

## Social Network Software in Enterprise Supply Chains

Vladimir Zlatanov<sup>1</sup>, Susan Grant<sup>2</sup>

<sup>1</sup> School of Engineering and Design, Brunel University, Uxbridge, UB8 3PH, UK  
Vladimir.Zlatanov@brunel.ac.uk

<sup>2</sup> School of Engineering and Design, Brunel University, Uxbridge, UB8 3PH, UK  
Susan.Grant@brunel.ac.uk

**Abstract** The authors review the state of the art of the use of social network software and services in enterprise environments. The authors look at how they relate to knowledge management, social network evolution, personnel development, and possible risks and benefits of deployment in a modern enterprise environment.

### 1. Introduction

As part of the KNOWNET project, a 4 year project, funded by the FP7 EC Industry-Academia Partnerships and Pathways (IAPP) - Marie Curie Actions [1], the authors surveyed the state of the art of applications of social network software in enterprise supply chains environment. The aims and objectives of KNOWNET are to develop, build and test an interactive Supplier social network framework (SSN), designed to support innovation and learning where both explicit and tacit knowledge and experience of suppliers and their employees can be shared.

There are many definitions of social networks, one of the best is given by boyd and Ellison in their paper "Social Network Sites: Definition, History, and Scholarship" [2]

*"Web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system."* [2]

The definition does not itemise possible services provided by web sites or groups of websites. It defines the subset of functionality necessary to identify a service as a Social Network. This subset is what enables and reinforces social interaction, allows creation and updates of different relational ties. Specialised Social Networks provide services and content tailored to a particular type of interaction, service type, or niche.

The authors are interested in the applications of Social Networking Technologies in the enterprise, especially within the supply chain. A Supplier Social Network (SSN) is a specialised Social Network that provides services for the Supply Chain in an enterprise environment. The goals of the SSN are diverse, and can include to improve communication, to supplement existing knowledge management tools, sales, marketing, and develop team building, but in all cases it is a tool to reinforce and augment already existing social structures and business processes. The main difference of the applications of social networking technologies in a supplier network to those in an enterprise, is that of organisational scale, and as such there are more nuanced risks and challenges, as discussed in the relevant section of this paper.

Organisational adoption of Social Networking technologies is driven by issues such as employee expectations about using new communication channels, improving and enhancing organisational sustainability, internal development through knowledge sharing. It is recommended that to achieve involvement through the use of information communication technology (ICT), organisations must concentrate on the learning aspects of ICT. [3]

## **2. Knowledge Management**

Knowledge management (KM) is the process of capturing, developing, sharing, and effectively using organisational knowledge. It refers to a multi-disciplined approach to achieving organisational objectives by making the best use of knowledge. [4] KM technology can provide the network of links between geographically dispersed actors that enables effective knowledge sharing. This privileges an information processing view, where knowledge is seen as inputs to be transferred and processed using technological networks to produce certain outputs. Knowledge is isomorphic to the skills and abilities of individuals and assumes that its transfer through networks to be unproblematic. This approach to KM fails to take into account the pre-existing organizational structures and cultural values that lead different groups to have divergent interpretations of what needs to be done. It unrealistically assumes that building networks that provide structural links between the different groups will automatically produce knowledge creation and sharing. [5] [6]

Another perspective, views knowledge as embedded in, and constructed from and through social relationships and interactions, forming a community network. Knowledge, unlike information, cannot simply be processed; rather it must be continuously re-created through dynamic, interactive and social networking activity. This view recognises that knowledge has to be continuously negotiated through interactive social networking processes. Thus the community model emphasises dialogue occurring through active and systematic networking (which may be IT-enabled) rather than linear information flows. [5] [6]

Both approaches can be supported via social networking tools, although the community model is a natural fit, requiring less explicit structure. Of high importance are both the overall network structure and actors (individual people, organisational units and ad-hoc group) position in the network. By occupying a central network position, an actor is more likely to access useful knowledge from other actors. [7] Social software is flexible enough to support how people work currently, and to allow for new, innovative uses inspired by practice. Unlike classic KM systems, social software applications do not require either employees or organisations to radically change their practices. They are flexible enough to allow adaptation to existing practices, allowing for organic growth and development [8].

