoided – users can be easily confused by technological offerings
➢ The possibilities should not, however, be rejected out of hand – there are useful technologies on offer, particularly if they are tailored to specific needs and circumstances
➢ Wherever they are implemented, they should be supported by, and integrated with, the formal information management systems.

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