

7-1-2013

# Freedom Of Choice: Perspectives On Personal Workspaces

Michael Kohlegger

*University of Innsbruck, Innsbruck, Tirol, Austria, michael.kohlegger@uibk.ac.at*

Ronald Maier

*University of Innsbruck, Innsbruck, Tirol, Austria, ronald.maier@uibk.ac.at*

Ulrich Remus

*University of Innsbruck, Innsbruck, Tirol, Austria, ulrich.remus@uibk.ac.at*

Follow this and additional works at: [http://aisel.aisnet.org/ecis2013\\_cr](http://aisel.aisnet.org/ecis2013_cr)

---

## Recommended Citation

Kohlegger, Michael; Maier, Ronald; and Remus, Ulrich, "Freedom Of Choice: Perspectives On Personal Workspaces" (2013). *ECIS 2013 Completed Research*. 139.

[http://aisel.aisnet.org/ecis2013\\_cr/139](http://aisel.aisnet.org/ecis2013_cr/139)

This material is brought to you by the ECIS 2013 Proceedings at AIS Electronic Library (AISEL). It has been accepted for inclusion in ECIS 2013 Completed Research by an authorized administrator of AIS Electronic Library (AISEL). For more information, please contact [elibrary@aisnet.org](mailto:elibrary@aisnet.org).

## **FREEDOM OF CHOICE: PERSPECTIVES ON PERSONAL WORKSPACES**

Michael Kohlegger, University of Innsbruck, Universitaetsstrasse 15, 6020 Innsbruck, Austria, michael.kohlegger@uibk.ac.at

Ronald Maier, University of Innsbruck, Universitaetsstrasse 15, 6020 Innsbruck, Austria, ronald.maier@uibk.ac.at

Ulrich Remus, University of Innsbruck, Universitaetsstrasse 15, 6020 Innsbruck, Austria, ulrich.remus@uibk.ac.at

### **Abstract**

*Knowledge work support is crucial for many organizations. Knowledge work is less structured and routinized, dynamic and in need of support by information and communication technologies. Knowledge workers are, therefore, often granted substantial freedom of choice for self-organization with respect to their personal workspace, intended to enhance their effectiveness, creativity and productivity. What remains unclear is how knowledge workers use this freedom of choice to organize their personal information resources and aids for work – their personal workspaces. How do personal workspaces look like, how are they used by their creators to fulfil their tasks and what effects does their use have on knowledge work productivity? In this paper, we present the findings of an in-depth study employing interpretative research based on a series of 27 interviews with nine knowledge workers. We present four perspectives on personal workspaces: (1) archive, (2) perpetual beta, (3) personal branding and (4) territory. These perspectives can help to understand how knowledge workers use their personal workspace, to discuss personal workspace use from different viewpoints and to stimulate further empirical research by building the necessary ground for research into knowledge work support.*

*Keywords: personal workspace, monitoring, knowledge work, qualitative interviews*

## 1 Introduction

Organizations have been using personalization strategies for years as powerful instruments to “provide creative, analytically rigorous advice [...] by channeling individual expertise” (Hansen et al., 1999, 109). In particular, knowledge workers (KWs) – persons who are engaged in work with a low level of standardization that addresses symbols and abstract knowledge (Pyöriä, 2005) – are managed under the paradigm of personalization, being granted a high degree of self-leadership responsibility (Pearce & Manz, 2005, 133), as a response to the bottom-up demands of this workforce (Pearce & Barkus, 2004, 47).

By pursuing a personalization strategy, organizations are providing substantial freedom of choice to their employees, who organize themselves de-centrally. Letting KWs choose, configure or develop their own solutions with respect to information and communication technologies (ICT) is, for example, a critical issue for many organizations and is commonly intended to yield higher productivity in the execution of their professional tasks (Davenport et al., 2002, 28). As a result, KWs are given a certain freedom of choice with respect to artifacts that they want to use to do their work. We will further refer to the self-organized arrangement of artifacts – information containers and access technologies – as personal workspace (PWS). We refine this definition based on our findings in Section 4.

What remains unanswered is, however, how KWs use this freedom of choice with respect to their PWS and how their work is effected by this use, for instance, in terms of effectiveness, creativity and productivity concerning the tasks they need to fulfil. This research gap has been acknowledged in past research calling for future work on KWs’ strategies with respect to technology gaps (Bailey & Konstant, 2006, 728) and increased access to data and new technology (Davis, 2002, 73) as well as the integration and governance of KWs’ self-made applications in corporate settings (Cherbakov et al., 2007, 18). In particular, it is unclear how the results of self-organization – the actual PWS – look like. Hence, this paper addresses the research questions: how do knowledge workers self-organize artifacts and what roles do the resulting PWSs play in their work?

Using an interpretive lens we conducted in-depth interviews with KWs, who are granted different levels of choice with respect to organizing their PWS. In particular, we analyzed these interviews for the perspectives that our interviewees have attached to their PWS and the way these PWSs are used. As a result, we were able to uncover the ways KWs see their own PWS arrangements in the context of their work. Our paper is structured as follows: After this introduction, we discuss the core concepts of our work (Section 2), explain our study’s approach (Section 3), present our results (Section 4), discuss our findings (Section 5) and give implications of our work (Section 6).

