

Understanding personal knowledge management: A weblog case

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Abstract

Much of knowledge management research and practice is focused on an organisational level; interventions and systems are designed and implemented without much thinking of how they would match the practices and daily routines of individual knowledge workers. Personal knowledge management is an approach that complements organisational KM by focusing on ways to support productivity of an individual knowledge worker. The aim of this paper is to propose a personal knowledge management framework by integrating insights from literature on knowledge work and knowledge worker activities with real-life examples of the use of *weblogs* for professional purposes: as personal knowledge repositories, learning journals or networking instruments. We draw upon the results of a weblog adoption study to propose a personal knowledge management framework that maps a knowledge worker's activities across three dimensions: individual, communities & networks, and ideas. We then discuss its implications for research and practice.

Keywords: knowledge work, knowledge worker productivity, personal knowledge management, weblogs

1 Introduction

One of the challenges for modern organisations is to shift from methods of Scientific Management which evolved from Taylor's studies on improving the productivity of manual workers, to new management approaches that address the increasingly knowledge-intensive nature of work (Drucker, 1999). Knowledge Management (KM) as a field is both the product and the driving force of this change: improving knowledge worker productivity is one of the core KM goals (Wiig, 2002; Schütt, 2003).

However, much of knowledge management research and practice is focused at the organisational level, aiming to develop an environment where knowledge is created, shared and used, as well as implementing specific interventions that support these processes. In many companies, because "no one seems to own the problem of knowledge-worker performance" (Davenport, Thomas, & Cantrell, 2002: 25), the personal side of KM is often neglected: interventions and systems are designed and implemented without thinking about how they would match the practices and daily routines of individual knowledge workers. As a result, knowledge workers often perceive new KM activities as an overhead instead of making work easier (Davenport & Glaser, 2002).

While the personal side of knowledge management seems to be neglected in corporate KM initiatives it has increasingly become a topic of discussion by KM practitioners. For example, The Association of Knowledge Work, one of the most vibrant KM communities, hosted several STAR Series conversations discussing personal knowledge management (PKM)¹. There is a growing number of business publications on personal knowledge management (e.g. Barth, 2000, Higgison, 2004), but this topic hasn't gained much attention in the scientific community. This could be explained by its multidisciplinary nature that would require, for example, establishing connections between research on personal information management (e.g. Landsdale, 1988) and networking (e.g. Nardi, Whittaker, & Schwarz, 2002).

This paper proposes a personal knowledge management framework that supports a multidisciplinary view on knowledge work. Such a framework requires a holistic approach that

accounts for the diversity of a knowledge worker's activities and their interconnections, which this paper provides through the study of weblogs as used for professional purposes.

Weblogs are often defined as personal 'diary-like-format' websites enabled by easy-to-use tools and open for everyone to read. Though the average public weblog is a personal diary, mostly of interest for its author's family and friends (Henning, 2003), there is a growing cluster of weblogs used by professionals in different domains. One can find, for example, *medlogs* (weblogs about health and medicine), *blawgs* (law-related weblogs), *edublogs* (educational weblogs) or *knowledge management weblogs*². In a professional context a weblog can serve as a personal knowledge repository, a learning journal or a networking instrument. It provides its author with a personal space in public and enables connections with others.

Being both confessional and public, professional weblogs provide a researcher with a window into a knowledge worker's world, revealing usually invisible traces of developing ideas and relations with others, thus creating an opportunity to understand how different activities connect into a whole.

In this paper we argue that existing knowledge management approaches often focus on supporting knowledge creation and sharing organisation-wide and do not take into account how different initiatives and activities connect at the level of the individual knowledge worker. We introduce personal knowledge management as an approach that focuses on supporting knowledge worker productivity by taking an actor perspective in analysing knowledge work. After introducing weblogs, we discuss our approach of using them as a case for studying knowledge worker activities and then present the results, illustrating and discussing weblog use to support knowledge work based on the findings of a weblog adoption study. Finally, we integrate our results with insights from the literature, propose a personal knowledge management framework and discuss implications of this study for research and practice.

