

# Advantages, Challenges and Contradictions of the Transformative Nature of Telework: A Review of the Literature

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### **ABSTRACT**

Information and communication technologies (ICT) have had, and continue to have, a profound impact on the way work is organized, undertaken and managed by organizations and their employees. Telework, in particular, allows employees to work anywhere and anytime. These developments are not simply extending earlier temporal and spatial boundaries of work; they are profoundly changing the nature of work itself. To gain a better understanding of the changing nature of work and the implications for organizations and employees, we conducted a literature review that identified in total 24 different advantages and challenges of telework. We also show that there are inherent contradictions among these advantages and challenges, thus outlining interesting questions and opportunities for future research and alerting practitioners to possible dilemmas arising from telework arrangements.

### **Keywords**

Virtual work, ICT, telework, telecommuting, literature review, advantages, challenges, contradictions.

### **INTRODUCTION**

In many professional occupations work activities and interpersonal communication are increasingly mediated through information and communication technology (ICT). The ubiquity and convergence of ICT have made it possible for many work activities to be undertaken from almost anywhere and at any time. ICT enabled remote work – often referred to as *telework* – is not only reducing the limitations of the physical co-location of work activities; it is changing the nature of work, the role and engagement of individuals in work processes, and the ways organizations operate and manage work processes. These changes are becoming ever more consequential with the development of new ICT (Dixon and Panteli, 2010; Schweitzer and Duxbury, 2010). This paper is concerned with the nature and impact of telework and its potential challenges and advantages for employees and their organizations. A deeper understanding of these issues provides a foundation for better understanding the transformative nature of telework.

By pushing the boundaries of when and where one can engage with work related activities, telework is not simply transcending previous temporal and spatial limitations. Telework is changing the nature of work itself, with important and fundamental implications for our understanding of work (Ling, 2008), the role, use and design of ICT (Yoo, 2010; Bødker et al., 2012), and the way in which collaboration is undertaken (Smith and McKeen, 2011; Wang and Haggerty, 2011). One important aspect of these profound changes is to better understand the advantages and challenges associated with telework for individuals and organization. There are two reasons for engaging with such research. Firstly, the findings in earlier research in Information Systems (IS), management and other disciplines are ambiguous and contradictory, revealing

potentially positive as well as negative outcomes (Gajendran and Harrison, 2007). Secondly, the phenomenon of telework and its associated outcomes, requires further attention by IS researchers due to the increasing role and importance of ICT in the nature of work and its transformation.

We seek to further develop this research area for IS by providing an overview of potential outcomes of telework for organizations and employees. Our research is, therefore, conceptual in nature as it reviews earlier relevant research and introduces a conceptual frame of different aspects associated with telework identified throughout the literature. This research therefore enables IS scholars to better understand potential advantages and challenges arising from telework. By doing this we make the following contributions:

- (1) Provide an overview of potential advantages and challenges for organizations and individuals associated with telework; and
- (2) Exemplify how these aspects can at times work in different directions, thus contradicting each other.

These contributions are important as they can guide IS researchers in the formulation of research questions and hypotheses in the context of virtual ICT-enabled work, including the development of multi-level hypothesis looking at organizations and their employees simultaneously. Thus it contributes towards better understanding of aspects linked to telework and how they may be related. Moreover, identifying potential advantages and challenges is a necessary first step for IS research and practice towards finding means for unlocking advantages of ICT in the context of telework, while potentially mitigating negative outcomes associated with these challenges.

## BACKGROUND AND LITERATURE REVIEW

The concept of ICT enabled work from afar or telework is also known as 'remote work', 'virtual work' or 'telecommuting,' (Gajendran and Harrison, 2007). The idea of telework was first proposed in the US during the 1970s oil crisis as a means of reducing fuel consumption and dependence on fossil fuel (Nilles et al., 1976; Pyöriä, 2011). Initially, telework research was concerned with work arrangements where employees engaged in work in a place away from a central office, such as their home or a teleworking center. However, as a result of the development of mobile ICT, such as smartphones, telework research also started to acknowledge mobility as an additional important dimension (Hislop and Axtell, 2007). Furthermore, ICT is contributing towards permeating previous boundaries, which facilitates the inclusion of an external workforce into projects. Garret and Danziger's (2007) taxonomy of different conceptualizations of telework thus distinguishes fixed-site, mobile teleworkers and flexi teleworkers (a mix of both) that can either be working for organizations or in freelance arrangements as presented in Table 1.

