

The Networked Enterprise

Current and Future Trends in IT-based Collaboration

Alexander Richter¹ and Alexander Stocker²

¹Cooperation Systems Center Munich, Bundeswehr University Munich, Neubiberg, Germany

²Information and Process Management, Virtual Vehicle Research Center, Graz, Austria

Keywords: Web 2.0, Collaboration, Social Software, Work Practices, Networked Enterprise, Future of Work.

Abstract: Based on data and experiences gained in projects aimed to implement social software into German-speaking enterprises, we identify and discuss four observed phenomena concerning future developments in IT-based collaboration environments: new organizational structures, changing communication practices, increasing individualization of employees and blurring of boundaries between work and life. Additionally, this position paper exemplarily provides and discusses two feasible solution approaches to cope with identified trends and their impact and lists relevant case studies. The presented research-in-progress is dedicated to application oriented scientists in order to understand socio-technological aspects, when implementing Web-based information systems in order to facilitate communication, cooperation and knowledge sharing.

1 INTRODUCTION

We live in a world, which becomes more and more connected by information technology (IT). Social networks including Facebook and Twitter are omnipresent and used in various ways. They enable us to connect, communicate and stay in contact with our friends and family anytime and from almost anywhere. We share ideas, opinions and knowledge with like-minded people in broad or specialized communities on the Web. The so-called Web 2.0 platforms (O'Reilly, 2005) that enable these practices are easy to use and empower sharing and participation (Boyd and Ellison, 2007). They have caused technological and social changes to enable new forms of interaction with persons living more than 1000 kilometres away in other time zones (Nardi et al, 2004).

At the same time, the new participative Web affects also enterprises on a large scale (McAfee, 2006). It allows humans to share their experiences on products and services, engaging with enterprises in an open dialogue and participating in online campaigns for or against enterprises. Hence, most enterprises are to some extent active or at least visible in the social Web and therefore are much closer to their customers, partners and competitors than ever before (McKinsey, 2009).

However, Social networks have not only proven

their power to facilitate communication to and between customers. As a result of applying technologies that emerged on the public Internet to the inside of organizations with a view to facilitating workplace communication and collaboration the relatively new phenomenon of Enterprise social networking (ESN) is evolving.

Internal communication and collaboration can benefit much, when implemented Web-based information systems are designed according to the principles of the social Web. Web-2.0-based information systems include for example wikis, weblogs, microblogs and social networking services (Arazy et al, 2009; Efimova and Grudin, 2007; Hughes et al, 1992; Stocker et. al, 2012).

New technologies enable goal-oriented employee to employee communication, efficient transfer of knowledge and facilitate internal social networking practices (Richter et al, 2011). The increased visibility of own activities and the increased awareness about the conducted actions of others (by being active on internal Web platforms) lay the foundation of higher employee participation and unlock a huge potential for innovation. Therefore internal social networks have recently gained increased importance in corporate settings (DiMicco et al, 2008). From an employee's perspective a social network can be both, an own megaphone and a mighty feedback channel and it therefore holds the

potential to break down corporate information hierarchies and to support cross-functional, cross-departmental, and cross-disciplinary collaboration (Paroutis and Saleh, 2009).

Globally networked employees are a catalytic converter for a new working world. It has become apparent that much of it is not only a technological development, but a step-by-step transformation from a traditional organization to a networked one (Bar and Simard, 2010). Besides the ongoing linkage of value-adding processes, individual communication and collaboration patterns begin to transform, too. Voluntariness in the organizational adoption of networked workplace technologies plays a major role and has recently become a subject of investigation (Vehring et al, 2011).

Against this background, we discuss four observed phenomena concerning future developments in IT-based collaboration environments in our position paper. We base our study on a comprehensive set of data gained while investigating the usage of social software in organizations. After an explanation of observed trends we will exemplarily highlight two feasible solution approaches to cope with them.

2 EMPIRICAL AND METHODOLOGICAL FOUNDATION

Between April 2007 and September 2012, we have explored the adoption of social software in enterprises by using both, a quantitative and a qualitative way. The data on which this position paper builds upon results from an investigation of more than 20 organizations, including global players (e.g. Allianz, Bosch, EADS, SAP, Siemens) as well as innovative small and medium organizations (e.g. Communardo, Deutscher Schiverband, Pentos).