2 Background

2.1 Personal side of knowledge management

In knowledge-intensive environments, employees can best be described as *investors* whose capital is the expertise they bring into a company (Stewart, 1998; Davenport, 1999; Kelloway & Barling, 2000). Like any investor, they want to participate in decision-making and can easily withdraw if their 'return on investment' is not compelling. Creativity, learning and the desire to help others cannot be controlled, so knowledge workers need to be intrinsically motivated to deliver quality results. In this environment 'command and control' management methods are not always effective.

Kelloway & Barling (2000) define *knowledge work* as *discretionary behaviour* (a system of activities that knowledge workers opt to do) and managing knowledge work as establishing conditions that increase the likelihood of making the 'right' choices:

As such knowledge work is understood to comprise the creation of knowledge, the application of knowledge, the transmission of knowledge, and the acquisition of knowledge. Each of the activities is seen as discretionary behavior. Employees are likely to engage in knowledge work to the extent that they have the (a) ability, (b) motivation, and (c) opportunity to do so. The task of managing knowledge work is focused on establishing these conditions. Organizational characteristics such as transformational leadership, job design, social interaction and organizational culture are identified as potential predictors of ability, motivation and opportunity (Kelloway & Barling, 2000: 287).

Although similar frameworks are developed by other authors (e.g. Keursten, Kessels, & Kwakman, 2003; Schütt, 2003), they remain focused at the organisational level, examining factors, conditions, and interventions that empower and guide knowledge work, rather than indicating how knowledge workers can organise their own work. This individual need to take

control over knowledge work and supporting activities is reflected in the practitioners' definitions of personal knowledge management:

Definitions of PKM revolve around a set of core issues: managing and supporting personal knowledge and information so that it is accessible, meaningful and valuable to the individual; maintaining networks, contacts and communities; making life easier and more enjoyable; and exploiting personal capital (Higgison, 2004).

Focusing on the individual, personal knowledge management complements more common approaches of studying specific tasks that knowledge workers perform (see Schultze, 1999 or Burstein & Linger, 2003 for examples) with an overview of supportive activities, such as organising personal information sources or developing personal networks, and their interdependencies. From this perspective, personal KM could be also defined as managing a *one-person enterprise* – the knowledge worker's expertise, any 'knowledge products' that he produces, his processes, his tools, and his relations with partners, customers and suppliers – and connected with literature on personal effectiveness and time management (e.g. Covey, 1990) or personal branding and networking (e.g. Cope, 2002).

2.2 Weblogs

Weblogs (also called *blogs*) are not easy to define in one sentence. Most authors agree that a weblog is "a frequently updated website consisting of dated entries arranged in reverse chronological order" (Walker, 2003), but then discuss specific characteristics that make weblogs different from other forms of webpublishing (e.g. Winer, 2003). The difficulty of defining weblogs has something to do with the fact that their authors have different goals, uses, or writing styles with only one thing in common: format. Said more poetically, "Weblogs simply provide the framework, as haiku imposes order of words" (Hourihan, 2002).

The typical *weblog tool* works as a lightweight content management system. It keeps a database of text entries (and other content such as pictures or sound files), supports adding and editing of items, and simplifies publishing to the Web by processing content through a set of pre-defined templates holding all the formatting information for a particular visual presentation. Simple weblog systems only provide a chronological organisation of entries (usually referred to as posts), however more advanced systems also support organising entries into categories or labelling them with additional meta-data such as keywords and topics.

Many weblogging tools not only generate HTML pages, but also encode their published content in an XML-based format known as RSS (Really Simple Syndication). These RSS encoded content feeds can be harvested by so-called *news aggregators* (also known as RSS readers). These programs automatically check subscribed weblog feeds for updates and display any new content. In this way readers can easily keep up with many weblogs (and an increasing number of other websites), without the burden of navigating the actual web pages. Next to providing an easy way to follow a large number of sources, a growing adoption of news aggregators makes regular reading of a weblog more likely: someone subscribed to a weblog via its RSS feed is constantly reminded to come back as new posts appear in their RSS reader.

However, what makes weblogs different is not the publication of content *per se*, but the personalities behind them. Weblogs are increasingly becoming the *on-line identities* of their authors. Most weblogs are not formal, faceless, corporate sites or news sources: they are authored by individuals (known as webloggers or bloggers), and perceived as 'unedited personal voices' (Winer, 2003).

