

DRIVERS AND BARRIERS TO THE ADOPTION OF WEB 2.0

Ashutosh Tiwari¹, Rafael Navarro Fontestad² and Chris J. Turner¹

¹*Decision Engineering Centre, School of Applied Sciences, Cranfield University, Bedfordshire, U.K.*

²*Airbus CIMPA, New Filton House, Golf Course Lane, Filton, Bristol, U.K.*

Keywords: Web 2.0, Business transformation, Knowledge management.

Abstract: Today, information overload and the lack of systems that provide employees with the right knowledge and skills are common challenges that large organisations face. This can lead to knowledge workers re-inventing the wheel due to problems in the retrieval of information from both internal and external sources. Web 2.0 tools aim to address this type of issue facilitating collaboration and knowledge sharing in a corporate setting. This paper describes the benefits and constraints associated with the use of Web 2.0 tools and identifies the drivers behind the adoption of such tools in industry. A number of landscape overview models are presented here that attempt to describe the effect of using Web 2.0 tools on a knowledge based organisation. An organisation, active in the construction industry, is the focus of a case study where Web 2.0 tools are matched to real knowledge sharing and collaboration problems.

1 INTRODUCTION

Implementing knowledge management practices within a large organisation has always been a challenge (Robinson et al., 2005). There are a number of key reasons for this such as the division of work into specialist functions, geographically distributed teams and movement of team members between functions and organisations. This poses a problem for an organisation wishing to capture and share the knowledge of its workforce; and often leads to the need to 're-invent the wheel' when staff with the requisite knowledge are no longer available to the organisation.

The emergence of a new set of web delivered communication and collaboration technologies, branded by some as Web 2.0 technologies (O'Reilly, 2005), has allowed for a reassessment of the viability of IT enabled knowledge management practice within industry. However, despite the clear advantages that 'Enterprise 2.0' can bring, some authors (Hoover, 2007; Wiens, 2007) have expressed concerns about adoption hurdles that Web 2.0 technologies have to overcome. Some of those concerns are security, lack of expertise of the knowledge workers to be familiar with the new tools, integration with legacy technologies, difficulties in providing a measure on Return On Investment (ROI) and reluctance to share information (Daniel, 2007). This paper presents the

work carried out on a project to examine the role Web 2.0 technologies could play in the knowledge management strategies of industry. A case study is presented concerning the re-evaluation of an intranet portal of a large industrial organisation (involved in the construction industry). The drivers and barriers inherent in the adoption of Web 2.0 technologies in industry are identified in this paper along with the key technologies encompassed under the Web 2.0 banner.

2 METHODOLOGICAL APPROACH

In essence a combination of interviews and secondary research was used to deduce the landscape overview models that result from this work. The following phases were undertaken in the completion of this project:-

- **Phase I:** Characterising Web 2.0 – identifying the main technology segments and products that comprise Web 2.0
- **Phase II:** Strengths and weaknesses of Web 2.0 for knowledge sharing – a detailed examination of each of the software products identified from phase I and a study of the current knowledge architecture of the case study organisation, including detailed

discussions with staff members of the organisation

- **Phase III:** Consolidation and recommendations – the collation of the views on Web 2.0 technologies and recommendations on the future technologies that are most likely to be important for the learning organisation

Phase I involved the completion of an extensive literature review in the area of Web 2.0 technologies. The review focussed on the use of Web 2.0 in a corporate setting and also involved the identification of technology areas Web 2.0 products interact with. In total 17 experts (in the field of Web 2.0) were consulted (via their professional blogs) in the completion of this research.

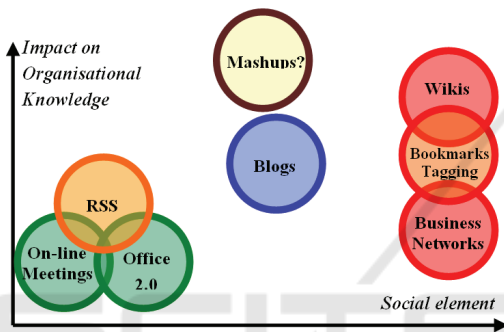


Figure 1: Landscape overview of Web 2.0 technologies representing their impact on organisational knowledge against the social element involved.