## 2 Foundation

Individuals in the context of KW are engaged in ill-structured and creative work, mostly handling abstract knowledge, being in need of strong, formal education, socialization and on-the-job learning, facing a low level of standardization of work and producing as well as consuming information (Drucker, 1959; Kelloway & Barling, 2000; Pyöriä, 2005, 124; Schultze, 2004, 46). In addition to that, they often require strong and flexible support with ICT and organize themselves in a self-directed manner (Maier, 2007, 46-47). Knowledge work shows conceptual overlaps with other concepts such as creative worker (Greenberg, 1992, 75). The term knowledge work has been coined by Drucker (1959, 69) and has both, proponents and opponents. It has been skeptically discussed for its potentially discriminating momentum (Schultze, 2004, 55) and the role of ambiguity, rhetoric and image construction (Alvesson, 2001, 876). Therefore, it is suggested to understand knowledge work as an ideal-type concept of work (Pyöriä, 2005, 123-124).

Alongside the defined characteristics, knowledge work has been described with a focus on work practices and thus on what people *do* rather than on what they *know* (Blackler et al., 1993). This activity-oriented perspective has been repeatedly used to study knowledge work, for instance, as knowledge processes (Davenport et al., 1996) or as knowledge manipulation episodes (Holsapple & Jones, 2004).

Examples for knowledge activities are acquiring, creating, gathering, organizing, packaging, maintaining, systemizing, communicating and applying knowledge (Davenport et al., 1996; Holsapple & Whinston, 1987, 87; Kelloway & Barling, 2000). Some of the collections of activities were found in profound qualitative studies such as the four practices *ex-pressing*, translating, monitoring (Schultze, 2000) and networking (Knights et al., 1993), and are, thus, a well described and valuable starting point for new research as ours. *Ex-pressing* is the activity of knowledge extraction into words and linear texts, which aims at objectifying this knowledge to a larger audience. *Translating* is the knowledge translation activity aiming at transferring knowledge from one domain into another. *Monitoring* is an information gathering activity, conducted unobtrusively to get a wide variety of just-in-case information on a continuous basis (Schultze, 2000, 19). *Networking* is, finally, the expressing of knowledge relations between actors aimed at disseminating, legitimizing and solidifying the individual's reality.

Knowledge work is not principally bound to the use of technology (Pyöriä, 2005, 122), but might benefit from a strong, but flexible support with ICT (Maier, 2007, 47). There are already some conceptions of technology available for the context of knowledge work. Some of them are, for example, knowledge building environments (Scardamalia & Bereiter, 2003), authentic learning environments (Gulikers et al., 2005) or task tracer environments (Dragunov et al., 2005).

These environments use a combination of ICT in the form of resources, which contain information and methods, which are used to tap these containers. This could, for instance, be persons communicating with the help of a virtual notice board (Scardamalia & Bereiter, 2003, 5), multimedia sources that are accessed by a software program (Gulikers et al., 2005, 512) or an event database that is accessed by a search algorithm (Dragunov et al., 2005, 77).

We will use the term PWS to refer to individuals' perspectives on their self-organization of potentially accessible and adaptable information containers as well as information technologies that are used to tap these containers. Self-organization means here that the individuals have invested some perceived composition effort to shape the containers and/or technologies according to their ideas. The notion of technology is not bound to computer technology, but rather addresses all means that are used for conduction of work, no matter if they are attached to the use of a computer or not. We focus our investigation on PWSs that are used by knowledge workers to support professional activities in organizational settings.

### 3 Methodology

Our epistemological position is that scientific knowledge comprises facts and values, which are hard to disentangle (Archer, 1988, 273). We have used an interpretative approach (Myers & Walsham, 1998) to guide our research. Our *data collection* aimed at revealing deep insight into the focused phenomenon of PWS organization. One of the authors conducted 27 in-depth interviews between October 2011 and July 2012. These involved nine interviewees with three interviews each.

We have limited our focus in data collection to the particular knowledge work activity of monitoring, as it has been described for knowledge work and is mostly independent of the particular job description. Hence, monitoring can be found in various job contexts like higher management (Cousins & Robey, 2005, 166), clerical activities (Schultze, 2000, 17) or research (Mårtensson & Lee, 2004, 515).

We conducted three consecutive sessions involving semi-structured interviews (Miles & Huberman, 1994, 34-37). We used *appreciative interviews* (Schultze & Avital, 2011, 6-8) in our first session. These are especially applicable to research situations in which the researcher aims to create a trusted atmosphere to encourage the interviewee's participation (Kolb, 1984, 103-106). We divided these interviews into a retrospective and a prospective part (Avital, 2003, 6-7), where we tried to shed light on each interviewee's current and desired PWS situation with respect to monitoring. These interviews resulted in rich descriptions of our interviewees' work context. We then used *graphic elicitation interviews* (Crilly et al., 2006) in a second session, employing diagrams to assist the interviewees' descriptions of their PWSs that helped to transfer complex social experiences (Mason, 2006, 10). We asked our interviewees to use the already addressed PWS elements, extend them with missing ones and arrange them on a sheet of paper, putting those elements with the highest 'inner presence' near the center and less

important elements further away from it. The interview subsequently focused on this diagram. These interviews resulted in comprehensive descriptions of PWS arrangements. We finally used *laddering interviews* (Reynolds & Gutman, 1988) in a third session, which aimed at uncovering the values attached to PWS arrangements by repeatedly asking, why some PWS elements were important to the interviewee. This process started with a set of element attributes that were identified through a sorting process. We used triadic sorting to uncover all bi-polar oppositions (Kelly, 1992, 154-155) between the most central PWS elements of each interviewee. The resulting means-end chains departed from these attributes and yielded consequences and values attached to them. The probing was done until the interviewee could not come up with any new answers (Sørensen & Askegaard, 2007, 65).

