Microblogging as a Tool for Networked Learning in Production Networks

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Abstract

Web 2.0 has remarkably changed the internet in recent years. By its focus on technical simplicity and usability, it turned the mere recipients of the early internet into content contributors. Web 2.0 now becomes more and more relevant for the division of labour in modern industrial context and within the service economy. One of the newest communication methods with respect to Web 2.0 is Microblogging. Small snippets of information, mostly with informal content, serve as status information about people and topics. Based on these snippets and some new connection methods, a network evolves, which enables closer social ties and information sharing.

This paper addresses the potential of Microblogging technology to improve learning, knowledge sharing and competence tracking in production networks. By exemplifying how modern production networks work and what they are good for, the authors show that a Community of Practice (CoP) is the native mode for efficient collaboration and learning. Furthermore, they state that Microblogging might be the appropriate instrument for enhancing this kind of inter-organisational CoPs.

Keywords

production networks, Web 2.0, Enterprise 2.0, enterprise microblogging, communities of practice, networked learning, collaboration, competence cells

Introduction

The production landscape in the 21st century will be shaped by micro, small, and medium sized enterprises (SMEs), acting as autonomous, atom-like entities of production which can be described as 'competence cells' (Müller 2009, Salmons, Babitsky 2001). In order to fulfil complex tasks such as the development of products and services, production processes and sales, those enterprises need to cooperate in networks. Each placed order, or each new customers demand respectively, immediately constitutes a new *production network* of SMEs on a temporary basis. This raises some new issues of extensive networked learning and understanding.

Inter-organisational information flow is an essential part of this work modus. Furthermore, the kind of necessary information is similar to that which plays an eminent role in intra-organisational settings: it is overwhelmingly non-coded or informal respectively. In order to cope with learning and knowledge sharing in intra- and increasingly in inter-organisational settings, the implementation of Communities of Practice (CoP) is a widely preferred method. The latter, i.e. production networks, faces the problem of lacking presence and accessibility of the actors. Issues like these can be addressed by a new emerging technology called 'Microblogging'.

Microblogging is a rather new method of online communication, originating in the realm of Web 2.0. In recent years, Web 2.0 has changed the way in which people address the internet. Contrary to the internet of the 1990s, when they were only recipients, they now are able to contribute to the content of the web. In terms of knowledge sharing and mutual content developing, this has proved some remarkable dynamics. In this respect the online encyclopaedia Wikipedia is best known. Due to mutual efforts of thousands of people, it became the largest encyclopaedia within few years. Microblogging, however, is a means that, by its mode of communication, overcomes many problems that arise in the process of collaboration and knowledge sharing which digital media in the realm of Web 2.0 have to cope with today.

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We start this paper with an outline of production networks and connect this business concept to the management topic ‘Communities of Practice’ (CoP). Then we introduce Microblogging. We show how it works and inform about the potential for appliance as Enterprise Microblogging. In order to do this, we refer to CoPs and production networks as possible use cases.

Learning in Production Networks

Which learning tasks do exist within Production Networks?

Recent research on the projects "Sonderforschungsbereich 457 - Hierarchielose regionale Produktionsnetwerke" ('Non-hierachical regional production networks') and "Paketantrag 196 - Kompetenzzellenbasierte Produktionsnetze" ('Competence cell based production networks'), conducted at the Chemnitz University of Technology, has gained new findings about cooperative processes of production and development that they label "production networks" (Müller, Spanner-Ulmer 2009). We can speak of production networks, if the following conditions exist: process oriented cooperation, distributed product development, work planning competence, production and assembly competence, process oriented quality management. These conditions comprise some typical fields of collaborative activity, information sharing and learning. Members involved in production networks need to have decent information about the other members of the temporary network, their competencies, when and how they enter or leave the process and the other members' role within the network as well as their own role.

A distributed product development process, for instance, begins with an initial event such as a customer order or an idea about a new product. Then, an appropriate 'competence cell' (Kompetenzzelle), which derives from a network of competences, will be established. In case of the development of new products, this would enclose competencies about researching the market potential. The network independently compiles product concepts, conducts R&D and finally produces commodities. Hence, descriptions and evaluations about the competences of the network members are critical, e.g. about their former activities, their capabilities, resources, etc. Furthermore, hooked on the dynamics of innovation, the modality of these competence descriptions and evaluations need to be dynamic, too.