Of increased importance is the capturing and preservation of tacit, implicit, knowledge, difficult to transfer to another person by means of writing it down or verbalizing it, "we can know more than we can tell." [9] By its nature, capturing content and surrounding it by conversation in a social context, social network software enables the preservation and exploration of tacit knowledge. It helps in preserving the continuity of knowledge on both short and long term timescales, while encouraging the reinterpretation through online conversation and collaboration. It helps diminish the loss of knowledge through employee turnover. [10] [11]

### **3. Social capital**

Social capital can be defined as the expected collective or economic benefits derived from the preferential treatment and cooperation between individuals and groups. [12] The idea presumes that analogously to other forms of capital, social contacts affect the both individual and group productivity. [11] [13]. In the context of knowledge management social capital can be seen as an indirect measure

of the potential for knowledge transfer between different actors within an organisation or its supply chain.

Narrowly the concept can be seen as a measure of influence of an individual in a group. Digital social networks enable transparent and convenient accumulation and exploitation of social capital – enabling or facilitating reach out, knowledge discovery and exploitation, and team building among many other applications. [14] [15]. Social capital is viewed as providing dual benefits, both for employees and the enterprise itself. Building one's social capital can be beneficial for the career development of individual employees. [16]. By building their social capital, employees become more recognisable as authorities in their field of expertise and interest. On another hand, social capital measures can be used to provide insight into team and company communication, organisational and interpersonal dynamics and be used for improvement and validation of human resources, management practices, and knowledge exchange.

Of particular relevance to Supplier Social Networks (SSN) is the study of Inkpen and Tsang [17] on how social capital dimensions of networks affect the transfer of knowledge between network members. They distinguish among three common network types: intra-corporate networks, strategic alliances, and industrial districts. Using a social capital framework, they identify structural, cognitive, and relational dimensions and their properties for the three network types. Although online social networks may introduce changes, their study provides a useful framework for analysing social capital in SSN.

#### **4. Social media tools**

There are many different types of social media tools which can be used in enterprise environment. A list the some of the most important ones, ordered by increasing cognitive effort of contributions or contribution size:

1. SOCIAL BOOKMARKING – is a centralized online service which enables users to add, annotate, edit, and share bookmarks of web documents. Examples include Delicious, Reddit, Digg, StumbleUpon...
2. MICROBLOGGING – for example twitter, yammer, identica, laconica, etc... It is a broadcast medium similar to, but different from a traditional blog in that its content is typically small in both actual and aggregated size. Micro-blogging

exploits the scarcity of attention and optimises interaction with those few that matter and that reciprocate their attention. [18] [19] [20]

3. BLOG – a discussion or informational site published on the world wide web, consisting of discrete posts, typically displayed in reverse chronological order, sometimes referred to as “river of news”. Each blog post is typically written by an individual, often soliciting conversation on a topic of interest. Blogs could be written by individuals or groups of people with common interests. [3] [21] [22]
4. WIKI – is a web site which allows people to collaboratively add, modify, or delete. Text is usually written using a simplified markup language or rich text editor. It differs from a blog or other CMS in that the content is created without any defined owner or leader, little implicit structure, allowing structure to emerge according to the needs of the users. [23] [24] [25] [26]

It is important to note the importance dynamics of content, living in different types of social networking software. Individual pieces of content maintain their importance on different time scale by design and intent. Micro-posts are of a relatively short term importance. The relevancy time interval of blog posts is longer than that of a micro-post. Wiki pages, by their nature, tend to be of a long term nature, their content evolving with time to reflect the change in environment. The mostly unstructured nature of social media tools is both a blessing and a curse. It allows the evolution of the content macro-structures that fit right within the organisational context. Organisational units, ad-hoc groups of interest tend to emerge naturally within the content structure. But the unstructured nature of these types of systems can be confusing, hard to bootstrap –there is a need to provide initial content, starting resources and training. [27] [28] [29] [30] [31]

