

Persuasiveness, Personalization & Productive Workplace Practices with IT-Knowledge Artefacts

Louise Harder Fischer¹, Lene Pries-Heje¹

¹ IT-University of Copenhagen, Rued Langgaardsvej 7, 2300 Copenhagen S, Denmark.
{Louf, lph}@itu.dk

Abstract. The workplace is getting increasingly globalized, virtualized and networked. At the same time, work itself has become discrete, autonomous and complex. In a fast changing world, the individual knowledge worker and his interactions becomes the new locus of value creation. Management promote – not dictate - lateral technologies to enable interaction among peers – the core of knowledge creation. To target productive behavior the knowledge professional appropriate these technologies building individualized IT-knowledge artefacts. This practice leads to several dilemmas in enterprise-wide knowledge work. We see a possible way forward for improving workplace practices with IT-knowledge artefact based applications, by combining new insight of how different personality traits prefer different knowledge sharing processes with new insight on personalizing persuasive technology. We explore new research and argument for further research in an attempt to solve the dilemmas in the networked enterprise.

Keywords: Workplace practices, IT-knowledge Artefacts, Individualization, Knowledge Creation, Productivity, Autonomy, Persuasive Technologies.

1 Introduction

The main contribution of knowledge professionals is a good decision [1]. Taking good decisions require judgment, instincts, experience and knowledge [2]. Knowledge is created in human-to-human interaction through conversion of tacit to explicit knowledge [3]. Increasingly we see that individuals and their interactions come to the foreground of value creation in the networked enterprise. Discrete decisions and idiosyncratic behaviors in specific situations and varying contexts is thus a natural part of knowledge work [4]. To succeed in competitive markets organizations must therefore support autonomy and allow for autonomous practices [4, 5, 6]. They must also enable high quality interactions among their knowledge professionals.

In the networked enterprise lateral technologies are seen as an enabler of human-to-human interactions [2, 5]. Under a unified interface, we find applications such as e-mail, chat, IP-call, virtual meeting, presence, calendar and message apps accessible from any device connected in the cloud. The applications are easy to use and often well known to people. When introduced the use is non-mandatory; the adoption is

Copyright © by the paper's authors. Copying permitted for private and academic purposes.

In: R. Orji, M. Reisinger, M. Busch, A. Dijkstra, A. Stibe, M. Tscheligi (eds.): Proceedings of the Personalization in Persuasive Technology Workshop, Persuasive Technology 2016, Salzburg, Austria, 05-04-2016, published at <http://ceur-ws.org>

voluntary and the exploitation formed by individual preferences [5, 7]. These technologies bring with them possibilities for interacting more productively, but often we see counter-productive practices and autonomy paradoxes [6]. From a management point of view, productivity enhancement in this non-routine cognitive work is a difficult because it does not respond to the traditional measures of re-configuration and standardization [2]. Productivity and performance enhancement *must emerge* in context by the knowledge workers themselves [2, 5, 7].

Prior to this paper, we studied two cases of knowledge professionals [5]: mobile workers/solution architects, in a global software company; and office workers/IT-consultants, in a global engineering company, both of which performed many routine and non-routine cognitive tasks (knowledge work) based on many human-to-human interactions during the day mediated by lateral technology. The main finding was a rising tension among professionals tackling the autonomous behavior and individual preferences for IT-knowledge artefacts [8] and the process of interacting with others productively, while delivering value [9].

In this paper, we set out to theoretical explore if the area of personalization in persuasive technology [10] can provide new ways of tackling this tension. We do this by constructing an argument, based on new research, which we will present, for why and how we – the authors – could and should explore this area further.

We have structured the paper in the following way: in section 2, we communicate the productivity dilemmas in workplace practices found in the two prior studies. In section 3, we present new knowledge on the relation between personality traits, knowledge work practices and IT-knowledge artefacts. In section 4, we connect the relevant dots – mainly from theory - of personalization in persuasive technology to the empirical insights of productive behaviors in knowledge work and suggest a road forward.