The fact that distributed product development does not only cover single components, but also whole assemblies, raises the complexity of the process and hence the complexity of the documentation about the network, e.g. about work planning, production, and assembly competencies. With respect to quality management, these highly complex processes must furthermore be transparent and represented (for example with maps); concepts must be described as well as methods, norms, and the accomplishment of experience from former projects, and members always need to be up on the current process status. After all, according to these informations, processes need to be collaboratively improved.

Transparency, as stated, is a very crucial momentum for the sake of an efficient production network. Documentation with Excel files and other documents would not work, neither would any static documentation tool. New digital tools in the realm of knowledge management would allow fulfilling the needs of adequate information management. But production networks need more than that. As they are operating in very complex processes in a highly dynamic manner, they need to have a common language, need to be able to recognise weak signals, be up-to-date at all times, etc. Documentation just for the sake of documentation would not be enough here. For the sake of learning, the network members have to collaborate intensely.

Production Networks as Communities of Practice

The aim of efficient learning in production networks could be to establish Communities of Practice (CoP), in which members "become informally bound by the value that they find in learning together" (Wenger, McDermott, Snyder 2002, p. 5). Hence, during the process of learning and knowledge sharing, there are interpersonal and emotional phenomena at stake, such as personal satisfaction, understanding of each other's perspectives, and a feeling of belonging to a group. Such environments fit best to extensive knowledge sharing,

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as the overwhelming amount of knowledge is highly contextual and cannot be shared without considering the contexts of knowing.

Establishing CoPs and cultivating them might be a lot of work, it literally requires "net work" (Anklam 2009). For several years, these processes have been supported by Web 2.0 instruments. Fostering CoPs in Web 2.0 environments might be different from fostering CoPs of the 1990s, which collaborated by phone, meetings and office-architecture. It requires another kind of pedagogic measures plus technical skills. But this new kind of fostering is not necessarily less laborious. Microblogging might be a tool that probably demands much less effort than other Web 2.0 tools. Moreover, it might be the native collaboration tool for CoPs.

Microblogging as a Learning Tool in Production Networks

Technology & Communication Principles

The user-generated web, the so-called 'Web 2.0' (O'Reilly 2005), has - once more - been taking new directions since the introduction of Twitter in 2006. Microblogging platforms like Twitter, Yammer, or Status.net are, technologically seen, rather simple. There is a central server on which the platform is running. Each Browser or mobile client that has access to the internet can be part of the network. Hence, there are nearly no restrictions in terms of accessibility. Simplicity of the user interface is an important factor. 'What are you doing' is all that Twitter wants to know. Users offer news about their personal status, their interests, their engagements to the audience. A news-post has a maximum of 140 characters (other Microblogging platforms allow more characters). There is a public/subscribe principle, i.e. users can subscribe to other users' posts in order to remain up-to-date about the news of those others. By this very simple means, a network evolves.

Microblogging combines some communication principles that are used by different digital media. Comparable to blogs, with Microblogging everybody is able to offer content to a large audience, like with E-Mails, we can address direct messages to certain receivers; like with SMS, we are mobile and quick; like with discussion forums we have a kind of many-to-many communication; like with social bookmarking (e.g. delicious) we see what other members of the network prefer, and like with RSS and Mashup-Feeds subscribers of microblog-channels can filter and arrange the posts according to their needs.

In terms of principles of communication, Microblogging offers some interesting features that other digital media are lacking - despite, or rather because of its simplicity. As a common use case, with Microblogging everything is posted 'to whom it may concern'. There is no need to think about receivers, CCs, and BCCs and the like. Furthermore, E-Mails require some kind of formality, but Microblogging does not. E-Mails also require some kind of answers, but Microblogging does not. The latter does not expect that posts should be answered. This, too, is a great relieve compared with E-Mail, and even more so compared with Instant Messaging (e.g. ICQ, Skype), where non-productive communication is always a threat.

Hence, communication by Microblogging produces less tension than the use of many other digital means of communication. These features are beneficial for knowledge-working environments. Establishing a network of knowledge goes along with connecting workers emotionally. It might be useful to post the personal status, like the present whereabout, personal intention, or even personal mood like happiness, stress, etc. In many settings of knowledge-work this status-information may be of help for instant productivity. Along with this, this kind of updates about colleagues interconnects the network.

So, with Microblogging the user generated web gets enriched with extended knowledge assets, way beyond codified information. Transparency may reach a new level. How exactly does this happen?