		Contractual Relationship	
		<i>Organizationally-affiliated employment (employee)</i>	<i>Organization-independent employment (self-employed/contract work)</i>
<b>Work Locations</b>	<i>Home or satellite office</i>	Fixed-site teleworker	Freelance fixed-site teleworker
	<i>Field</i>	Mobile teleworker	Freelance mobile teleworker
	<i>Home, office, and field</i>	Flexi-worker	Freelance flexi-worker

**Table 1. Overview of Telework Types (adopted from Garret and Danizger (2007))**

Generally research on telework is related to a wider interest by IS in the role of ICT as part of organizing and managing work processes. As telework becomes increasingly possible through the use of mobile ICT and supported by various groupwork technologies, the design and performance of work activities cannot be separated from underlying technologies. While organization studies of work and its management do take into consideration the technological aspects, these studies assume a largely passive role of ICT (Orlikowski and Iacono, 2001). The transforming role of ICT and their increasing implications on everyday work and life, have been an area of concern for IS researchers since the early 1980s (Yoo, 2010). The socio-technical approach to ICT-based organizational changes – dominant until the mid 1990s – promoted a balanced view of technological advancements and workplace implications. However, more recent technological developments, especially the Internet and mobile technologies, and the emerging changes in organizing and transformation of workplaces, have motivated researchers to question the assumption that technology and social actors can be sufficiently understood in themselves (Jones and Orlikowski 2009). Instead technology, work and human actors are understood as entangled and mutually co-constituting, thus questioning the assumption of a two-way bi-directional interaction in traditional socio-technical research (Orlikowski and Scott, 2008). This interwoven character of technology, human actors and work is of particular relevance

for telework research. A first step to better understanding this sociomaterial entanglement of humans and ICT in the context of telework requires a deeper understanding of telework research, especially the literature on the effects of telework.

We thus engaged in a literature review that used the concepts of ‘telework’ and ‘screen work’ as a starting point in searching for publications of relevance to our review. We followed a hermeneutic approach for conducting literature reviews as it enabled us to adjust the review process as a result of the engagement with relevant literatures and subsequent deeper understanding of the research area (Boell and Cecez-Kecmanovic, 2010). For instance, we initially focused on identifying review articles that helped us gain an overview of earlier research and the key concepts in understanding telework. Engaging with this review literature allowed us to further expand into additional publications by extending our search to identify literature using the phrases ‘virtual work’ and ‘mobile work’. In order to ensure building on earlier research in IS we further focused our extended searches on articles published in leading IS journals, which included the AIS senior scholars basket of eight journals plus others, such as *Information and Organization*. We also drew from our own earlier research experience to further expand our coverage of the literature. Furthermore, we identified earlier publications through snowballing of relevant publications and through tracking of citations to highly relevant publications (Boell and Cecez-Kecmanovic, 2010, Webster and Watson, 2002).

### CONCEPTUAL FRAME

Overall our literature review identified 24 different aspects that are of potential relevance in the context of research on the nature and effects of telework (Figure 1). These aspects either describe potential advantages or potential challenges. Furthermore, aspects can be allocated to either an organizational level or the level of an individual employee. We therefore propose a conceptual frame for understanding advantages and challenges of telework as depicted in Figure 1. The following sections will now investigate in more detail the various potential advantages and challenges for organizations and individuals.

