Web 3.0 and the organisation
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ABSTRACT

This article investigates the next generation of web technologies referred to as Web 3.0 and assesses their influence on the organisation. Having defined Web 3.0 as the integration of Web 2.0 and the Semantic Web, the research identifies potential benefits and explores the effectiveness of Web 3.0 technologies in supporting innovation, increasing productivity and freeing human resources so that they can be used to better serve business development. It then examines the impact Web 3.0 has on the social organisation and addresses adoption issues.

Keywords: Information Management, Knowledge Management, Social Technologies

INTRODUCTION

Background

Web 2.0 (O'Reilly 2005) is a user-centric web environment where information modelling is based on non-standardised user-generated folksonomies and innovation originates in social interaction (Patrick & Dotsika 2007; Hayman 2007). The Semantic Web (Berners-Lee 2001) is a machine-centric framework of web standards, semantic-driven, with formal classification schemes and highly searchable content. Its innovation is built on find-ability (Hendler 2008; Joo 2011). Both paradigms are based on the interlinking of information and create information networks which are highly dynamic, interactive, adaptive and searchable. Merging the power of the two paradigms requires semantification of web content and begets the new generation of web applications referred to as Web 3.0 (Ankolekar et al, 2007). Semantic technologies coupled with social networking can instigate innovative influence with wide organisational implications that can benefit a considerable range of industries. The scalable business models of social computing and the collective intelligence of organisational social media can be resourcefully paired with internal research and knowledge from interoperable information repositories, accounting systems and back-end databases.

Methodology

The research methodology followed was action research. A combination of
participant observation (Jepsen et al., 1989), process consultation (Schein, 1969) and Soft Systems Methodology (Checkland & Holwell 1997) was applied. The research drew upon interviews and surveys with practitioners, consultants and knowledge workers, as well as document analysis and participant observations. Sources of input were organisations seeking social web knowledge management solutions and companies providing semantic technologies. Information was collected from knowledge workers, information strategists, developers, end-users, online forums and blogs.

MAIN CONTENT

Web 2.0 in the Organisation

Web 2.0 (O’Reilly 2005) was coined in 2005 by Tim O’Reilly and is a selection of technologies and applications rather than an architecture. Web 2.0 focuses on social interaction, end-user involvement and information sharing. The content is user-generated and the information modelling is informal, carried out bottom-up by means of user-generated tag systems. Data and information are seen as the driving forces. Paired with the relevant business practices, Web 2.0 gave birth to Enterprise 2.0, a term that describes the set of Web 2.0 technologies enabling access to collective intelligence within organisations. These core technologies enable innovation through websites/sources of collective content with functionality that gets enriched as more people use them.

The heart of Web 2.0 is social. The word “social” is used to form numerous compound terms such as social- computing, media, software and networks. Social computing has transformed digital economics with business models that are scalable, have low barriers for entry and are sustainable in the long term. Harnessing the power of social computing has created the need for organisational strategies that reflect the shift in online culture (Li & Bernoff 2008). The social organisation can be enclosed within the firewall when social interaction is limited to organisational networking and in-house communities of practice, or can tap into the rest of the web and maximise its use of collective intelligence. In the case of organisations with digital presence, user interactions in social networks, paired with effective communication govern the revenue models. Increasing the member base becomes crucial when the revenue model is advertising, willingness to pay is the prominent driver for a subscription model and trust is of paramount importance for revenue based on transactions (Enders et al., 2008).
Semantic Web in the Organisation

Tim Berners-Lee introduced the Semantic Web (SW) in 2001 (Berners-Lee 2001) as a form of web content where knowledge representation is standardised and relies on languages expressing information in a machine process-able form, by means of a framework based on RDF (Resource Description Framework) and ontologies. The information modelling is predominantly top-down and it is done formally, without the participation of end-users.

The organisational impact of the Semantic Web is based on system interoperability and adaptive, personalised information access. Interoperability addresses heterogeneity issues present in data and business processes and it ensures information integration across systems, a process too costly for any organisation. Interchange, distribution and creative reuse are a Semantic Web inherited standard, while scalability is dependent upon increasingly powerful implementations (Ankolekar et al, 2007). Adaptive technologies facilitate the tailoring of information access according to given user profiles. Intelligent information integration and agents such as information brokers, filters, personalised search agents and knowledge management services are examples of innovative applications.