Often a weblog is written as a narration of its author's thoughts and feelings (Walker, 2003); (Herring et al., 2004), allowing personality and values to emerge from the words. Even weblogs that are little more than collections of links and short commentaries say something about their authors. The selected content a weblog author finds interesting enough to link to and to comment on functions as a public record of personal interest and engagement.

There is an ongoing debate in the weblog research community over how interactive an average weblog actually is (e.g. Herring et al., 2005). Nevertheless there are indications of the development of weblog conversational practices (e.g. Efimova & de Moor, 2005) and community-forming effects of blogging (e.g. Merelo-Geurvos et al., in press; see also section 3.3 for more details).

2.3 Using weblogs to understand personal knowledge management

Since their early days, weblogs have been envisioned as a prototype technology for enabling grass-roots knowledge management (Nichani & Rajamanickam, 2001; Bausch, Haughey, & Hourihan, 2002; Röll 2003), triggering discussions about *k-logs* (or *knowledge logs*), which are weblogs used by an expert or employee "to publish insight, a point of view (POV), links to resources, important documents and e-mails with annotation, and other thinking to an intranet where it can be archived, searched, and browsed" (John Robb in Bausch, Haughey, & Hourihan, 2002). They are also increasingly used for knowledge development and sharing in companies (e.g. Bushell, 2004) or in academia (Mortensen & Walker, 2002; Paquet, 2003). These uses inspire thinking about future development of technologies to provide individuals with easy ways to organise their knowledge and connect with others (Edmonds, Blustein, & Turnbull, 2004; Ohmukai, Takeda, & Numa, 2004), and thinking about reshaping organisational practices to support distributed knowledge management (Röll, 2004).

Weblogging tools are flexible enough to be used in a variety of ways and their uses in professional contexts suggest that they address specific needs of knowledge workers. In this paper we use weblogs as a looking glass to explore those needs and to identify activities of knowledge workers. We choose this case because: (a) weblogs make visible many knowledge work activities that are usually hidden, (b) these activities occur in a public space, making them available for examination, and (c) because weblogs allow researchers to study individuals without losing sight of their social context. Weblogs provide unique opportunities for observing trails of developing ideas and relations with others, and the interplay between individuals and communities in this process.

In the following section we draw on the results of a study of weblog adoption to detail various knowledge worker activities supported by weblogs, combining them with insights from other weblog studies as well as reflections from the 'knowledge management and learning' weblog community to which the author belongs.

3 Knowledge worker activities supported by weblogs

3.1 Findings from a weblog adoption study

To illustrate how weblogs can support knowledge work we use the insights of a study focused on understanding factors supporting weblog adoption (Efimova, 2003). During this study, 62 bloggers and 20 people thinking of starting a weblog completed a qualitative on-line questionnaire about their motivation to have a weblog, as well as the context, technology and personal characteristics that they thought supported blogging. Although the sample was not representative enough to draw conclusions about weblogs in general, it clearly illustrates a variety of knowledge worker activities supported by weblogs.

Below we summarise the study findings related to questions about the motivation and values of bloggers, about job characteristics that support blogging, and situations that prompt writing to a weblog. These findings are illustrated with selected quotes from the study respondents (spelling, grammar and punctuation are preserved).

Respondents were asked about their *motivation to start a weblog* (Table 1). Many of them started blogging out of curiosity, as an experiment or having been encouraged by others. However some stated explicitly that they wanted to organise ideas and references or improve

learning. Starting a weblog was also driven by an interest in communication and sharing or a need for expressing and publishing ideas.

Table 1. Examples of responses about motivation to start a weblog

Why did you start your weblog? What motivated you?

Respondent A: Out of curiosity. Saw some people do it, wanted to experience for myself if it was worthwhile. And because it seemed like I had been blogging for years on paper: taking notes, jotting down ideas. It seemed an interesting experiment to try that on line.

Respondent B: I was sharing my knowledge in various mailing-lists. I thought by publishing them at one place things have more value for me

Respondent C: I had recently completed a Masters degree and wanted/needed an outlet for continued thinking.