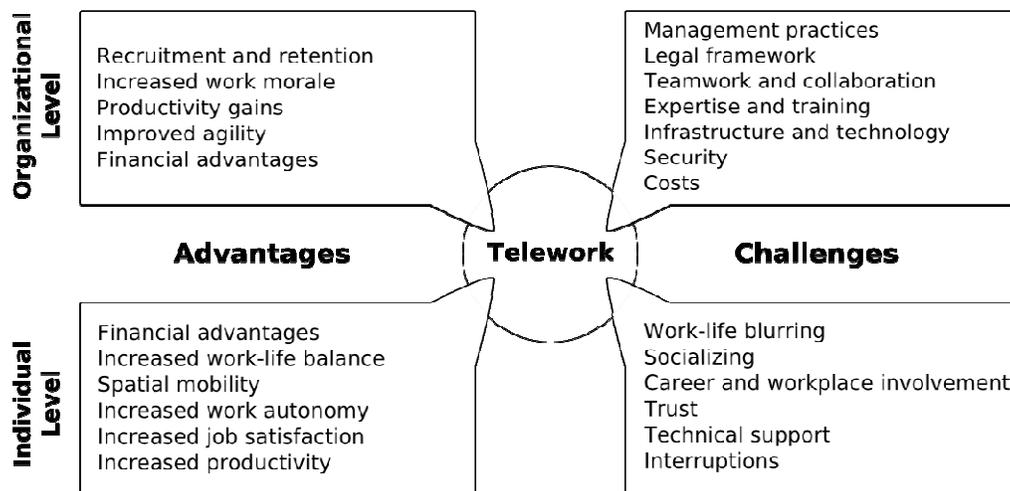


Figure 1: Conceptual frame of potential advantages and potential challenges of telework

#### Potential Advantages - Employee Level

Telework is proposed to have a number of potential advantages for employees. In total, six potential advantages of telework for employees were identified through our literature review (Table 2). Telework enables increasing flexibility in terms of where and when employees can engage with their work. As a result of this increased flexibility workers may be able to lower some of their work related expenses (Kanellopoulos, 2011), such as travel or professional work outfits (Riswadkar and Riswadkar, 2009). They may be able to better coordinate and manage their work commitments in accordance with personal needs or family requirements (Gajendran and Harrison, 2007; Kanellopoulos, 2011; Raghuram and Wiesenfeld, 2004). In addition, spatial mobility can increase the range of places where people are able to engage in their work, such as from remote and rural areas (Baard and Thomas, 2010; Hardill and Green, 2003; Pjöriä, 2011; Simpson et al., 2003). Furthermore, telework can increase the ability of employees to arrange work in accordance to personal preferences (Pearlson and Saunders, 2001), such as establishing work patterns according to personal cycles of productivity. This aspect is in particular of interest in the context of creative work and problem-solving where productivity is highly dependent on an employee's ability to work when they feel that they are most productive or creative (Pjöriä, 2011). Moreover, telework may help employees in increasing their productivity by being able to work in a setting where they can avoid interruptions (Bailey

and Kurland, 2002; Sherry and Salvador, 2002) or by being able to use spare time, such as waiting times or time instead of commuting for engaging with work tasks (Apgar, 1998; Kanellopoulos, 2011; Pjöriä, 2011). Finally, increased ability to self-manage when, where and how to engage with work can contribute towards job satisfaction among employees (Gajendran and Harrison, 2007; Konrad et al., 2003).

Advantage	Description	References
Financial advantage	Employees may incur financial benefits e.g. saving on rent, travel, food, clothing, etc.	Baard and Thomas, 2010; Kanellopoulos, 2011; Riswadkar and Riswadkar, 2009
Increased work-life balance	Telework can contribute towards the ability to coordinate work and non-work tasks.	Donnelly, 2006; Gajendran and Harrison, 2007; Kanellopoulos, 2011; Raghuram and Wiesenfeld, 2004
Spatial mobility	Participation in work is possible from different places, such as rural areas.	Baard and Thomas, 2010; Hardill and Green, 2003; Pjöriä, 2011; Simpson et al., 2003
Increased work autonomy	Teleworkers, have more freedom in how they structure their work.	Campbell and McDonald, 2009; Elsbach, 2003; Gajendran and Harrison, 2007; Pearson and Saunders, 2001; Pjöriä, 2011
Increased productivity	Employees may be able to work in an environment with fewer distractions and use time saved on commuting productively.	Apgar, 1998; Bailey and Kurland, 2002; Gajendran and Harrison, 2007; Kanellopoulos, 2011; Pjöriä, 2011; Sherry and Salvador, 2002
Increased job satisfaction	Increased flexibility to manage when, where and how to work can increase job satisfaction.	Baard and Thomas, 2010; Gajendran and Harrison, 2007; Konrad et al., 2003; Pjöriä, 2011