Combining Web 2.0 and Semantic Web capabilities: Web 3.0

Following action research within organisations seeking social web knowledge management solutions, the research collected information from a variety of stakeholders. Gathering the aspects of significant impact from an organisational point of view, we focused on content generation, distribution, retrieval and deployment. According to our results, content generation is the category that stands out in terms of enhanced performance.

The result is not a surprise as Web 3.0’s main strengths are personalisation, custom and on-demand content. Distribution does not fare any different to previous web frameworks and there is no evidence that content search would improve that of the Semantic Web. Advanced automation enables networking to be content- as well as consumer-directed. The scalability and tractability attributed to Web 2.0 are not that clear in Semantic Web environments and they have been deliberately left undefined. Table 1 below presents the results of the analysis.

Web adoption brought on change that is often explained by means of the e-adoption ladder model (Martin and Matlay, 2001; Jones et al., 2003). The model depicts web-based organisational change as a linear process. The arrival of Web 2.0 and the consequent adoption of social software and web services revolutionised business processes and employees’ behaviour and lead to radical changes that are yet
to be sufficiently measured and analysed. The actual extend of this change is neither matched by that of the Semantic Web, nor is predicted for Web 3.0.

<table>
<thead>
<tr>
<th>Organisational aspect</th>
<th>Web 1.0</th>
<th>Web 2.0</th>
<th>SW</th>
<th>Web 3.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seamless, on-demand content</td>
<td>×</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>(no support)</td>
<td></td>
<td>(v.good support)</td>
<td></td>
<td>(excellent support)</td>
</tr>
<tr>
<td>Info analysis: Personalisation -</td>
<td>×</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>tailoring</td>
<td></td>
<td>(good support)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Info synthesis: Custom mashups</td>
<td>×</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Interchange, distribution,</td>
<td>×</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>creative reuse</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ownership</td>
<td>individual</td>
<td>shared</td>
<td>either</td>
<td>either</td>
</tr>
<tr>
<td>Networking</td>
<td>×</td>
<td>content-directed</td>
<td>content-directed</td>
<td>content- or consumer-directed</td>
</tr>
<tr>
<td>Search</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Scalability - tractability</td>
<td>×</td>
<td>✓</td>
<td>? (unresolved)</td>
<td>?</td>
</tr>
<tr>
<td>Web services – cloud computing</td>
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<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Media-centric capabilities</td>
<td>×</td>
<td>×</td>
<td>limited</td>
<td>limited</td>
</tr>
</tbody>
</table>

Table 1. Web 3.0 benefits for the enterprise

All types of organisational change are, depending on the type of company, present in and influenced by Web 2.0, Semantic Web and Web 3.0 environments. Change in organisational processes is predominant in organisations adopting web services and cloud computing. It is process-focused and largely dependent on workflow optimisation. As such, it is prevalent in the implementation and composition of web services, especially when composition standards are present (web service orchestration and choreography), and therefore best supported by the Web 3.0 infrastructure.

Automated service discovery, a field that has proven problematic, is another area that stands to benefit (Klusch et al, 2006). Organisational functions are equally influenced by resource allocation and decision support mechanisms (Bonatti et al, 2006). Value changes identified were predominantly cultural and changes in power
were linked to scalability issues. There is no evidence to suggest that Web 3.0 facilitates scalability more than its predecessors.

**CONCLUSION**

**Findings**

Web 3.0 contributes positively to all aspects of organisational content generation, distribution, retrieval and reuse. The content-directed networking of previous web generations is maintained and supplemented with a consumer-directed choice. Deployment of web services and cloud computing remain the major promoters of scalability and sustainability. The Web 3.0 framework yields the best results in enhancing and maintaining information quality. Contextual data quality, accessibility and representation fared better than, or as well as, the best other category, apart from intrinsic data quality.

**Practical implications**

The research informs and influences organisational policy by providing evidence that adoption of Web 3.0 technologies enhances information quality, enables innovation and facilitates content generation, distribution and retrieval.

**REFERENCES**


Joo, J., Adoption of Semantic Web from the perspective of technology innovation: A grounded theory approach International Journal of Human-Computer Studies Volume 69, Issue 3, March 2011