To make clear our contribution to the personalization in persuasive technology workshop [10] is to participate in developing an approach achieving productive practices of high quality human-to-human interaction with technology in the entangled context of knowledge, people and technology in the networked enterprise.

2 Dilemmas in productive workplace practices

When studying the entangled practice of people, technology and knowledge we apply an interpretative lens from the work of Cabitza and Locoro [8] to carve a road through the complexity in contemporary knowledge work. The lens focus on the use of IT-artefacts, in the light of how they support knowledge related processes in an organizational context. The lens guides the work of analysts and designers, when designing and understanding IT-knowledge artefacts-based applications in organizational contexts [8]. IT-knowledge artefacts (ITKA) are - paraphrasing Cabitza and Locoro - a material IT artefact, which purpose is to enable and support knowledge related processes with in a community. ITKA's act as a support or scaffold to the expression of actionable behavior [8]. ITKA's are categorized on a dimension of either supporting representational objective knowledge processes with a stable IT-artefact or socially situated knowledge practices with an end-user malleable IT-artefact. The purpose of ITKAs are socio-technical fit and joint optimization.

Lateral technologies are primarily socially situated ITKA's: they adapt to the context because of user appropriation and exploitation supporting various interactions [9]. In table 1, we report our findings from prior case studies also reported in [5, 9].

Table 1. Findings from prior case studies.

The office worker	The mobile worker
We observed that office workers produced autonomy when appropriating the ITKA's. The result was very dissimilar practices. Examples varies from reading e-mails once a day to constantly checking. From putting on video in virtual meetings to holding without. From working at home frequently to feeling obliged to work in an open-office. From preferring e-mails to F2F-meetings. From respecting presence indicators, to requesting attention when people are in "do not disturb me" mode. From trying to codify information instead of keeping it in a process. The individual practice became counter-productive on a collective level. The freedom to appropriate individually was valued, and was experienced to lead to productivity.	We observed that the mobile worker established productive practices by co-configuring the appropriation of ITKA's. They felt very dependent on effective interaction with each other. Being mobile means that you work from anywhere any time. Therefore, they assigned the same purpose to the various applications. E-mail was used when documentation was needed. Calls were good for quick solutions. F2F-meetings were good for collaboration and knowledge creation. Virtual meetings with video were good when not being able to show up physically. The co-configuration created socially situated ITKA's with a socio-technical fit on individual and collective level. The freedom of location was a way to produce autonomy in work.

Table 2. Dilemmas in workplace practices with ITKA's.

Dilemma	Interpretation from case studies
<i>Different use of ITKA's affects productive practices on a collective level.</i>	The use-in practice and the appropriation of ITKA's differ in the case of the office worker - from the mobile worker - in the sense that the socially situated ITKA's are too individualized not producing organizational socio-technical fits.
<i>Mandating change will affect autonomy.</i>	Autonomy in knowledge work is a universal claim; mandated and specified use would affect autonomy. In both cases, the experienced freedom to control practice-use of technology and/or choice of location, are highly valued and is experienced as leading to productivity.
<i>Autonomy lead to productivity.</i>	Acknowledging peoples differences is increasingly important at the contemporary workplace. Organizations allowing people to be one self is according to Goffee & Jones (2015) [11] more successful.

In table 2, we shortly present the abstracted dilemmas from our two cases. What we see is appropriation, caused by a high degree of end-user malleability - and autonomy to do so – resulting in sociotechnical fits at the individual level in both cases, but in the case of the office worker, a misfit on the collective level is experienced [9].