**Data analysis** started with transferring all interviews into written format, resulting in approximately 27 hours of recorded material and 590 pages of transcript. We used *open coding* to conceptualize emerging phenomena from the textual material (Strauss & Corbin, 1990, 61). These were describable incidents upon which a set of actions were directed (Strauss & Corbin, 1990, 96). The coding procedure was closely attended by *constantly comparing* concepts amongst each other (Glaser, 1965). In a second phase of coding, we moved further towards *axial coding* – the process of putting back and forth the results of open coding together in new ways to reveal more general concepts (Strauss & Corbin, 1990, 96). This process was dominated by combining, regrouping and renaming of concepts into more generic categories. Again, this required constant comparison to ensure consistency in the resulting high-level categories (Glaser, 1965). These categories were used to describe the structure of each interviewee’s story. They marked the different stances that interviewees’ took with respect to their PWS. With respect to this general metaphor of *viewing* PWSs, we have labelled these stances *perspectives*. We will describe each perspective in the upcoming section. The whole coding process was accompanied by writing memos (Miles & Huberman, 1994, 72-75).

**Sampling** was done on the account of conceptual considerations. This aimed at being able to compare and contrast the responses of our interviewees with respect to their contexts (Kuzel, 1992, 43). We decided to ask for (1) at least one year of employment in the respective profession, (2) the occupation of a computerized workplace and (3) the will to participate in all three stages of the study as minimum requirements for a person to be selected as an interview partner. For the purpose of initiating interviews, we had a list of twenty potential interview partners, which we could make a contact to. These contacts were either personally known or had been recommended by other persons. This approach of asking ‘well-situated people’ for potential interview partners is a typically sampling approach in qualitative research (Faugier & Sargeant, 1997, 792; Patton, 2002, 237).

<i>Inter-viewee</i>	<i>Job title</i>	<i>Organization sector*</i>	<i>Organization size*</i>	<i>Choice†</i>	<i>Duration of Employment</i>
ABU	Management System Responsible	Manufacture of wood and paper products, and printing (CC)	medium	moderate	3
CODY	Key-Account Manager	Manufacture of electrical equipment (CJ)	medium	low	½
DON	Chief Executive Officer	Wholesale trade, except of motor vehicles and motorcycles (G)	medium	high	15
INA	Project Manager	IT and other information services (JC)	large	moderate	4
JAN	Quality Manager	Manufacture of wood and paper products, and printing (CC)	large	moderate	2
JOHN	Developer	IT and other information services (JC)	small	high	6
ONA	Active-Passive Manager	Financial and insurance activities (K)	large	low	11
RILEY	Project Manager	Manufacture of machinery and equipment n.e.c. (CK)	large	low	1
SAM	Public Relations Manager	Residential care and social work activities (QB)	medium	low	8

\*) small = 1 to 49 employees; medium = 50 to 249 employees; large = 250 and more (OECD & Eurostat, 2005); †) small = interviewee has little or almost no choice with respect to his PWS organization; moderate = interviewee has a menu with defined options from which he/she can chose; high = interviewee is allowed to determine numerous aspects of their work (Davenport et al., 2002)

Table 1. Sample characteristics

As shown in Table 1, we have set up a typology of three criteria to describe our sample of interviewees. We made sure that these criteria were easy to check during the interviews. The first criterion was *organizational size*, which had been shown to have an influence on organizational culture (Gray et al., 2003). We chose this criterion as we wanted to see how people in different organizational settings organize their PWS. The second criterion was the *level of choice*, admitted to KWs by their organization, which influences the individual KW's feeling of autonomy and satisfaction (Davenport et al., 2002, 28). We chose this criterion as we wanted to see the influence of the organizational regime on PWS organization. The third criterion was the interviewee's *duration of employment*. We used this as a proxy for the interviewee's level of proficiency, which has been shown to have an influence on the way individuals deal with situations within their professional environment (Dreyfus & Dreyfus, 1988). We used this criterion, as we wanted to see how persons with different levels of proficiency use their PWS. In addition to the three sampling dimensions, Table 1 gives the pseudonym of all interviewees, their job description and the sector their organization is located in.

## 4 Perspectives on Personal Workspaces

In our study, we found four perspectives that our interviewees had taken with respect to their PWS arrangements: *archive*, *perpetual beta*, *personal branding* and *territory*. These perspectives will be described below. Additionally, we have found evidence that helped us to re-formulate our PWS definition: We identified two types of elements that formed PWS arrangements. The first type were *artefacts*. These are objects, which are created or enacted by their users through an intentional process (Borgo et al., 2011, 11; Orlikowski, 2008, 460). We found artifacts, which were related to ICT – e.g., computers, smartphones or software products – and others, which were not – e.g., physical documents or physical notebooks. The second type of elements were *human information sources*. These were persons, who acted as providers of information. All interviewees' PWSs comprised combinations of these two types of elements. Based on this empirical findings, we redefine *PWS* (in a narrow sense) as an arrangement of computer artifacts and non-computer artifacts as well as human information sources, which KWs use as a tool to support their work.