**Table 2. Potential Advantages at the Individual Level**

### Potential Advantages - Organizational Level

ICT-facilitated and enabled work offers organizations different means to engage with their staff and organize work processes. This can enable organizations to improve human relations issues, increase their efficiency, effectiveness, and optimize their use of resources. In total, five potential advantages of telework for organizations were identified through our literature review (Table 3). As a result of the various potential advantages of telework discussed above, telework can contribute towards improving work morale among employees (Kanellopoulos, 2011), increased job satisfaction as well as enhanced motivation and loyalty among employees (Donnelly, 2006; Pjöriä, 2011). Furthermore, organizations offering the opportunity to engage in telework may appear to be more modern, sustainable, and committed towards the well being of their employees, thus increasing the perception of organizational support (Rhoades and Eisenberger, 2002) and potentially making an employer more attractive to employees (Donnelly, 2006; Kanellopoulos, 2011; Pjöriä, 2011). Telework may thus contribute towards lowering turnover intention among staff members (Ahuja et al. 2007; Gajendran and Harrison, 2007).

Advantage	Description	References
Increased work morale	Organizations may benefit from increased job satisfaction among staff.	Campbell and McDonald, 2009; Donnelly, 2006; Kanellopoulos, 2011; Pjöriä, 2011
Recruitment and retention	Telework can improve an organization's ability to recruit and retain employees.	Ahuja et al. 2007; Donnelly, 2006; Gajendran and Harrison, 2007; Kanellopoulos, 2011; Pjöriä, 2011; Rhoades and Eisenberger, 2002
Productivity gains	Telework may improve the efficiency of organizations in achieving their goals.	Apgar, 1998; Beard and Thomas, 2010; Bailey and Kurland, 2002; Davis, 2002; Kanellopoulos, 2011; Martínez-Sánchez et al., 2007; Sherry and Salvador, 2002
Improved agility	Telework allows access to work related information regardless of time and space.	Campbell and McDonald, 2009; Davis, 2002
Financial advantages	Organizations may be able to incur cost savings, such as in rent, equipment, etc.	Kanellopoulos, 2011; Pjöriä, 2011; Riswadkar and Riswadkar, 2009

**Table 3. Potential Advantages at the Organizational Level**

In addition, telework can have a positive effect on organizational efficiency (Martínez-Sánchez et al., 2007) as employees may be more productive when they can work at times and in a setting where they are subject to less distractions (Baard

and Thomas, 2010; Bailey and Kurland, 2002; Davis, 2002; Kanellopoulos, 2011; Sherry and Salvador, 2002). Organizational productivity may also benefit from minimizing absenteeism due to minor illnesses of dependents (Kanellopoulos, 2011) and employees putting time saved by not commuting into additional work (Apgar, 1998; Baard and Thomas, 2010). Furthermore, telework may improve organizational effectiveness by contributing to organizational agility as it loosens constraints of where, when and how employees can access and communicate work related information (Davis, 2002). Finally, telework can result in financial advantages to organizations (Kanellopoulos, 2011; Pyöriä, 2011) when it lowers costs associated with real estate and utilities (Riswadkar and Riswadkar, 2009).

### Potential Challenges - Employee Level

Loosening constraints of where and when employees can engage in work also poses challenges to employees. These challenges stem mostly from telework's potential to reduce the need for physical presence. In total, six potential challenges of telework for employees were identified in our literature review (Table 4). Different authors have pointed out that telework can lead to an increased blurring of the boundary between work and private life (Baard and Thomas, 2010; Davis, 2002; Olson-Buchanan and Boswell, 2006). As these two spheres become less separated, telework can increase the potential for conflict (Tietze and Musson, 2005), stress and even health problems (Mann and Holdsworth, 2003). In addition, employees may perceive telework as a source of social isolation (Mann and Holdsworth, 2003) as it limits the potential for socializing with colleagues (Baard and Thomas, 2010; Pyörä, 2011) and impedes the ability to build strong social and informal ties with colleagues (Gajendran and Harrison, 2007; Kurland and Cooper, 2002). Also, as telework limits the potential for engaging with colleagues it may have a negative effect on career progression (Kurland and Cooper, 2002; McCloskey and Igbaria, 2003) as employees have less opportunity to network and assess their performance against their colleagues (Baard and Thomas, 2010, Pyöriä, 2011). Similarly, it is argued that the lack of face-to-face communication may also inhibit the ability to develop trust (Gajendran and Harrison, 2007; Pyöriä, 2011) and may contribute towards colleagues and superiors questioning the teleworker's loyalty (McCloskey and Igbaria, 2003). Moreover, being usually heavily dependent on ICT for conducting their work, workers may be challenged by having to face technical problems on their own (Scholefield and Peel, 2009). Finally, workers may be more subject to interruptions when teleworking (Davis, 2002; Sherry and Salvador, 2002).