Making Improbable Communication Probable

The modern industrial working environment demands not only sharing of codified information but also sharing of contexts of information. Codified information is only the tip of an iceberg of corporate knowledge. The large part is not codified and consists of skills and informal assets. Networked Learning demands addressing these

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particularly difficult knowledge assets. Moreover, many settings demand not only gathering information about the status-quo, but also of the way this status-quo emerged.

For efficient workplace related learning and establishing an environment for information sharing and being up-to-date, a certain pattern of communication must be involved. One important issue that must be overcome is the absence of communication. So, one task would be to make 'improbable communication' (Luhmann 1981) probable. According to Niklas Luhmann there are three different sources of improbability for the success of communication. First, there is the problem of understanding somebody else's communication; second, there is the problem of achievement, i.e. that an interaction by communication happens at all; third, there is the problem of successful communication.

The first addresses the appropriate language, the third addresses the so-called "symbolically generalized communication media" (Luhmann 1995) that are important for the differentiation of society (i.e. for example rights regarding with the law-system, truth regarding with science, money regarding with economy, love regarding with relations). Both these barriers are not at issue in this paper. The interesting barrier for our reasoning is the second one: to *achieve a release of communication*. This problem can be addressed from different points of view. We have, for example, something in mind that might be interesting for somebody else; but we do not have the possibility to send our information right now, or we do not exactly know for whom exactly (e.g. in the organisation, or on the workplace) it may be of interest. As this information might be interesting but is of rather minor importance, it would not be important enough to make a phone call or to write an E-Mail. Communication about this information *would not* happen.

Here, a potential sender of information would not follow his initial intention to send a message, because he could not be sure whether his message would reach a receiver, somebody who is interested or who understands his message at all. Luhmann speaks of barriers of discouragement ('Schwellen der Entmutigung') to address this issue. In terms of knowledge diffusion, the informality that for example coffee-breaks offer is a good means to lower these barriers. Microblogging is another efficient method to do this. A potential sender just needs some kind of blurring intention that we may call: 'maybe somebody is interested'. However, it is possible that potential sender would never know whether his message was of any help for anybody. But because he is aware of the typical use-patterns of Microblogging, he would accept it. This is helpful, as the potential sender does not have to deal with ignorance by others - something that is another source for discouragement by using digital media or in informal settings of face-to-face knowledge-sharing.

With Microblogging, not the sender is responsible for successful communication, but the subscriber is (Böhringer 2009). This conversion is a good solution in many complex settings of information sharing - even regarding formal workflows. Consider a manager who is responsible for parts of a large project. Rather than thinking about for what stakeholders or colleagues the status "We need to fix two more bugs, we are in default by three days" might be important, he would post this status into a Microblogging-system and nobody could blame him for failing his duty to report.

Microblogging in Communities of Practice

Several studies show how fragile knowledge working in communities of practice can be. For example, there are phenomena that Ferreday & Hodgson (2008) call 'tyranny', which derive from the demand to participate in an academic realm by using social media - e.g. "privileging the community over the individual", or in that "individual emotions have to be overcome in the interest of the group" (Ferreday & Hodgson 2008, p. 644).

Microblogging is less demanding than other social media. As described above, there is no demand for feedback or ‘polite nothings’ as it is for example regarding E-Mail communication. As Microblogging can be seen as a kind of many-to-many communication reading posts or replying to them is much less demanded by others than it is regarding E-Mail communication. In large networks, we would always have someone who reads, someone who answers, and someone who benefits.

What makes many Web 2.0 tools successful is this kind of informal characteristics. At last, success derives from a certain mental state of the contributors. They should feel that they are not just doing their duty, but that they can contribute something that is really helpful, that they can do this with the slightest effort and in a purposive,

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goal-orientated way - leaving behind all the dynamics of 'second purposes' (being polite, addressing somebody's feelings, etc.). These 'second purposes' are laborious quite often. They do not play any role in Microblogging. If users want to post about their feelings, this would be a first purpose. It would be the information that wants to be addressed. Microblogging is the only media of many-to-many communication through which the addressing of emotions is accepted. Besides the big challenges that have to be faced by Microblogging-oriented communication, there are big opportunities. As it derives from the pop-cultural tool Twitter, professional Microblogging is the first IT tool that offers a natural acceptance for interlinking information sharing and emotional communication.

Informality in its best knowledge sharing manner occurs due to the publishing/subscribing principle. No post information is meaningless unless the network defines it as meaningless. Therefore it is advisable during the implementation of Microblogging to give good examples for contents of possible posts. The first posts should be sent only after some strategic considerations. What kind of communication would I accept? If my answer is "just rather formal information", I, as a first-mover, would post formal information. This would be examples for adequate usage. If informal information is accepted, too, I would post some news about my mental states, about my current activities, my half-baked ideas, etc. This would steer to another direction of usage.