Respondent D: To be able to share ideas. Also, writing helps to improve ideas and thinking as you have to articulate yourself to others.

These results are interesting to compare with the bloggers' responses regarding *added values of blogging discovered after starting it* (Table 2). Some bloggers discovered that blogging helps improve their knowledge and skills (e.g. technology-related skills, writing, discipline, being organised, ability to pose questions, and ability to distinguish between public and private). Others find that the serendipity, feedback and dialogues that emerge between bloggers contribute to sharing, evaluating and developing their own ideas. Many respondents observe social effects of blogging: amplified networking relation building, finding people with similar interests new friends, and community-forming. Some note that after starting to blog they found an audience and an easy way to promote their ideas.

Table 2. Examples of responses about weblogging values discovered after starting a weblog

What other added values of blogging did you discover after starting it (if any)?

Respondent A: 1) That ideas can turn into new relationships and social networks. 2) That I get praise for writing good stuff, or criticism for bad stuff, even if I myself wasn't sure about its worth: it's a sort of test, am I crazy, or is this a good thing. Especially when there are no others in your own organization working in the same field. 3) The dialogues that come from posting.

Respondent E: The increasing network of easily reachable "intelligent" people

Respondent F: The main thing that has surprised has been the depth of the information that is available in the individual blogs.

Respondent G: thinking in public is valuable and something I am learning; also the ability to distinguish between different public and private scopes

Respondent H: networking, building personal credibility, getting in touch with friends I had lost contact with, learning a lot of new stuff through reading other blogs

Respondent I: meeting new people with similar (and also different opinions... being open and learning to know myself better while others get to know me too

The answers about *job characteristics that support blogging (Error! Reference source not found.)* fall into three groups. First, weblogging fits well with jobs focused on technology or weblogs: IT-related professions or any other job that requires studying or using technology in general or weblogs in particular for learning, collaboration or knowledge sharing. Second, weblogs are well supported by jobs that require trend-watching, collecting and aggregating information, making notes or other writing. They also fit well if there is a need for collaboration, sharing and feedback, or need for exposure and 'selling ideas'. Finally, blogging fits working environments that offer the freedom to communicate, time, and an Internet connection.

Table 3. Examples of responses about job characteristics that support blogging

Which characteristics of your job support blogging?

Respondent D: Collaboration with others and the sharing of ideas. Also, writing and documentation is a regular part of my job. As an academic I have to write journal articles so writing for a wider audience in my weblog is a natural extension of that.

Respondent F: I am a collector of ideas and information and have found that a byproduct of blogging is a roadmap of my interests.

Respondent H: Knowledge-driven job; blogging has become "backup brain" for job-as well as personally-interesting links and notes. Posting job-related questions on the blog has yielded valuable feedback from readers

Respondent J: I spend a lot of time on research, so my blogging is partly recording opinions/information/insights/sites I find interesting and partly using the act of writing the blog to clarify my thinking on various topics.

We also asked bloggers about *situations that prompt writing* in their weblog. The motivation behind posting on a topic may include: capturing and organising information and ideas for oneself or others; clarifying ideas or concepts, articulating ideas to understand them; contributing to the development of an idea by commenting or by connecting it to other ideas; starting a conversation, looking for feedback.

These examples suggest that weblogs can support many of the activities of a knowledge worker. Of course, they are only an illustration: we do not imply that all weblogs are used this way or that they allow observing all the components of knowledge work. However, the image of knowledge work that weblogs highlight is much richer than existing models and can serve as a starting point for in-depth exploration. In the following sections we reflect on the examples presented above by exploring blogger activities along two lines: developing ideas and developing relations with others.

3.2 Developing ideas

Although developed as tools for easy publishing to the Web, weblogging tools are flexible enough to be used in a variety of ways. They have proven to serve as an instrument for filtering and organising information, and for articulating, developing and sharing ideas (for example, use of weblogs in research, (Mortensen & Walker, 2002). Below we build on existing research and weblog discussions to propose a number of bloggers' activities related to developing ideas.