### 4.1 Archive

The first PWS perspective is labelled *archive*. It addresses the observed stance of individuals with respect to the maintenance of a set of elements within their PWS that are solely dedicated to the storage of information. KWs enact their PWSs as archives by defining the elements to be archived, the storage location and the way of retrieval. In turn, the PWSs enact KWs as archivists by providing access to traceable, permanently stored information.

Our interview partners were often confronted with work situations in which access to information was important. This was typically triggered by the need to have arguments at hand, why certain actions had been taken in the past. In reaction to such 'threats', interviewees seemed to prepare themselves by maintaining archiving artifacts within their PWS. *DON*, for example, used an extensive folder structure, where he filed any piece of information that he could get hold of. *SAM* prepared himself for unexpected requests by maintaining a database, where he equally filed information very tidily. *DON* described the need for his archive in the following example, where he had to argue for a strategic decision with respect to a customer before the management board:

*You know, in this case [when DON has to argue, why he had decided in a certain way] you need to have things at hand. Ok, if I need something, I go into the competitor folder [of his structure of folders]/ I take out what I need and then I can show it. And you simply have to prepare this for that case.<sup>1</sup>* *DON*

---

<sup>1</sup> With regard to the original-voice statements in this text, we use the slash-characters (/) to indicate a semantic break in the speech, three dots in square brackets to indicate an omissions of words and square brackets to indicate an amendment by the authors.

*JOHN* thought about his PWS in a similar way. For him, too, archiving was a basic need. Although he admitted to hardly ever look up things in his archive, it seemed to give him a good feeling to know that he could, if necessary. For him archiving seemed to be done for archiving's sake:

*These other artifacts [points to a group of artifacts in the diagram that had been constructed in the course of interview two] are only for archiving, I rarely read them more than once.* *JOHN*

There, however, seemed to be a trade-off between putting information into an archive and having information readily at hand. The reason for this lay in the circumstance that restoring typically took some time. Some of our interview partners, therefore, emphasized the importance to keep information in ones memory as well. *DON* and *INA*, for example, lay great emphasis into memorizing monitoring results. They, however, admitted that memorized information was often inaccurate or could get lost after some time. Therefore, it had to be backed up with the original information, which could be kept in an archive. *DON* explained this as follows:

*In 95% of all cases [where DON has to argue for something], I can do it with my head [...] and the rest is reinforced by other means. [...] if it is all about a specific detail [...] You cannot keep that in mind, commonly. But then you know, okay, I have stored this detail/ I could go there [into his structure of folders] and look it up.* *DON*

In contrast to *DON* or *SAM*, *ONA* did not maintain an archive herself. Once she had completed a task, there was typically no need for her to keep task related information anymore. She did not seem to feel the need to create and maintain a PWS artifact, which was only dedicated to archiving. Instead, she used already existing elements to restore information. In doing so, *ONA*'s PWS was adjusted to her work activities, which were more specific than those of *DON*. She typically performed tasks, which were completed after some time and did not need to be considered afterwards again. *DON* in contrast never knew, if a particular information could be valuable and, therefore, was in need to have a lot of information at hand.

With respect to archiving, we also found that some individuals seemed to extend their archives over their own PWS's boundaries and maintained access to other's archives as well. *JAN*, for instance, set high hopes in upcoming technical artifacts as the currently implemented ERP system. These artefacts would, so he argued, allow him to access high quality information. These artifacts, however, did not only provide access, but also determined a certain structure of information, which helped *JAN* to avoid additional translating effort and allowed him to use information immediately:

*From here on [points to one of the ladders that have been constructed in interview three], I want to increase the quality of information. And how am I supposed to do this? By providing technical aids. [...] For me it is important that I can set on a technical aid like an ERP system/ that I can be sure: I have the status of production at one sight.* *JAN*

The potential future access to the company's ERP system was an appreciated shortcut to information for *JAN*. While at the moment he had to collect all this information manually, the ERP system would allow him to reduce his information gathering to a smaller amount. We have found similar situations with *DON* too. He was looking forward to the implementation of a CRM system. This system was intended to have similar impact as *JAN*'s ERP system. He described it as a shortcut to information, which would have to be collected from other sources, otherwise. In both cases, the system seemed to take the role of a PWS element, which was used to claim information with a certain structure from other information sources.

## **4.2 Perpetual beta**

*Perpetual beta* refers to the observed stance of individuals seeing their PWS as being based on some conceived plan, which is subject to continuous change and instability, triggered by certain stimuli. KWs enact their PWSs as perpetual betas by constantly adapting its structure to approach a probably unstable ideal state. In turn, the PWSs enact KWs as explorers, who can experiment with their PWSs in a testing plant atmosphere.

PWS arrangements did not seem to be steady over time. They were constantly changed by their creators. *JAN* described his PWS as an efficient tool, which he had constructed thoroughly. He, however, admitted

that he was aware of the threat that this tool might get inefficient after some time. Whenever this happened, he changed it. *JOHN* similarly described his dealing with his PWS. He explained that he had observed some psychological strain with respect to his PWS that rose when his PWS arrangement got inefficient. This typically caused him to change the structure of his PWS from time to time:

*It is always the same, you feel the pain and it is coming and coming and sometime, the critical point is reached, where I decide that I need an application or a new computer – if it got too slow – or I have to restart it [the computer] because there is no more swap or anything else [...]* *JOHN*

Similar notions could be found with other interviewees as well. *ABU* explained how he allowed some change within parts of his PWS. This was often necessary as environmental conditions – e.g., project teams – changed. Other areas, however, were kept stable. There were only three important artifacts within his PWS – his laptop, his smartphone and a physical notebook – that remained unchanged. *JAN* continuously collected information about measuring devices and stored them in a spreadsheet. In our first interview, he emphasizes that this artifact, to him, was definitely an intermediate solution, which he was looking forward to be replaced by a ‘proper solution’. Three months later, when we met for the second time, he showed the new solution that he had lately replaced his old spreadsheet with, to administer this information in a more efficient way, as he said.