Challenge	Description	References
Work-life blurring	The boundary between work and non-work may become more permeable.	Baard and Thomas, 2010; Davis, 2002; Fonner and Stache 2012; Mann and Holdsworth, 2003; Olson-Buchanan and Boswell, 2006; Standen et al., 1999; Tietze and Musson, 2005
Socialization	Telework may decrease the potential for social and informal interactions with colleagues.	Baard and Thomas, 2010; Gajendran and Harrison, 2007; Kurland and Cooper, 2002; Mann and Holdsworth, 2003; Pyörä, 2011;
Career and workplace involvement	Employees can feel more distant from their workplace and what is going on in the office.	Baard and Thomas, 2010; Gajendran and Harrison, 2007; Kurland and Cooper, 2002; McCloskey and Igbaria, 2003; Pyöriä, 2011
Trust	Fewer face-to-face interactions with others may reduce trust.	Gajendran and Harrison, 2007; McCloskey and Igbaria, 2003; Pyöriä, 2011
Technical support	When facing technical problems the ability to receive direct technical support is reduced.	Scholefield and Peel, 2009
Interruptions	Telework can increase the potential of unwanted interruptions.	Davis, 2002; Sherry and Salvador, 2002

**Table 4. Potential Challenges at the Individual Level**

### Potential Challenges - Organizational Level

Telework also poses several challenges to organizations and management. In total, seven potential challenges of telework for organizations were identified in our literature review (Table 5). First, telework may challenge managers and their traditional perception of management and leadership styles as they lose direct control over checking how and how long employees work (Pearlson and Saunders, 2001; Pyöriä, 2011). Telework is therefore associated with change in management style away from instruction based management and towards management by objective (Konrad et al., 2003; Kurland and Cooper, 2002).

Hence, telework may be seen as reducing the need for middle management for supervision (Pyöriä, 2011). Management may thus be reluctant to adopt telework in organizations (Pearlson and Saunders, 2001; Scholefield and Peel, 2009).

Challenge	Description	References
Management practices	Management style needs to shift away from direct supervision to management by objectives.	Kurland and Cooper, 2002; Pearlson and Saunders, 2001; Pyöriä, 2011; Scholefield and Peel, 2009
Legal framework	Telework may be associated with legal uncertainties for organizations.	Helle, 2006; Pyöriä, 2011
Teamwork and collaboration	Working with others and building of implicit shared knowledge can be hindered.	Brodt and Verburg, 2007; Donnelly, 2006; Pearlson and Saunders, 2001; Pyöriä, 2011
Expertise and training	Organizations and their staff may need specific expertise for engaging in telework.	Brodt and Verburg, 2007; Kurland and Cooper, 2002
Infrastructure and technology	Telework requires sufficient infrastructure at both ends and in-between.	Scholefield and Peel, 2009
Security	Access to data and communication from outside an organization need to be secure.	Pyöriä, 2011; Riswadkar and Riswadkar, 2009
Costs	Setting up of telework requires upfront investment in technology and people.	Pjörriä, 2011

**Table 5. Potential Challenges at the Organizational Level**

Second, telework may be associated with potential legal uncertainties such as developing occupational health and safety frameworks in accordance with national labor legislation (Helle, 2006; Pyöriä, 2011). A third challenge to organizations is the organization of teamwork and the facilitation of interaction among employees (Brodt and Verburg, 2007; Pearlson and Saunders, 2001; Pyöriä, 2011). The challenges here are: how work with others can be efficiently organized when some members of a team are not physically present; how the sharing and transfer of implicit knowledge among employees can be facilitated; and how jealousy and misunderstanding can be avoided, particularly when telework is seen as a privilege (Donnelly, 2006). Telework can also require organizations to obtain additional expertise in the setting up and use of necessary ICT infrastructure (Brodt and Verburg, 2007; Kurland and Cooper, 2002). Organizations may need to set up and maintain adequate ICT infrastructure at the organization end, at the end of the employees, and in-between (Scholefield and Peel, 2009). Furthermore, telework can also pose a challenge to information security as ICT used by workers is physically outside the organization (Pyöriä, 2011; Riswadkar and Riswadkar, 2009). Finally, organizations need to make upfront investments, and providing IT support to telework staff may be more costly than providing on-site IT support (Pjörriä, 2011).