A landscape overview was constructed identifying technology segments and products (presented as a pictorial view of segments and products and shown in Figure 1). This was completed with the help of a number of senior managers in a set of brainstorming sessions held at the case study organisation. This information was combined with the findings from secondary published sources and expert opinions (via their professional blogs). The location of the segments in the landscape overview graphs shown in Figure 1 was based on the findings from this phase. A research gap was drawn from this initial stage. In the completion of phase II it was necessary to carry out a new set of interviews and workshop sessions in order to establish the current use of the case study organisation’s intranet portal as a means for knowledge sharing and re-use. An is-is of the current intranet portal was constructed and from this features of the portal were challenged against potential benefits of Web 2.0 technologies (this activity was carried out in a number of workshop sessions completed at the case study organisation,

involving both managers and users of the portal). Each identified Web 2.0 technology was tested and evaluated for its relevance to the case study organisation as part of this research. Phase III brought together the findings of phase I and II and delivered a set of recommendations for the improvement of the intranet portal and an overview of the technologies most likely to impact facilitation of organisation knowledge sharing and re-use in the future. Gap analysis was used to produce a set of factsheets outlining the benefits of Web 2.0 technologies over the case study organisations existing intranet based tools.

3 CHARACTERISING WEB 2.0

As mentioned in the methodology section of this paper a landscape overview was constructed identifying technology segments and products that comprise Web 2.0 (shown in Figure 1). Figure 1 shows the impact on organisational knowledge that each technology sustains if it succeeds in its implementation against the social input required to present reliable results. Figure 2 shows a second landscape overview which details the impact on organisational knowledge over time after deployment of Web 2.0 technologies (the landscape overview in Figure 2 is based on views expressed in papers at the literature review stage and expert opinion). Attention must be given to the shape of the curves and their relative value in Figure 2. The top curve in Figure 2 represents the synergy achieved through a joint implementation (when all of the technologies are implemented simultaneously).

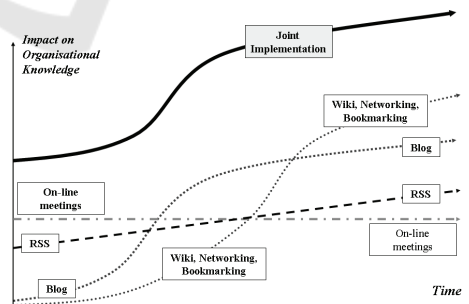


Figure 2: Landscape overview of Web 2.0 technologies representing their impact on organisational knowledge against the time after they have been deployed.

This research has identified the following technology segment classifications relevant to Web 2.0:

- Corporate blogs
- Enterprise wikis

- RSS platforms (Really Simple Syndication)
- Business networks
- Social bookmarking and tagging
- Office 2.0 tools
- On-line meetings
- Enterprise mash-ups

Each of these segments satisfies drivers and presents constraints for an organisation wishing to implement the technologies the segments categorise. An organisation wishing to address strategic drivers in its business must weigh up the following benefits and constraints presented for each segment:

Corporate blogs

Drivers: information dissemination, thought leadership initiatives, community building

Constraints: culture change required

Representative products: Blogger, MovableType, WordPress.

Enterprise wikis

Drivers: bridge gap between knowledge and its development, Consensus building.

Constraints: culture change required

Representative products: Wikipedia, JotSpot, SocialText, Kwiki, Editme.

RSS platforms

Drivers: email overload

Constraints: security, message content

Representative products: Google Reader, Feed Burner, Attensa, Newsgator, Knownow.

Business networks

Drivers: user interaction, time reduction

Constraints: *social rather than business use, employee acceptance*

Representative products: Face book, LinkedIn, Xing BC

Social bookmarking and tagging

Drivers: time reduction in searching

Constraints: security, no standardisation

Representative products: Del.icio.us, Dogear, Cogenz, Connectbeam.

Office 2.0 tools

Drivers: outsourcing of common desktop software

Constraints: security, bandwidth constraints, some features missing

Representative products: GoogleDocs, Zoho, 24SevenOffice.

On-line meetings

Drivers: time savings, cost reduction

Constraints: need still exists for face to face meetings

Representative products: TeamSlide, WebEx, PresenterNet.

Enterprise mashups

Drivers: encourages re-use and recombination

Constraints: no common format, lack of suitably enabled data sources

Representative products: Datamashups, JackBe, AboveAll.

4 INDUSTRIAL CASE STUDY

The industrial case study consisted of a profound review of the organisations intranet in order to discover the areas in which 'Web 2.0' capabilities would provide business benefits in their deployment and use in a corporate setting. The analysis and recommendations were carried out at strategic level.