Intermediateness of PWS solutions was described as an important issue by several of our interviewees. We think this can be described as an inner desire of individuals to keep their PWS open for innovation. *DON* admitted that he sometimes installed new software if he thought it could help with an existing problem. Likewise, *CODY* explicitly named ‘interesting new software’ as a separate artifact in his PWS.

What results from this desire to try out new things, however, is a conflict between allowing oneself to innovate and omitting innovation. On the one hand, innovation might save time, enhance quality or enable new activities by providing new functions to the individual. On the other hand it can take precious time and, therefore, be ‘inefficient’. *ABU* addressed this conflict in his description of the three important PWS elements that he calls his ‘inner toolset’:

*I certainly like to try out new things. I try to keep the base technologies, which support – so to speak – my personal management, constant – I could not stand a change of these technologies every two months, because that would drive me wild. There must not be any time wasted on that – these are my tools and they have to work – that is it.* *ABU*

Whenever the trial or implementation of new artifacts could be proved to be an increase of value or a decrease of cost, it seemed that interviewees endorse constant change. *CODY* emphasized that he could always initiate a change of artifacts in his very restrictive company’s environment, if only he could argue its benefits to the company’s authorities. Likewise, *JAN* said that he had the freedom to change his PWS, if only the change yielded a higher state of efficiency and could, therefore, be argued with positive outcomes.

We found several triggers for change. *JOHN* asked for artifact recommendations on the Internet and normally considered suggestions from his community on the fly. *DON* was in active contact with people outside his company, whose solutions he sometimes adopted, if he liked them, although he had no certainty about its outcome. Moreover, he described that the company’s ERP system, which was part of his PWS, had been replaced by a new system by order of the company. Finally, *ONA* used software macros to customize her PWS. Some of her colleagues were very experienced in macro-creation. If she saw a new macro in use that she liked, she adopted it for her own PWS.

### **4.3 Personal branding**

*Personal branding* refers to the observed stance of individuals with respect to their PWS as an aid to conveying a self-conception to themselves and others. KWs enact their PWSs as personal brandings by creating a self-conception that is embedded into the use of elements. In turn, the PWSs enact KWs as brands by presenting their self-conception to other.

We found that some of our interviewees described their PWS as a collection of work-related information. In contrast to the archive perspective, however, this collection of information was not used for storage

purposes, but rather as a way of self-identification. This means that the PWS was intended to reflect one's own work. In that, it could be understood as a surrogate for a tangible product of work that could be shown to others to prove one's profession. *SAM*, for instance, centered his PWS on a small 'database', where he stored all his issued press releases as well as the newspaper articles that resulted from them. The central motive behind this was to have a tangible product that he could use in case he wanted to show his work to others, for example, for the purpose of applying for a new job:

*That is why I do this [collecting work related information in his own database], I think. One could say it is for my own ego or anything like that – if one would like to apply for another job, anywhere else – you can say: In 2008 the reporting was that way and in 2009 it was that way, because I have implemented these measures.* *SAM*

*DON* used his extensive structure of folders in a similar manner, to keep anything that had been done by him. This collection was primarily an archive for him. It, however, also served as an identity building thing for him and his work that he also proudly present to others.

Some of our interviewees deliberately used their PWS description to generate a certain image of themselves by using symbols in their PWS descriptions. *JOHN*, for instance, repeatedly used brand names of PWS artifacts to distinguish himself from others. He also used other predicates with respect to his PWS organization that seemed to contribute to an inner picture of himself. Some of these predicates were 'net-generation', 'premium user' or 'techies as we are'. *ONA* acted likewise. She decidedly emphasize the technical terminology that was attached to her job. Her PWS artefacts, for example, included 'A-Creeping' and 'Curve Steeper' algorithms or allowed her to calculate a 'Snow-Ball-Digital-Reverse-Dual-Currency-Range-Approval'. The PWS seemed to offer a good possibility to maintain a favorable image of oneself and to use this to form one's own reputation and the opinion that others have of oneself. Moreover, people also seemed to maintain these images for themselves as *JOHN* explained in the following statement, where he describes why he uses a particular artefact in his PWS:

*I simply want to believe that I am an autonomous actor, who knows what he needs and what is good for him.* *JOHN*

#### **4.4 Territory**

*Territory* refers to the observed stance of individuals demanding the freedom to design their own PWS unconditionally and without others interfering with their decisions. KWs enact their PWSs as territories by taking PWS elements into possession and controlling their use. In turn, the PWSs enact KWs as territory possessors by providing a well-known set of elements that they can rely on.