## **CONTRADICTIONS IN ICT-ENABLED WORK – FUTURE RESEARCH OPPORTUNITIES**

From the above review of potential advantages and challenges of telework arises a picture that is partially contradictory and unclear in regards to its potential for individuals and organizations. In this section, we point out some of these contradictions in the literature. By doing this we show that the conceptual frame that we have introduced here not only provides an overview of issues in current research, which may be used for developing more formal conceptual models and hypotheses, but also show that our review outlines potential areas for future research associated with a more thorough engagement with contradictions apparent in the literature. These contradictions can appear either within levels or between levels, as the following four contradictions exemplify.

### **Contradictions at the employee level**

A first contradiction in the literature arises from the claim that individuals enjoy fewer interruptions at home and may have increased job satisfaction (Gajendran and Harrison, 2007; Konrad et al., 2003). However, it is also argued that employees may be subject to more distractions and social isolation when working away from an office. As indicated above, work places are busy environments where employees may be interrupted by colleagues at any time, thus reducing their ability to concentrate on their work and potentially inhibiting their productivity. At the same time authors have also argued that there may be more distractions at home than there are in the workplace and that working from home may actually decrease work satisfaction due to a feeling of social isolation (Mann and Holdsworth, 2003; Pyöriä, 2011). This could be especially

pertinent if the teleworker is working from home while simultaneously looking after young children, elderly relatives or a sick partner.

### **Contradictions at the organizational level**

A further contradictory example can be observed at the organizational level where claims are made that telework can reduce costs for organizations (Kanellopoulos, 2011; Pyöriä, 2011; Riswadkar and Riswadkar, 2009), while at the same time the ability to engage in telework does not come for free. There are upfront investments to be made in order to provide the required ICT infrastructure, to put adequate ICT security measures in place, to have ICT staff with the right expertise, and potential training that is necessary for staff to engage in telework. As all these investments have to be made upfront; they are associated with a potential risk that has to be judged against potential cost savings in the long run.

### **Cross-level contradictions between employees and organizations**

Of particular interest are cross-level contradictions where proposed advantages and challenges point into different directions for employees and organizations. One such challenge to successful engagement in telework is capturing the advantages of increased autonomy for individuals in planning work according to their own pace and productivity cycles (Elsbach, 2003; Gajendran and Harrison, 2007; Pearlson and Saunders, 2001; Pjöriä, 2011), while at the same time facilitating teamwork and collaboration (Brodt and Verburg, 2007; Donnelly, 2006; Pearlson and Saunders, 2001; Pyöriä, 2011). The contradiction arises on the one hand, from increased autonomy for an individual employee, while on the other, organizations need to manage telework so that teamwork and collaboration can be facilitated and productively performed (Donnelly, 2006; Pearlson and Saunders, 2001). That is, as autonomy and flexibility increases for employees, agility and adaptability can decrease for organizations. If workers are not collocated, the ability for informal and ad-hoc exchange between members of a team are limited. For instance, it is simply not possible to resolve an issue by asking a colleague at the neighboring desk nor is it easily possible to learn on the job from more experienced colleagues through observation and informal story telling.

### **Future Research**

As the literature review presented above indicates, there is a clear need for IS researchers to gain a better understanding of advantages and challenges associated with telework, and how these are interrelated, contradicting and influencing each other for different stakeholders. For example, researchers should seek to gain a deeper understanding of contradictions identified here as well as others. Our examples also highlight the fact that there can be intra-level or inter-level contradictions, which point out the importance of engaging in research that looks beyond only a single level, as advantages for organizations may be challenges to employees and vice versa. Furthermore, it is more than likely that different aspects are related, potentially moderating or mediating each other; and that new challenges and advantages emerge as technology evolves (Yoo, 2010). Hence there is potential for future research to engage in investigating interrelationships between the identified aspects.