4.1 Portal 'as-is' Model

The following sections characterised the original portal –

- People – each staff member had their own self maintained profile page.
- Projects – all current and previous project descriptions were available from a set of pages generated from a database.
- Networks – provision of an on-line tool for the user creation of a community of practice.
- Insight – best practices and feedback were recorded on this page, allowing for their retrieval.
- Corporate – contained formal procedures, policies and other corporate content.

4.2 Portal 'to-be' Model

The analysis was focused on delivering a set of identified weaknesses in the portal and a set of recommended solutions based on the potential of 'Web 2.0' and using both enterprise and user focused web-based products. The results are listed by the different 'Web 2.0' segments mentioned in this paper.

News Customisation (RSS News Feeds). In the 'as-is' portal there was limited scope for customisation of the news service. The portal did not allow subscriptions to either particular keywords, specific news (depending on who was posting it), or external news services such as journals, articles databases, etc. It was suggested that the Google RSS reader should be used due to its ability to organise, track and share items based on keywords.

Incorporation of Social Bookmarking and a Tagging Policy. The 'as-is' portal did not allow for

bookmarking. It was recommended that bookmarking should become a feature of the 'to-be' portal. If the results have the capability of showing which other users already have certain key words in their bookmarking lists, it is likely that highlighted users will possess other bookmarks relevant for that search. The Cognez tool was recommended for this task. It was also suggested that a policy should be introduced for the tagging of discussion forum threads.

Personal Network Capability. The 'as-is' portal neglected to display the links between users of the personal network facility. It was recommended that a Social Network Analysis (SNA) tool should be used to discover network hubs and key people inside the organisation based on their network use.

Use of Wikis for Group Document Authorship. It was recommended that the organisation should use a wiki for the group authoring of documents such as best practice guides where experts could add and review document contents in an interactive fashion. It was also recommended that this authoring method could also be used for more formal documents. Such documents require a final quality review by definition, but group authorship through wiki technology provides added value in a number of cases:-

- Best practice documents elaborated between colleagues in the same 'skills network'
- Technical documentation, user-case for customer relationship management, project life-cycle management among colleagues in the same project team
- Job profile description developed among colleagues from different departments possibly located in different offices
- Contract development between the case study organisation and its supply chain partners
- Project requirements, specifications, contract details etc. which may be developed in collaboration between the case study organisation and its customers
- White papers, strategic discussions, etc. between the case study organisation and its partners

Improvements on Email Management. It was identified that employees in the case study organisation experienced email overload. This problem was seen as key, by the case study organisation, creating difficulties in their collaboration and communication processes.

Certainly the use of technologies such as RSS and wikis (mentioned earlier in this section) can be used to divert and manage a large amount of email traffic. To address this it was suggested that the organisation could utilise a social networking platform, such as Face book to organise and filter a large proportion of the email communication.

Limitations. It must be noted that there were a few limitations encountered in the implementation of these recommendations at the case study organisation. For security purposes the case study organisation limited the online methods for communication between users. Instant messaging was not allowed and blogging and media sharing platforms were also limited. Also the introduction of new email practices did not end the practice of group emails.

5 CONCLUSIONS

The landscape overviews provided by this research can help industrial organisations to better understand the opportunities offered by Web 2.0 technologies and drivers and constraints behind their adoption by industry. Even with the continual evolution of technology the principles behind the landscape overviews remain relevant.

REFERENCES

- Daniel, D., 2007. Seven Ways CIOs can introduce Web 2.0 technologies into the enterprise. *CIO Business Technology Leadership*. Available at: www.cio.com.au/index.php/id;1146975385 (Last accessed: 8 January 2010)
- Hoover, I., 2007. Web 2.0 tools in business: Proceed with caution - enterprise 2.0 must overcome concerns about security and ROI to gain a foothold in business. *Bank Systems & Technology*, 44(4), pp. 41.
- O'Reilly, T., 2005. *What is web 2.0*, Available at: oreilly.com/web2/archive/what-is-web-20.html (Last accessed: 8 January 2010)
- Robinson, H.S., Carrillo, P., Anumba, C., and Al-Ghassani, A., 2005. Knowledge management practices in large construction organizations, *Engineering, Construction and Architectural Management*, 12(5), pp. 431 – 445.
- Wiens, J., 2007. Is web 2.0 inherently insecure? *Network Computing*, 18(7), pp. 22.
- Wittemburg, K., 1995. Group asynchronous browsing on the world wide web, *Proceedings of the 4th International World Wide Web Conference 1995*, Boston, MA.