3 Knowledge practices and personality traits

From our empirical studies [5, 9] we find that ITKA's are molded differently and individually both hindering and enabling productive practices at the workplace. We ascribe autonomy as an extrinsic factor that affect the socio-technical fit between people, knowledge and technology. We ascribe the individual preferences and underlying different purposes when users create socially situated IT-knowledge artefacts for individual or organizational socio-technical fit, an intrinsic factor. A not so well described area of intrinsic factors are the personality traits (PT's) and their influence on knowledge sharing behavior. In a recent study done by Jedar Zelaya [12] an association was found between PT's and specific knowledge conversion processes. The PT's - the big five factors - are openness to experience, conscientiousness, extraversion, agreeableness and neuroticism [12,13], referred to as OCEAN. The knowledge creation processes being socialization, externalization, combination and internalization – frequently referred to as the SECI-spiral [3,12]. While previous research has established a connection between openness to experience and knowledge sharing in general, the present study nuances this view by connecting the different knowledge conversion processes with personality traits. Since no correlation found relating specifically to neuroticism and agreeableness, we have listed the relevant PT's and the hypothetical and theoretical relation we see in table 3.

Table 3. Personality traits connected to SECI and ITKA's.

Personality traits	Connection to SECI	The hypothetical practice with ITKA's
Openness to experience: Curious, imaginative, insightful, original, introspective etc.	Openness to experience is associated with the entire knowledge conversion spiral.	Socially situated ITKA's support the whole SECI spiral. Sharing the same trait practices will lead to individual and organizational fit and is a plausible hypothesis as in the case of the mobile worker.
Extraversion: Active, outgoing, enthusiastic, talkative, rapid personal tempo etc.	Extraversion is associated with externalization that is the process of converting tacit-to-explicit knowledge through conceptualizing.	The ITKA supports the process of tacit-to-explicit knowledge conversion. Behavior of making many calls, replying to e-mails all the time is a plausible hypothesis as in the case of some of the office workers.
Conscientiousness Efficient, organized, planful, reliable, responsible, thorough	Conscientiousness is associated with combination that is the process of converting explicit-to-explicit knowledge through modelling.	The ITKA supports the process of explicit-to-explicit knowledge conversion. Behavior of reading e-mails once a day or pushing for modelling of information is a plausible hypothesis as in the case of some of the office workers is a plausible hypothesis.

4 Productive ITKA-practices through personalized persuasive technology

New knowledge on individual differences and susceptibility to persuasive strategies from Akis & Temizel [13] has inspired us to suggest a way forward in productive knowledge- and workplace practices in combination with personalized persuasive strategies. Changing design elements in the ITKA based applications to target productive knowledge sharing behavior is a possible way forward. We see a logic connection between the findings from the following scholars, also illustrating the logic flow in our thinking:

Fogg’s research [14] on captology inspire us to frame a target behavior of appropriating socially situated ITKA’s to support the whole SECI-spiral in the persuasion context of knowledge work mediated by lateral technologies.

From the work of Zelaya [12] we assume that people with PT of openness to learning already exhibits the target behavior (as seen in the case of the mobile worker) while extrinsic and conscientiousness PT’s does not (as seen in the case of the office worker). We limit our suggestions to these three PT’s since Zelaya did not find a correlation with neuroticism and agreeableness.

Alkis and Temizel’s research and new insight on how different personalities are more susceptible to certain persuasion strategies. They use Cialdini’s six strategies: reciprocation, scarcity, liking, commitment, consensus and authority [13]. The study finds that PT of extraversion are susceptible to reciprocation, scarcity and liking. The PT of conscientiousness is susceptible to reciprocation, authority and commitment. We suggest exploring the possibility to target the PT’s with these specific strategies, building them into the design of ITKA-based applications.

We suggest that we continue the work on persuasive system design principles of Oinas-Kukkonen and Harjumaa [15] and critically select among those design principles that best support the target behavior. We show a preliminary selection and relation in table 4. Since the strategies of liking and authority correlates negatively with other PT’s we do not include them at this point [13].

Table 4. Design principles that support specific persuasive strategies.