Comprehensibility of PWS elements was an important notion for many of our interview partners. Some of our interview partners emphasized the need to understand how a particular PWS element worked. *CODY* used a self-made spreadsheets in his PWS to collect all relevant information about a customer in one place. This spreadsheet also contained calculations and programming elements. Although similar spreadsheets were provided by the organization, *CODY* had preferred to reinvent this artifact to understand how it worked. *RILEY*, likewise, could have used an organizationally provided report about the status-quo of all ongoing enhancement projects in his company. This report, however, came with a software bug and did not always provide correct information. *RILEY*, therefore, had rebuilt the report for himself as he explained in the following statement:

*There is a report, which retrieves all enhancements for me [...] though it would be interesting to me, it is not quite correct. [...] I have straightened it once – only for me in an Excel sheet – and if I now see that a new ER [enhancement request] is coming in, I directly import it into my own list.* *RILEY*

Apart from comprehension, a second set of phenomena strongly influenced our interviewees' viewing of their PWSs as a territories. This was the desire to be able to unconditionally design one's own PWS. This desire was mentioned by several of our interview partners. *SAM* used a database to collect all his monitoring results. He emphasized that he wanted to be and stay in full charge of that artifact. Therefore, he maintained this database in his private sphere of artifacts to avoid possible restrictions that could be imposed by his company's authorities.

Using private artifacts – in general – was a prominent strategy of our interviewees to maintain control within their PWSs. *SAM* used this strategy with his monitoring database. *CODY*, likewise, secured access to his customers by giving them his private phone number. *DON* used a private laptop to circumvent the corporate ICT infrastructure and *JAN* synchronized his office computer with his private one with the help of a free web service. Team colleagues of *INA* even operated a private Web server in their department to secure certain functionality for the team. The desire to design one's PWS free of any restrictions was even strong enough to persuade individuals to decidedly violate corporate policies. *DON* explained how he avoided to use the corporate operating system by using his own computer.

*Yes, I bypass it [the corporately provided computer operating system Linux] in any case. And I bypass it decidedly, because Linux cannot offer those things I need...* *DON*

In addition to our interviewees' desire to maintain control within their own PWS, we have also found attempts where individuals seemed to extend control to others' PWSs as well. *JAN* used a self-made software to manage all kinds of process-related information. This software was a central part of his PWS, but was used by other persons within the company as well. *JAN*, however, was the only person, who was in full charge of this software. This allowed him to predetermine how the software could and must be used by others:

*There is always the risk that I could lose my overview, if everybody could create, store and distribute documents [in the self-made software]. But with the help of this software, every template, every document has to cross my table [...] because I have assigned the administrative privileges.* *JAN*

*ABU* had created a similar artifact. He used an Intranet platform, whose structure could only be edited by him. His colleagues had to use this platform in exactly the way, he had predetermined for them:

*And there is this other topic [the Intranet platform that ABU had implemented]/ where I/ the Intranet and all this. I have simply established this platform in exactly the way I wanted to have it [emphasizes the last words; Short break] for 50 people – full stop.* *ABU*

## 5 Discussion

This paper contributes to our understanding of how KWs deal with their freedom of choice with respect to their PWS. We found four PWS perspectives that individuals have been taking with respect to their PWS arrangements. These perspectives extend our understanding of the PWS in a narrow sense – an arrangement of computer artifacts and non-computer artifacts as well as human information sources, which KWs use as a tool to support their work. Although the PWS can be described as a tool, there are other perspectives on it that partially diverge from its tool notion.

The found perspectives open new possibilities to understand how KWs' PWS use influences task performance (Locke et al., 1984, 250). Task performance – the extent to which an individual contributes to the creation of goods/services that its organization produces (Motowidlo & Van Scotter, 1994, 476) – was found to be directly influenced by the level of focus and distraction of the performing individual. *Focus* denotes the attention of an individual towards task completion, task-related thoughts or task reappraisal (Smallwood et al., 2003, 171). *Distraction* demands attention capacities of individuals and leads to making priorities, taking cognitive shortcuts and ignoring certain stimuli and tasks (Baron, 1986, 29). Task performance was found lower when individuals were distracted in task execution, for instance, by the execution of self-management activities that did not belong to the actual task. Individuals were then found to be in need of more time for task completion, have a higher error rates or experience a worse affective state (Bailey & Konstant, 2006, 701).

The two PWS perspectives *archive* and *territory* seem to influence task execution in a focusing way. We found that archive supported *attention towards task completion*: Knowledge workers could use their archive to retrieve information quicker than if they had to look them up again. Likewise, archive enabled KWs to store large amounts of data, which could eventually be helpful in the execution of other tasks or even the current task in a way that had initially not been considered and, thus, supported *task-related thoughts*. Territory supported *task reappraisal*: KWs could use the deep understanding of their PWS arrangement to develop new strategies to accomplish task objectives.

The two PWS perspectives *personal branding* and *perpetual beta* rather seemed to influence task execution in a distracting way. Both showed characteristics of *demanding attention capacities*. If used as an identity-builder, KWs invested work time into constructing and maintaining their self-conception. When KWs maintained their perpetual beta PWS, they invest work time into acquiring new artifacts and integrating them into their PWS arrangement. Both activities, therefore, demanded resources that otherwise could have been spend on performing the actual tasks. This potentially lowers task performance.