Finding ideas/information. Reading the weblogs of others with similar interests helps to filter ideas and discover pointers to interesting resources: a link from a weblog serves as a personal recommendation and it is usually accompanied by a comment that helps to identify its quality. This peer-filtering mechanism of weblogs is often compared with references in scholarly publications (Mortensen & Walker, 2002; Paquet, 2003). Avid weblog authors can become 'human information routers' for like-minded readers.

Capturing, articulating and organising ideas. As single-user content management systems, weblogs are used for capturing ideas from the outside world, recording insights for future use or articulating one's own ideas in order to understand them better. Weblogging tools increasingly offer opportunities for categorisation, allowing retrieval of old posts via topic-based archives as well as chronological ones. Although far from providing full functionality, weblogs are used as personal information management tools: storing and organising notes for future retrieval.

Initiating and following conversations. Weblogs are used to develop ideas not only at a personal level, but also through dialogues with others. Most weblogging tools provide commenting functions so that each weblog post can serve as a trigger for a conversation with regular readers of a weblog or random web surfers, similar to a forum discussion.

A more sophisticated conversational form is *distributed weblog conversations*. Rather than commenting directly, many weblog authors prefer to comment within their own blogs while providing a link to the original post. This results in discussions scattered across many weblogs, also known as *blogologues* or *blogosphere stories* (Jenkins, 2003). Such conversations tend to branch into multiple paths and can often be difficult to track and follow. However they are also not restricted to a specific audience, making serendipitous inclusion of new participants possible, thus contributing to an original idea in unexpected ways (Efimova & de Moor, 2005).

3.3 Developing relations with others

Weblog conversations do not only support the development of ideas, but also the development of *relations* with others. Although linking to others is explicit, the process of developing relations via a weblog is easier to experience than to observe as an outsider. This probably explains why, in the study described above, few respondents started a weblog to develop new connections, but many noticed the social effects of blogging after writing for some time.

Specific characteristics of weblog communities still have to be identified, but a limited number of existing studies confirm that weblogs do support community forming (Asyilkina, 2003; Nilsson, 2003), establishing relations across communities (Aïmeur, Brassard, & Paquet, 2003), and conversational learning (Fiedler, 2003). The growing popularity of on-line networking tools (see boyd, 2003, for an example) provoked a round of discussions among bloggers about weblogs as networking instruments (for example, Mehta, 2004). Below we build on existing research and weblog discussions to propose a number of bloggers' activities related to developing relations with others.

Self-representation and leaving traces. As we already noted, in many cases weblogs serve as an online representation of their authors. Professional weblogs are often compared with or used as "living" business cards. Probably the best-known example of this is the story of Robert Scoble, who got hired by Microsoft as a result of writing a weblog:

“My boss said this was the first time he hired somebody and knew exactly what he was getting,” he [Robert Scoble] said. “People know everything about me from my blog. It's like a business card. Even if you're a plumber and you do a Weblog, I imagine you're going to get a lot of different job offers.” (Ankeny, 2003)

Being aware of another person's knowledge and experience is a prerequisite for effective knowledge sharing (Cross et al., 2001). Although not every weblog author receives job offers, weblog posts provide visible traces of a blogger's expertise, thus serving as a starting point for initiating knowledge-sharing connections with others.

Finding experts and cross-disciplinary connections. Many weblogs display a *blogrolls*, a list of weblogs that their author reads regularly. Through these lists, occasional readers can find trusted 'sources' that influence the thinking and writing of a particular weblog author. These links are not only referrals, but also *signs of value* and *personal recommendation*, enabling others to find relevant contacts faster. As the personal interests of a blogger can vary a lot, these recommendations are not necessarily limited to one specific area. Compared to closed professional associations, publications or conferences, the open nature of weblogs supports the establishment of *cross-disciplinary connections* (Aïmeur, Brassard, & Paquet, 2003) that fuel the development of innovative ideas.

Developing, maintaining and activating connections with others. Personal relations need constant work (netWORK, "an ongoing process of keeping a personal network in good repair" according to Nardi, Whittaker, & Schwarz, 2002: 9). Regular reading of particular weblogs often functions as a seed for developing more personal relations between weblog authors. In addition to supporting the establishment of new connections, weblogs help to maintain existing connections: regular reading of a weblog supports continued awareness of that authors thinking and progress, allowing them to 'stay on the radar'. A weblog can also reduce the burden of

finding someone's contact information, as most weblog authors provide various means (e.g. e-mail address) to contact them.