Persuasive strategies [13]	Design Principles [15]
Reciprocation	Dialogue support (praise, reminders)
Scarcity	Dialogue support (rewards, suggestions)
Commitment	Social support (ex. social facilitation)

The hypothetical practices suggested in table 3, needs further validation and research. We must further research the direct link between PT’s and specific appropriation of ITKA’s. The links we argument for in table 4, must be researched and developed further to test if there is a way forward in the area of productive knowledge practices and personalization in persuasive technologies. We must further explore and develop design principles in ITKA-based applications. The aim is new knowledge and framework development on how to establish productive workplace practices with personalized persuasive ITKA-based application supporting enterprise wide knowledge sharing.

In conclusion, knowledge work of high quality is a competitive resource in the networked enterprise. Creating value rely on the quality of human-to-human interaction enabled and molded in socially situated ITKA's with socio-technical fit on the individual and collective level. We hope to bring this research suggestion further by engaging in the discussion at the workshop of personalization in persuasive technologies in Salzburg 2016. We will focus on debating the relevance of persuasive technology in the area of productive workplace practices with ITKA's.

References

1. Milkmann, L. Chugh, D. Bazerman, MH.: How can decision making be improved? *Perspectives on Psychological Science* vol. 4 no. 4 379-383 (2009)
2. Chui, M; Manyika, J; Bughin, J; Dobbs, JR; Roxburgh, C; Sarrazin, H; Sands, G & Westergren, M.:The social economy: Unlocking value and productivity through social technologies. McKinsey Global Institute (2012)
3. Nonaka, I. Toyama, R, Hirata, T.: Managing Flow – a process theory of the knowledge-based firm. Palgrave Macmillan (2010)
4. Drucker, PF.: The biggest challenge – Knowledge worker Productivity. *California Management Review* vol. 41, No. 2 Winter (1999)
5. Harder-Fischer & L, Pries-Heje, L.: Co-configuration in Interaction work. IRIS Conference, Oulu, Finland. Paper 37. *Proceedings of IRIS 2015* (2015)
6. Mazmanian, M, Orlokowski, WJ, Yates, J.: The Autonomy paradox: the implications of Mobile E-mail Devices for Knowledge professionals. *Organizations Science*, 24 (5): 1337 - 1357 (2013)
7. McAfee, A.: Mastering the three worlds of information technology. *Harvard Business Review* (pp. 141 – 148) (2006).
8. Cabitza, F. & Locoro, A.: Made with Knowledge: disentangling the IT Knowledge Artifact by a qualitative literature review. *Proceedings of the 6th International Conference on Knowledge Management and Information Sharing*. Rome, Italy, (pp. 64–75) (2014).
9. Harder Fischer, L & Pries-Heje, L.: The misfits in knowledge work – grasping the essence with the IT-Knowledge Artefact. *Proceedings of KITA 2015* (2015).
10. Orji, R. Busch, M. Dijkstra, A. Reisinger, M. Stibe, A. Tscheligi, M.: Personalization in persuasive technology. Call for workshop in conjunction with Persuasive Conference 2016
11. Goffee, R. and Jones, G.: Why should anyone work here – how to create an authentic organization, HBR, (2015)
12. Zelaya, J.: The Effect of Personality on Knowledge Creation Processes - Toward KC Optimization in Teams based on Human Attributes. In *Proceedings of the 7th International Joint Conference on Knowledge Discovery, Knowledge Engineering and Knowledge Management (IC3K 2015)* - Volume 3: KMIS, pages 62-69 (2015)
13. Fogg, BJ.: Persuasive Computers: Perspectives and research Directions. *CHI 98* April (1998).
14. Alkış, N. & Temizel, TT.: The impact of individual differences on influence strategies. *Personality and Individual Differences*. Volume 87. Pages 147-152 (2015)
15. Oinas-Kukkonen, H. & Harjumaa, M.: Persuasive systems design: Key issues, process model, and system features. *Commun. Assoc. Inf. Syst.* 24, 28 (2009)