Despite its potentially distracting momentum the latter two PWS perspectives, however, might also positively contribute to task performance: They can contribute to the KWs perceived enjoyment of work, which can positively affect acceptance and utilization of technology (Heijden, 2004, 701). If KWs attach positive associations to their PWS elements, this might increase their task performance by stimulating their focused task execution. This is supported by the findings of emotional theorists, who propose that positive emotions broaden the focus of attention and the scope of cognition and enhance performance (Fredrickson, 1998, 309-313). Their positive affect on satisfaction can, therefore, improve task performance (Cherrington et al., 1971, 535), as *INA* explained in her own words:

*If I can freely design my own workspace [...] the result is primarily that I feel well and if I feel well, I enjoy working and if I enjoy working, I am better at what I am doing and if I am better, I am more effective.* *INA*

## 6 Implications

The presented PWS perspectives articulate the multifaceted nature of PWS arrangements in the context of knowledge work. Our work's findings, therefore, have important implications for future research and practice. First, the found PWS perspectives complement the predominant image in research and practice that shows the PWS as a tool or tool-set for work. We have shown that the aspect of work support is definitely included in individuals' perceptions of PWSs, but is overlaid with other aspects, such as the desire to convey a particular image to oneself and others. Second, the presented perspectives are focused on the knowledge work activity monitoring. The PWS concept, however, is not necessarily limited to this activity. We, therefore, suggest to widen the research scope and include other activities as well. We also think that the found perspectives deserve empirical validation on a larger sample. Third, the presented PWS perspectives offer a promising way for KWs and organizations to get guidance for the conduction and management of self-organization. KWs can benefit from the insights of our research as we could show that self-organization can cause both challenges (e.g., inefficiency that emerges from perpetual beta) and benefits (e.g., work support that emerges from archive). While PWS can be something vital and beneficial in terms of addressing niche role problems that are not considered by corporate authorities, they also may lead to a loss of control and efficiency. Bearing this in mind, KWs can inform their approach and think about its appropriateness in the situation at hand. Organizations can benefit from our research insights as they offer them new sights on PWS management: The presented PWS perspectives emphasize a stronger relationship between individual and PWS. The PWS neither can be viewed as independent from the individual nor can the individual be viewed as independent from the PWS. Therefore, an adjustment of technology – for example, a ban on certain software products – does not only affect the PWS, but also affects KWs personally.

## References

- Alvesson, M. (2001). Knowledge Work: Ambiguity, image and identity. *Human Relations*, 54 (7), 863-886.
- Archer, S. (1988). 'Qualitative' research and the epistemological problems of the management disciplines. In A. Pettigrew (Ed.), *Competitiveness and the Management Process*: 265-302: Basil.
- Avital, M. (2003). Reexamining Information Systems Success through the Information Technology Professionals Perspective. *ECIS 2003 Proceedings*, paper 20.
- Bailey, B. P. & Konstant, J. (2006). On the need for attention-aware systems: Measuring effects of interruption on task performance, error rate, and affective state. *Computers in Human Behavior* 22 (4), 685-708.

- Baron, R. S. (1986). Distraction-Conflict Theory: Progress and Problems. *Advances in Experimental Social Psychology*, Volume 19, 1-40.
- Blackler, F., Reed, M. & Whitaker, A. (1993). Epilogue - An Agenda for Research. *Journal of Management Studies*, 30 (6), 1017-1020.
- Borgo, S., Franssen, M., Garbacz, P., Kitamura, Y., Mizoguchi, R. & Vermaas, P. E. (2011). Technical Artifact: An Integrated Perspective. FOMI.
- Cherbakov, L., Bravery, A., Goodman, B. D., Pandya, A. & Baggett, J. (2007). Changing the corporate IT development model: tapping the power of grassroots computing. *IBM Systems Journal*, 46 (4), 743-762.
- Cherrington, D. J., Reitz, H. J. & Scott, W. E. (1971). Effects of contingent and noncontingent reward on the relationship between satisfaction and task performance. *Journal of Applied Psychology*, 55 (6), 531-536.
- Cousins, K. C. & Robey, D. (2005). Human agency in a wireless world: Patterns of technology use in nomadic computing environments. *Information and Organization* 15 (2), 151-180.
- Crilly, N., Blackwell, A. F. & Clarkson, P. J. (2006). Graphic elicitation: using research diagrams as interview stimuli. *Qualitative Research*, 6 (3), 341-366.
- Davenport, T., Jarvenpaa, S. & Beers, M. (1996). Improving Knowledge Work Processes. *Sloan Management Review*, 37 (4), 53-65.
- Davenport, T. H., Thomas, R. J. & Cantrell, S. (2002). The Mysterious Art and Science of Knowledge-Worker Performance. *MIT Sloan Management Review*, 44 (1), 23-30.
- Davis, G. B. (2002). Anytime/anyplace computing and the future of knowledge work. *Commun. ACM*, 45 (12), 67-73.
- Dragunov, A. N., Dietterich, T. G., Johnsrude, K., McLaughlin, M., Li, L. & Herlocker, J. L. (2005). TaskTracer: a desktop environment to support multi-tasking knowledge workers, *Proceedings of the 10th international conference on Intelligent user interfaces: 75-82*. San Diego, California, USA: ACM.
- Dreyfus, H. & Dreyfus, S. E. (1988). *Mind Over Machine*. New York: Free Press.
- Drucker, P. F. (1959). *Landmarks of Tomorrow*: Harper and Brothers.
- Faugier, J. & Sargeant, M. (1997). Sampling hard to reach populations. *Journal of Advanced Nursing*, 26 (4), 790-797.
- Fredrickson, B. L. (1998). What good are positive emotions? *Review of General Psychology*, 2 (3), 300-319.
- Glaser, B. G. (1965). The Constant Comparative Method of Qualitative Analysis. *Social Problems*, 12 (4), 436-445.
- Gray, J. H., Densten, I. L. & Sarros, J. C. (2003). Size Matters: Organisational Culture in Small, Medium, and Large Australian Organisations. *Journal of Small Business and Entrepreneurship*, 17 (1), 33-46.
- Greenberg, E. (1992). Creativity, Autonomy, and Evaluation of Creative Work: Artistic Workers In Organizations. *The Journal of Creative Behavior*, 26 (2), 75-80.
- Gulikers, J. T. M., Bastiaens, T. J. & Martens, R. L. (2005). The surplus value of an authentic learning environment. *Computers in Human Behavior*, 21 (3), 509-521.
- Hansen, M. T., Nohira, N. & Tierney, T. (1999). What's your Strategy for managing knowledge? *Harvard Business Review*, 77 (2), 106-116.
- Heijden, H. v. d. (2004). User Acceptance of Hedonic Information Systems. *MIS Quarterly*, 28 (4), 695-704.
- Holsapple, C. W. & Jones, K. (2004). Exploring Primary Activities of the Knowledge Chain. *Knowledge and Process Management*, 11 (3), 155-174.
- Holsapple, C. W. & Whinston, A. B. (1987). Knowledge-based Organizations. *The Information Society*, 5 (2), 77-90.
- Kelloway, E. K. & Barling, J. (2000). Knowledge Work as Organizational Behavior. *International Journal of Management Reviews*, 2 (3), 287-304.
- Kelly, G. (1992). *The Psychology of Personal Constructs*. London: Routledge.