4 Towards a personal knowledge management framework

The activities described in the previous section are not unique to those writing or reading weblogs. Filtering relevant information, organising one's ideas, and connecting with others to develop them further are increasingly becoming a part of any work in a knowledge-intensive environment. However, studies have indicated that, unlike physical work, knowledge work is often invisible. The 'iceberg' metaphor is used in studies of informal and incidental learning to describe the 20/80 ratio between learning in formal settings (e.g. taking courses) and learning informally, which most people do not even consider as learning (Center for Workforce Development, 1998). Personal relations are vital for sharing knowledge (Cross, Parker, Prusak, & Borgatti, 2001), but the time spent building and maintaining personal networks is hardly ever taken into account (Nardi, Whittaker, & Schwarz, 2002). In most cases one can only observe the products of knowledge work (reports, designs, decisions made, etc..) but not the process of creating them (Drucker, 1999; McGee, 2002).

Much of this work – finding, interpreting and connecting relevant pieces of information, negotiating meanings, eliciting knowledge in conversations with others, creating new ideas and using them to come up with a final product – happens in the head of a knowledge worker or embedded as part of communication or doing work. The public nature of weblogs provides an insight into these practices, although, of course, there is still much left invisible.

In this section we integrate insights from the study above as well, as existing literature, and propose a personal knowledge management framework (see Fig.1). We suggest that a knowledge worker's activities could be mapped as interactions of an individual (1) both with other people (2) and with ideas (3).

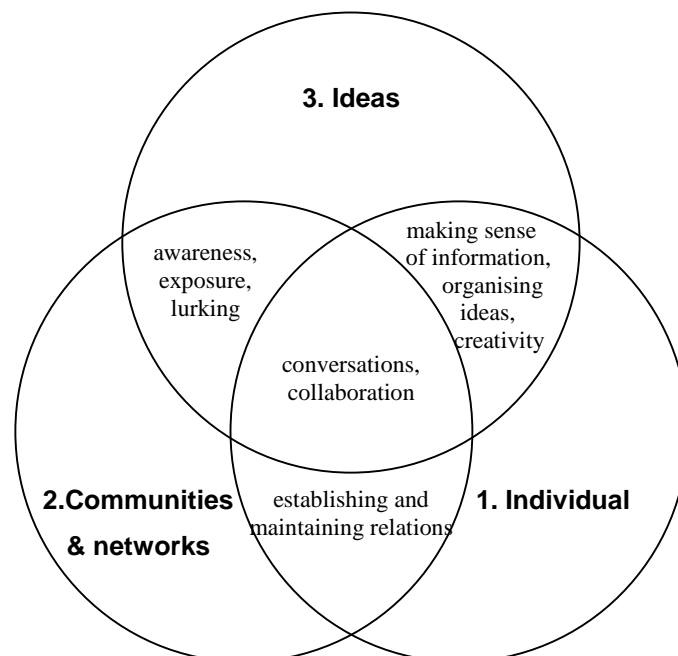


Fig.1. Personal knowledge management framework

New ideas and insights are often developed in the social context (Lave & Wenger, 1991; Brown & Duguid, 1996), hence *conversations and collaboration* are in the middle of the framework.

Conversations also require unique *personal contributions*, enabling *relations* between participants, as well as *awareness* of a specific domain, its players and social norms.

Participation in conversations in any community requires learning to move from being an outsider to a more active position through participation at the periphery (*legitimate peripheral participation*, according to Lave & Wenger, 1991). Awareness, as a starting point of this process, comes through *exposure* to the ideas of others and *lurking* (observing without active participation) in order to learn about professional language and social norms (MacDonald et al., 2004). Research on lurking suggests that it is a more common activity than active participation in conversations (Nonnecke & Preece, 2003), but its effects are only starting to be explored.

On one hand effective knowledge development is enabled by trust and shared understanding between the people involved. For an individual, this means a need to *establish and maintain a personal network* (Nardi, Whittaker, & Schwarz, 2002), to keep track of contacts and conversations (Whittaker, Jones, & Terveen, 2002), and to make choices about which communities to join and which to ignore.