## **5. Benefits for companies**

It is becoming increasingly important for companies to provide internal social software tools, even if only to breach the generation gap – digital natives are used to social type software as a dominant communication means. [32] The benefits go beyond generation change. First, for improving and blending the organisational memory with person to person communication - improves the discovery, recall and creation of knowledge within the network, enables the preservation and propagation of tacit knowledge in environments with high employee turnover. [10] [11] Second, by keeping control of social tools inside the enterprise the asso-

ciated data related to connections, activities, and interests of employees is available, archivable, providing new sources of information for understanding the people and their interactions within the company or even the whole supply chain. The tools not provided in house may be found outside, which results in a number of different security concerns. [27] [32]

Studies indicate that social networking tools trend to strengthen and intensify weak ties, indirect, friend of a friend type of connections. [27] [32]. The result of closer relations between distant parts within the network enables and make more likely communication patterns are not plausible before the introduction of such technology. Social networking software brings close both organisationally and geographically distant parts of the enterprise. The reduced importance of physical, face to face contact, improves support for telecommuting work practices, with implications on employee satisfaction and quality of life. [33] There are indications that knowledge worker productivity increases with the introduction of social networking technology, which should result in higher return on investment (ROI). As it is hard to measure productivity increases and ROI other measures, such as return on contribution (ROC), are being proposed. [34] They can be used to measure collaboration, performance of social media tools, information useful to employees, managers, and system administrators.

## **6. Risks and challenges**

Most frequently risks related to (i) legal, (ii) privacy and security, (iii) intellectual property, (iv) misuse and abuse, (v) employee resistance issues are observed in enterprise deployments. Even assuming secure, bug free software architecture, all of these groups of risks are still present. The first three are related to user generated content. The latter two are social network risks. Scope of access should be carefully considered, for example, different risks arise in internal social networks, those integrating the supply chain, or those targeting company employees and customers. [35]

The legal risks arise from existing general or industry specific regulatory frameworks and the implications of employee created content. They are related to most of the other risks, for example all of leaking customer personal or financial details, copyright violations, or abusive language can result in legal challenges. Improper language, not obtaining permission, false information, collection of personal in-

formation and profiling based on race, ethnicity, medical conditions, regulatory compliance violations are some examples of activities which may lead to legal challenges. Security risks stem from opportunities of intentional or unintentional disclosure of sensitive information or introduction of malicious code on internal system either by external or internal, but not authorised, parties. There is an ever increasing catalogue of threats and exploits. Care should be taken to keep software up-to date, have stringent security policies and practices. A significant legal liability comes from unauthorised intellectual property and copyright violations, for example failure to obtain appropriate permissions for use from individuals and organisations, prior to creating content. Employee reluctance to use enterprise social networks can be a serious barrier for successful deployment. User training, resource availability, and support skills, initial content seeding should be considered in the social network planning and implementation stages. Social networking may lead to the misuse and abuse of Internet resources. Areas of concern include the misuse or waste of time or money, harassment, and hogging network resources

There are a number of mitigation mechanisms; the following shortlist highlights some of the more important ones to consider:

1. GOVERNANCE AND POLICY – formal governance structure and well defined policies for permissible content, usage, procedures for making contributions
2. EDUCATION – sufficient end-user education to reduce resistance to use
3. ACCESS CONTROL – well defined access control and layered security measures that utilize reputation-based filtering, intent and behaviour analysis, and signature scanning must be considered in order to reduce systematic security risks from unintentional disclosure of information. [36]
4. MONITORING AND FILTERING – a combination of human and technology based solutions to monitor content creation, updating and usage to determine or enforce compliance with corporate policies and ethics

## **7. Summary**

Social networking technologies can provide a number of benefits to the modern enterprise and its supply chain. They are well suited to track information exchange structures in the current fast-paced market constantly evolving market conditions. [37]

Social networking technologies provide technological support for organisational learning and knowledge management, by encouraging and supporting evolving, dynamic communities of practice, information and knowledge creation, propagation, exploration and exploitation.

Social networking technologies can provide the tools suitable for a multi-scale time intervals content and knowledge relevance, as well as reflecting organisational unit size – from individual, through teams and groups, to the organisation and its supply chain.

The benefits to individual employees range from improved career planning and visibility within the organisation, through social capital building, improved productivity, to potentially better quality of life through telecommuting.

The risks to adoption must be considered before deployment. To be successful social networking implementations must have management backing and sufficient technical support resources.

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