Furthermore, these contradictions underline that future research is needed that engages more broadly with telework as to gain a better understanding on how new challenges and advantages arise through ICT. In particular it seems that positivist methods, currently dominating research on telework, need to be complemented by in-depth qualitative studies on how the nature of work is transformed through ICT and how these changes are understood and perceived by employees and managers. And finally it is important for IS to better understand how ICT can be developed in a way that facilitates positive effects of ICT for organizations and their employees while seeking to overcome challenges that may be arising from the design of ICT.

A particular opportunity for future research on the nature of telework in numerous implication discussed above arises from a sociomaterial approach that is gaining prominence in IS (Orlikowski and Scott, 2008). The profound changes in work processes and employee engagement emerging through the appropriation of ICT (that are themselves continually evolving) can be traced and studied by focusing on their entanglements. The sociomaterial approach promises to help us develop new insights into the visible and not so visible advantages and challenges of telework for individuals and organizations.

### **CONCLUDING DISCUSSION**

Telework is pushing the boundaries of when and where it is possible to engage in work. Telework is not simply providing additional spatial mobility or temporal flexibility, it changes the nature of work itself and human engagement in work processes. Importantly, this change is associated with potential advantages and challenges for employees and their organization. We made a contribution to this phenomenon by conducting a literature review which identified 24 different aspects associated with potential advantages and challenges of telework.

One theoretical implication of our research arises from its identification of potential contradictions among the aspects we identified. It thus provides one possible explanation for the slower than anticipated adoption of telework (Pearlson and Saunders, 2001; Pjöriä, 2011). Potential outcomes of telework cannot be understood by simply stacking up potential positive outcomes and potential negative ones against each other (Jarvenpaa and Lang, 2005). In contrast, research on advantages and challenges of telework seem to be interrelated and contradictory. It is therefore necessary to develop a deeper understanding of these contradictions to better comprehend the adoption, or lack thereof, of telework.

A further contribution of our review is that it can guide researchers in the development and formulation of research questions and hypotheses. The different potential outcomes of telework identified here reveal that multiple aspects are of relevance in this context. It therefore provides a foundation for future research by highlighting aspects that can be looked at further. This may include looking at individual aspects and their potential interrelation with other aspects.

There are also further possibilities for future research by engaging with areas not covered by this review. For instance, there are indicators that outcomes of telework are at least partially dependent on the type of work done (Haddon and Brynin, 2005; Hislopp and Axtell, 2007). Differences in the type of work done may be important to better understand under what circumstances telework may unfold potential challenges and advantages for employees and organizations. For instance, contingent upon the type of work done, there may be clearer boundaries between work and private life for some professions, hence less potential for work-life conflict to arise from the use of telework (Hislopp and Axtell, 2007). Research that predominantly focuses on individual factors in the context of telework, however, can have a limited potential for uncovering yet unknown and complex interrelationships. It seems therefore necessary for IS to also embark upon research employing methodologies that enable a deeper conceptual engagement of how telework is contributing, mediating or facilitating the changing sociomaterial nature of work through the use of ICT (Yoo, 2010).

From a practice perspective, two implications of our research can be highlighted. Firstly, our review indicates that telework is associated with considerable challenges for management. Telework requires managers to establish different ways of supervising and assessing the performance of subordinates. In particular management is restricted in its ability to directly supervise activities of subordinates. Instead management needs to identify objectives that can be allocated to individual employees. It remains an open question how organizations can enact a shift in management style away from management by instruction towards management by objective that is suitable for telework (Konrad et al., 2003; Kurland and Cooper, 2002). Such a shift in management style is particularly challenging for middle management as it at the same time provides a means that potentially reduces the need for middle management itself (Pearlson and Saunders, 2001). Secondly, by pointing out potential challenges of telework, strategies can be devised in order to minimize these drawbacks. For instance, by developing a legal framework, all partners clearly know their entitlements and obligations, thus employees can have clear guidelines as to how their performance is assessed. Hence employees have a benchmark against which their career progression will be judged, while at the same time organizations can have legal security and a means for holding employees accountable. How such legal frameworks enable and stimulate the adoption of telework, realization of its advantages and resolution of challenges, is yet another research problem that research on telework should address.