On the other hand developing knowledge requires *filtering* vast amounts of information, making sense of it, and *connecting* different bits and pieces to come up with new ideas. In this process physical and digital artefacts play an important role (Kidd, 1994; Sellen & Harper, 2001; Halverson, 2004), so knowledge workers are faced with a need for *personal information management* (Landsdale, 1988) to organise their paper and digital archives, e-mails, and bookmark collections.

The framework we propose illustrates a need for a multidisciplinary approach to understanding knowledge workers. Existing approaches address one or two dimensions and rarely take into account their connection with the rest. For example, research on knowledge sharing in communities of practice often fails to address the needs and activities of an individual knowledge worker, while studies on personal information management do not always take into account the social context of knowledge creation.

Existing fields focus on specific activities, leaving the problem of integrating them in a coherent whole to knowledge workers themselves. We believe that a more promising approach can be found in understanding what personal knowledge management is: what a knowledge worker, as an actor, needs and how processes and technologies can be modified and aligned to improve his productivity.

5 Conclusions and implications

In this paper we argue that existing knowledge management approaches often focus on supporting knowledge creation and sharing organisation-wide, and do not take into account how different initiatives and activities connect at the level of an individual knowledge worker. We introduce personal knowledge management as an approach that focuses on supporting knowledge worker productivity by taking an actor perspective in studying their work. Then we look at the use of weblogs as a way to identify the activities of a knowledge worker and their relations, presenting and discussing the results of a weblog adoption study.

The examples we provide do not exhaust all possible knowledge worker activities, but they suggest a more complex image of knowledge work than existing models acknowledge. We use the results of this exploration to propose a personal knowledge management framework that maps a knowledge worker's activities across three dimensions: individual, communities & networks, and ideas.

Although it needs further refining and validation (in non-weblog contexts) this framework provides a holistic view of the complexity of managing a knowledge worker's *one-person enterprise*. By focusing on an individual it shows that knowledge work is comprised of more than the specific tasks knowledge workers perform. This integrated perspective facilitates

reflection on existing support for knowledge work. It could be useful for a knowledge worker picking and mixing personal productivity techniques and tools, as well as for an organisation integrating different KM projects and systems. For technology developers it can indicate directions for creating tools that allow flexibility and seamless integration of multiple uses (as contrasted with the current generation of tools which are highly specialised, but not well connected; for more on this approach see De Michelis, 2003).

The framework brings to light knowledge worker activities (e.g. developing and maintaining a personal network) that are often invisible, not supported, and not accounted for, thus creating awareness that could be a starting point for changes necessary to improve knowledge worker productivity. It also indicates that knowledge work has components that are beyond organisational control, implying that responsibility for knowledge worker productivity is shared between the individuals and the organisation they work for. This is a challenge for both sides. Companies would have to recognise that their employees are not simply 'human resources', but investors, and learn how make workplaces rewarding, so employees bring their expertise in and make good use of it. For knowledge workers it requires taking responsibility for their own work and learning (which entails an attitude shift and a desire to take the initiative), as well as developing personal KM knowledge and skills.

This personal knowledge management framework can serve as a basis for multidisciplinary research on knowledge work: providing a way to connect insights about knowledge worker activities and ways to support them from different fields. This study also indicates the potential of weblogs as a 'looking glass' that helps to study knowledge work, which may be interesting not only for follow-up research, but also as a research instrument in other studies.

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¹ Conversations with David Gurteen "IPKM: Inter-Personal Knowledge Management" (http://www.kwork.org/Stars/gurteen_conversation.html), conversations with Dave Pollard "Weblogs and Other Social Software for Knowledge Work" (http://www.kwork.org/Stars/pollard_conversation.html), conversations with David Snowden and Steve Barth "Comparing and Contrasting Corporate and Personal KM" (http://www.kwork.org/Stars/barth_snowden.html).

² Collections of weblogs in each domain could be found at www.medlogs.com, www.blawg.org, www.ebn.weblogger.com and www.voght.com/cgi-bin/pywiki?KMBlogger respectively.