More than 200 interviews and more than 20 meetings with people responsible for communication and collaboration platforms have been conducted. The original goal was to explore existing work-practices and modes, to find out how Web-based platforms have been used in the corporate intranets. The majority of the interviews were conducted in face-to-face situations, whereas some of them were conducted via telephone. Interviews have been recorded, transcribed and qualitatively assessed. Based on the method of Flanagan (1954), critical incidents have been identified as subjects of investigation. A critical incident (CI) is defined as a

representative situation, which may result in positive or negative consequences for participants. Requirements for a CI are soundness and descriptiveness of a particular situation and the caused reaction.

Besides conducting interviews, the authors have been closely working in implementation projects for social software in the enterprise and were able to use ethnographical approaches (Hughes et al, 1992), too. At the same time, we were able to study the content from Web-based communication platforms by using genre analysis to investigate recurring patterns of communication and to build up an understanding of the occurring communication practices (Riemer and Filius, 2009). Based on the different data sources and different assessment techniques, the authors aimed to establish a best possible reliability and validity of results (Yin, 2003).

Based on the explored data, a number of patterns and trends have been identified, which will be drafted in the following section.

3 IDENTIFIED TRENDS

3.1 New Organizational Structures

We experience a change in structure on multiple layers. On the one hand, current Web-based technologies available to a particular knowledge worker differ from the past ones. Collaboration tools, which have in the past supported singular tasks, have transformed to powerful *collaboration infrastructures*, supporting everyday working live as a whole, making a knowledge worker much more flexible to cope with changing work requirements. As communication is more and more conducted between employees and adjusted to their special needs, historically-established information hierarchies begin to slowly break down. Hence transparency on the level of an employee will increase by using new collaboration infrastructures, and therefore a *new leadership culture* is required to cope with it. 'Management' as defined by controlling, rules and instructions will (have to) transform into 'leadership' as defined by trust, commitment and dialogue.

3.2 Change in Communication Practices

Currently, the number of available communication channels is increasing on a wide scale, and employees are confronted with challenges on how to

select the right medium for the right message, i.e. it is not clear, which tool has to be used to achieve particular communication goal, see for example (McAfee, 2009). At the same time Web-based platforms begin to transform to collaboration infrastructures, which are ‘open to use’ (Stocker et al, 2012) i.e. which allow manifold modes of use. Hence the potentials of such platforms are unlocked by employees during their appropriation process (Stocker et al, 2012). Employees are confronted with *uncertainty*, what information shall be communicated in which way at what time.

Moreover, the increasing number of communication channels and the eased access to information (i.e. the increasing number of employees-generated content) leads to a *perceived information overload*. The *ubiquity of communication tools* (see figure 1) additionally facilitated by the triumphal procession of mobile devices and open access terminals) leads to a *change in personal interaction* and therefore to a change in individual communication practices as a whole.

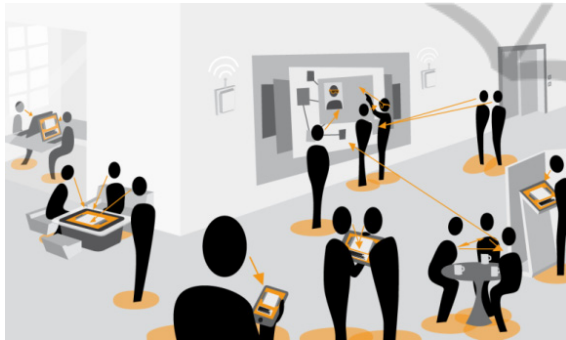


Figure 1: Ubiquity of communication media.

3.3 Individualization of the Working Environment

Transforming individual communication practices affects the way of working. Performing work becomes more and more individual, which raises challenging requirements to a both comfortable and secure working environment. Therefore different user groups and their individual properties have to be taken into account (see table 1), to assure that new Web-based technologies can be successfully adopted to assure the working environment of the future.

It becomes apparent that the demographic change in the enterprise is a huge challenge, but the adoption of information technology is affected by a plethora of other aspects coming an individual style

of working. Technology acceptance is not only a question of the generations.

Table 1: Differentiation between user groups.