In relation to this issue of formality vs. informality, Ferreday & Hodgson (2008) point to another thread that derives from large time-gaps between collaboration meetings: the need to renew social ties. By posting to a so-called "'5 minute social' thread" of a forum, the participants should write about anything but academic topics. The initial calling came also from a student:

> "It feels like a very long time since we were all last together - and a very long time until we will be again. Can we take 5 minutes out of academia for a social thread?
> I mean no offence to my current set in any way shape or form, but I'm missing my last set and news from everyone else - on life in general..."
> (Ferreday & Hodgson 2008, p. 645)

With Microblogging, there would be no real gap between meetings, workshops, etc. Members of the network post what they like to post, and they do it *when* they are up to. Furthermore, the effort of setting up and coordinating a learning network would be reduced to a minimum. In the strict definition of CoP, there would not be "a structure to the network and a leader and/or facilitator who manages a rhythm and flow of meetings, stewards content in the shared collaboration spaces, and works behind the scenes to connect people and sustain relationships" (Anklam 2009, p. 418). With Microblogging, a network rather evolves and is coordinated in a self-organised way. Some case studies show that the investments would be very low - technically as well as organisationally (Barnes et al. 2010; Hain, Schopp, Walter 2009; Böhringer & Röhrborn 2009).

Discussion

Firms as members in production networks need to gain highly contextual knowledge about each other:

- transparency about competences other firms possess at a given moment,
- these competences may vary over time due to the extend they acquire experiential knowledge, so competence tracking is crucial,
- transparency about collaborate activities and projects running,
- specific language(s), norms, methods.

The efficiency of such extensive learning processes depends to a large degree on interpersonal and emotional phenomena, such as personal satisfaction, understanding of each other's perspectives, and a feeling of belonging to a group. Such environments fit best to extensive knowledge sharing, as the overwhelming amount of knowledge is highly contextual and cannot be shared without considering the contexts of knowing.

Similar to Communities of Practice (CoP), or by enhancing them, Microblogging technology provides a suitable environment for knowledge creation and sharing in production networks: first, by offering the opportunity to create postings about current activities, new competencies and project issues; second, by offering the

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opportunity to subscribe (and also unsubscribe) to other members' postings. The result is a dynamic, self organising information network that is established as a layer above a temporarily operating production network. Barnes et al. (2010) discovered a case where a company uses a similar system of information sharing for nearly 10 years. Hence this kind of communication is demanded not just since the emergence of Twitter.

As professionals are members of several different Networks of Learning, being part of Microblogging networks would require being part of serveral different technological platforms. Indeed, right now this is a weak point of this kind of technology. Some Microblogging-protocols allow cross-transformations to other platforms. Technical protocols like "Operational Transformation" promise interesting new collaboration possibilities with pub/sub-functions across diverse networks. Google Wave is one of the collaboration software packages that use this protocol.

The emergence of new habits that go along with the emergence of new communication methods will cause new issues that have to be faced. In the realm of Web 2.0, notions like trust, privacy, 'trolling' (i.e. destructive activities in virtual communication, see Donath 1999) or 'lurking' (i.e. refusing participation, see Nonnecke and Preece 2003) are important parameters of virtual communication. As collaborating by the means of social media within the enterprise ("Enterprise 2.0", see McAffee 2006) will become a native research topic for Organisation Science, all these issues will call for consideration.

A culture of transparency and flat hierarchies are the best breeding ground for Microblogging. However, as we have seen in the past with many new forms of collaboration, with Microblogging, the benefits will outreach the risks. There have been, for example, many sceptics about the validity of Wikipedia articles due to incompetency and 'trolling'. This did not stop its success as an information medium. The power of self-organisation has been underestimated by the sceptics. In recent time, further measures have been introduced to face issues in Wikipedia. This is important, because there is innovation in disruptive action, too.

In the near future, we will see similar discussions about Microblogging. It is the task of theorists and practitioners to develop measures in order to minimise risks that arise from destructive forces. There are some studies about the usage of Microblogging in environments of learning and work-based training (e.g. Ebner & Schiefner 2008; Skiba 2008; Ullrich et al. 2008). We assume that in the near future there will occur much more ambitious attempts to incorporate Microblogging to everyday learning processes and hence more studies about this phenomenon.

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