- Knights, D., Murray, F. & Willmott, H. (1993). Networking as a Knowledge Work: A Study of Strategic Interorganizational Development in the Financial Services Industry. *Journal of Management Studies*, 30 (6), 975-995.
- Kolb, D. A. (1984). *Experiential learning: experience as the source of learning and development*. Upper Saddle River: Prentice-Hall.
- Kuzel, A. J. (1992). Sampling in qualitative inquiry. In B. E. Crabtree, & W. L. Miller (Eds.), *Doing qualitative research*, Vol. 3: 31-44: Sage.
- Locke, E. A., Frederick, E., Lee, C. & Bobko, P. (1984). Effect of self-efficacy, goals, and task strategies on task performance. *Journal of Applied Psychology*, 69 (2), 241-251.
- Maier, R. (2007). *Knowledge Management Systems*: Springer.
- Mårtensson, P. & Lee, A. S. (2004). Dialogical Action Research at Omega Corporation. *MIS Quarterly*, 28 (3), 507-536.
- Mason, J. (2006). Mixing methods in a qualitatively driven way. *Qualitative Research*, 6 (1), 9-25.
- Miles, M. B. & Huberman. (1994). *Qualitative Data Analysis: An Expanded Sourcebook* (2 ed.). Thousand Oaks: Sage.
- Motowidlo, S. J. & Van Scotter, J. R. (1994). Evidence that task performance should be distinguished from contextual performance. *Journal of Applied Psychology*, 79 (4), 475-480.
- Myers, M. & Walsham, G. (1998). Exemplifying interpretive research in information systems: an overview. *Journal of Information Technology*, 13 (4), 233-234.
- OECD & Eurostat. (2005). *Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data* (3 ed.). Paris: OECD.
- Orlikowski, W. J. a. S., Susan V. (2008). Chapter 10: Sociomateriality: Challenging the Separation of Technology, Work and Organization. *The Academy of Management Annals*, 2 (1), 433-474.
- Patton, M. Q. (2002). *Qualitative research and evaluation methods*: Sage.
- Pearce, C. L. & Barkus, B. (2004). The Future of Leadership: Combining Vertical and Shared Leadership to Transform Knowledge Work [and Executive Commentary]. *The Academy of Management Executive*, 18 (1), 47-59.
- Pearce, C. L. & Manz, C. C. (2005). The New Silver Bullets of Leadership: The Importance of Self- and Shared Leadership in Knowledge Work. *Organizational Dynamics*, 34 (2), 130-140.
- Pyöriä, P. (2005). The concept of knowledge work revisited. *Journal of Knowledge Management*, 9 (3), 116-127.
- Reynolds, T. J. & Gutman, J. (1988). Laddering Theory, Method, Analysis, and Interpretation. *Journal of Advertising Research*, 28 (1), 11-31.
- Scardamalia, M. & Bereiter, C. (2003). Knowledge building environments: Extending the limits of the possible in education and knowledge work. In A. DiStefano, K. E. Rudestam, & R. Silverman (Eds.), *Encyclopedia of distributed learning*. Thousand Oaks: Sage Publications.
- Schultze, U. (2000). A Confessional Account of an Ethnography about Knowledge Work. *MIS Quarterly*, 24 (1), 3-41.
- Schultze, U. (2004). On knowledge work. In C. W. Holsapple (Ed.), *Hanbook on knowledge management 1: Knowledge matters*: 43-58: Springer.
- Schultze, U. & Avital, M. (2011). Designing interviews to generate rich data for information systems research. *Information and Organization*, 21 (1), 1-16.
- Smallwood, J., Obonsawin, M. & Heim, D. (2003). Task unrelated thought: The role of distributed processing. *Consciousness and Cognition*, 12 (2), 169-189.
- Sørensen, E. B. & Askegaard, S. (2007). Laddering: how (not) to do things with words. *Qualitative Market Research: An International Journal*, 10 (1), 63-77.
- Strauss, A. L. & Corbin, J. M. (1990). *Basics of qualitative research: grounded theory procedures and techniques*. Thousand Oaks: Sage.