Technology	Organization
Access to mobile devices (blackberry)	Hierarchy, department, tasks & functions
Remote access (VPN)	Organizational Unit (Language, culture)
Usage limitations (accessibility)	Working time model (e.g. home-working, availability)
	Location and region (working hours, time shifting)
Human	
Age group	
Affinity to information technology	
Motivation and goals Knowledge and experience	

3.4 Blurring of Boundaries between Work and Life

The increasing usage of Web-based platforms in private and business life causes a *blurring of boundaries between work and life*, because the same communication channels are used in private and business context (Fear, 2011). This aspect is even strengthened by the increasing number of mobile devices including smartphones and tablets. On the one hand, many employees use their private mobile devices in business, a phenomenon which is termed ‘bring your own device’. This development is additionally contributed to by employees using the same Web- based platforms, e.g. Dropbox or Google Drive, in private and business context, a behavior termed ‘bring your own service’. Whenever the same communication infrastructure is used around the clock, users often violate the policies of their companies.

On the other side, it is possible to dictate what employees are doing, when they are outside the workplace. Though employees should be free of work demands in their spare time, the ability to contact an employee outside the company at any day by email, phone or Web-based platforms is a form of soft-control over workers. Hence, the resulting 24-hours availability is experienced as heteronomy by many employees.

Besides that, as people are more and more connected, *organizational borders start to open*,

which enables new modes of communication to external stake holders through Web-based platforms. But even in the same organization, project teams start to communicate and collaborate across traditional disciplines and territorial boundaries on the intranet.

4 APPROACHES TO COPE WITH IDENTIFIED TRENDS

Responding to the identified trends can be done at different levels and accompanied by different expenses. At this point, the authors want to discuss two approaches, which they used in their projects to take advantage of potentials and avoid hazards.

The already introduced uncertainty among employees regarding their open choice in media and communication channels (most notably social software) can be reduced by different actions. An easy way is to collect usage examples in reports and lessons learned. Users may share their own success using a particular platform (i.e. *collect individual success stories*). This can be done in the employee newsletter or as part of online documentation in the form of a microblog post with a sounding hash-tag (e.g. #bestpractice). For example, when introducing the Web 2.0 platform 'References@BT' at Siemens Building Technologies Division, success stories of employees were used to further disseminate the platform in the Siemens intranet (Mueller and Stocker, 2011; Mueller et al, 2012).

Even more important, but absolutely necessary, is to make the plethora of evolving, existing, complementary or overlapping platforms accessible from a single access point. This may result in a more centralized platform. For instance, numerous Wikis were migrated into one central Wiki, establishing the 'Wikisphere' at Siemens (Lindner, 2011). The other archetype is to link existing platforms to a centralized portal (i.e. *establish a central access point*). Enterprise Search portals may be established to allow employees access to other platforms from a single portal. Siemens has recently launched 'Technosearch' to enable search across multiple platforms in the Siemens intranet (Sinequa, 2012).

An approach to support employees and to react against the blurring of boundaries between work and life is to provide opportunities for them to work independently from time and space. On the one hand *additional leeway* should be created for intrinsically motivated employees, but extrinsically motivated employees need *clear areas of responsibility*. At the same time, employees always need a way to state

their 'non availability'. Coaching them will support employees to become aware of their increasing responsibility and to take the advantage of just turning out their smartphone at home from time to time. At the same time, a connected organization has to also approve the positive aspects of the blurring of boundaries, for example it has not only to allow the conduction of care services and educationally tasks during working hours, but also to promote and fund it.

5 CONCLUSIONS AND OUTLOOK

In this position paper we have discussed the ongoing transformation in the work practices of enterprises in German-speaking areas including the transformation of communication practices, the increasing individualization, new organizational structures and the blurring boundaries of work and life.

Based on our experiences in social software projects, we have exemplarily mentioned two approaches, how to cope with identified trends. Nevertheless, solving the emerging challenges is not as trivial, as corporate or employee representatives still suspect.

We think that the widely noticed decision of the VW works council to turn off Blackberry email after work hours (Volkswagen, 2011) is a step into the wrong direction. Employees including for example young parents should not be patronized, but rather empowered for more self-organization in performing work from their home office. This includes having access to corporate information anytime anyplace, as access to information is crucial to job success.

While some enterprises attract the attention of researchers and press by conducting questionable actions, most of the enterprises have not even recognized the presented trends, yet. Sometimes they have only become aware of symptoms, including dissatisfied and exhausted employees or difficulties to get attractive for younger staff including digital natives, endangering their competitiveness.

It will be exciting to observe, when organizations and employee representatives will not just treat observed symptoms anymore, but together take on the challenges currently emerging from the rapidly changing world of work, stimulated by the emergence of new collaborative information technology and Web-based infrastructures.

REFERENCES

- Arazy, O., Gellatly, I., Jang, S., Patterson, R.: Wiki Deployment in Corporate Settings, *IEEE Technology and Society Magazine*.
- Back, A., Koch, M., 2011: Broadening Participation in Knowledge Management in Enterprise 2.0. *Information Technology*, Vol 52, Issue 3, pp 135-141.
- Bar, F., Simanrd, C., 2010: From Hierarchies to Network Firms, Lievrouw, L., Livingstone, S., *Handbook of New Media: Social Shaping and Social Consequences of ICTs*, Sage Publications Ltd.
- Boyd, D. M., Ellison, N. B., 2007: Social network sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication*, 13(1), article 11.
- Efimova, L., Grudin, J., 2007: Crossing boundaries: A case study of employee blogging, *Proceedings of 40th Annual Hawaii International Conference on System Sciences*.
- Fear, J., 2011: Polluted time. Blurring the boundaries between work and life, *Policy Brief* No 32, ISSN 1836-9014.
- Flanagan, J. C., 1954: The critical incident technique. *Psychological Bulletin*, 51, 327-359.
- Lindner, B., 2011: Confluence as Corporate Wiki, *Presentation*, User Group Munich.
- O'Reilly, T., 2005: What Is Web 2.0: Design Patterns and Business Models for the Next Generation of Software, *Essay*, O'Reilly Group.
- Hughes, J. A., Randall, D., Shapiro, D., 1992: Faltering from Ethnography to Design. In: *Proceedings of the ACM Conference on Computer-Supported Cooperative Work*, New York, 115-122.
- McAfee, A., 2006: Enterprise 2.0: The Dawn of Emergent Collaboration, *MIT Sloan Management Review*, Vol 47, no. 3.
- McAfee, A., 2009: Enterprise 2.0: New Collaborative Tools for Your Organization's Toughest Challenges, *Book*, McGraw-Hill Professional, Boston.
- McKinsey, 2009: How companies are benefiting from Web 2.0: McKinsey Global Survey Results, *McKinsey Quarterly Report*.
- Mueller, J., Krchnavi, J., Stocker, A., 2012: Global Knowledge exchange using References+ within the Siemens intranet, Innovation and Transformation through Knowledge Management, *Report*, Ark Group.
- Mueller, J., Stocker, A., 2011: Enterprise Microblogging for Advanced Knowledge Sharing: The References@BT Case Study. *Journal of Universal Computer Science*, Vol. 17, Nr. 4..
- Nardi, B., Schiano, D., Gumbrecht, M., Swartz, L., 2004: Why web log, *Communication of the ACM*, Vol 47, Issue 12, pg 41.46.
- Paroutis, S., and Saleh, A. 2009. Determinants of knowledge sharing using Web 2.0 technologies, *Journal of Knowledge Management* (13:4), pp 52-63.
- Richter, A., Koch, M., 2008: Functions of Social Networking Services, *Proceedings of the International Conference on the Design of Cooperative Systems*.
- Richter, A., Riemer, K., 2009: Corporate Social Networking Sites—Modes of Use and Appropriation through Co-Evolution, *Proceedings of the 20th Australasian Conference on Information Systems*.
- Riemer, K.; Filius, S., 2009: Contextualizing Media Choice Using Genre Analysis, *Business & Information Systems Engineering*: Vol. 1: Iss. 2, 164-176.
- Stocker, A., Richter, A., Höfler, P., Tochtermann, K., 2012: Exploring Appropriation of Enterprise Wikis: A Multiple-Case Study. *Computer Supported Cooperative Work*, 21(2-3), 317-356.
- Sinequa News, 2012: Siemens Counts on Sinequa, *press-release*.
- Vehring, N., Riemer, K., Klein, S., 2011: "Don't pressure me!" Exploring the Anatomy of Voluntariness in the Organizational Adoption of Network Technologies, *Proceedings of International Conference on Information Systems – ICIS 2011*
- Volkswagen, 2011: Volkswagen turns off Blackberry email after work hours, *BBC News*.