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## REFERENCES

1. Ahuja, M.K., Chudoba, K.M., Kacmar, C.J., Mcknight, D.H. and George, J.F. (2007) IT Road Warriors: Balancing Work-Family Conflict, Job Autonomy, and Work Overload to Mitigate Turnover Intentions, *MIS Quarterly*, 31, 1, 1–17.
2. Apgar, B.Y.M. (1998) The Alternative Workplace: Changing Where and How People Work, *Harvard Business Review*, 76, 3, 121–136.
3. Baard, N. and Thomas, A. (2010) Teleworking in South Africa: Employee Benefits and Challenges, *SA Journal of Human Resource Management*, 8, 1, 1–18.
4. Bailey, D.E. and Kurland, N.B. (2002) A Review of Telework Research: Findings, New Directions, and Lessons for the Study of Modern Work, *Journal of Organizational Behavior*, 23, 4, 383–400.
5. Boell, S.K. and Cecez-Kecmanovic, D. (2010) Literature Reviews and the Hermeneutic Circle, *Australian Academic and Research Libraries*, 41, 2, 129–144.
6. Brodt, T.L. and Verburg, R.M. (2007) Managing Mobile Work — Insights from European Practice, *New Technology, Work and Employment*, 22, 2, 52–65.

7. Bødker, M., Gimpel, G. and Hedman, J. (2012) Time-out/Time-in: The Dynamics of Everyday Experiential Computing Devices, *Information Systems Journal*, early view.
8. Campbell, J. and McDonald, C. (2009) Defining a Conceptual Framework for Telework and an Agenda for Research in Accounting and Finance, *International Journal of Business Information Systems*, 4, 4, 387-402.
9. Davis, G.B. (2002) Anytime/Anyplace Computing and the Future of Knowledge Work, *Communications of the ACM*, 45, 12, 67–73.
10. Dixon, K.R. and Panteli, N. (2010) From Virtual Teams to Virtuality in Teams, *Human Relations*, 63, 8, 1177–1197.
11. Donnelly, R. (2006) How “Free” is the Free Worker?: An Investigation into the Working Arrangements Available to Knowledge Workers, *Personnel Review*, 35, 1, 78–97.
12. Elsbach, K.D. (2003) Relating Physical Environment to Self-Categorizations: Identity Threat and Affirmation in a Non-Territorial Office Space, *Administrative Science Quarterly*, 48, 4, 622–654.
13. Fonner, K. L., and Stache, L. C. (2012) All in a Day’s Work, at Home: Teleworkers' Management of Micro Role Transitions and the Work-Home Boundary, *New Technology, Work and Employment*, 27, 3, 242–257.
14. Gajendran, R.S. and Harrison, D.A. (2007) The Good, the Bad, and the Unknown About Telecommuting: Meta-Analysis of Psychological Mediators and Individual Consequences, *The Journal of Applied Psychology*, 92, 6, 1524–41.
15. Garrett, R. K., and Danziger, J. N. (2007) Which Telework? Defining and Testing a Taxonomy of Technology-Mediated Work at a Distance, *Social Science Computer Review*, 25, 1, 27–47.
16. Haddon, L. and Brynin, M. (2005) The Character of Telework and the Characteristics of Teleworkers, *New Technology, Work and Employment*, 20, 1, 34–46.
17. Hardill, I. and Green, A. (2003) Remote Working — Altering the Spatial Contours of Work and Home in the New Economy, *New Technology, Work and Employment*, 18, 3, 212–222.
18. Helle, M. (2006) New Forms of Work in Labour Law. in J.E. Andriessen and M. Vartiainen (Eds.), *Mobile Virtual Work. A New Paradigm?*, Berlin: Springer, 71–93.
19. Hislop, D. and Axtell, C. (2007) The Neglect of Spatial Mobility in Contemporary Studies of Work: The Case of Telework, *New Technology, Work and Employment*, 22, 1, 34–51.
20. Jarvenpaa, S.L. and Lang, K.R. (2005) Managing the Paradoxes of Mobile Technology, *Information Systems Management*, 22, 4, 7–23.
21. Jones, M., and Orlikowski, W. J. (2009) Information Technology and the Dynamics of Organizational Change, in Roger Silverstone, Danny Quah, Chrisanthi Avgerou, Robin Mansell (Eds) *The Oxford Handbook of Information and Communication Technologies*, Oxford: Oxford University Press, 293–313.
22. Kanellopoulos, D.N. (2011) How Can Teleworking be Pro-poor?, *Journal of Enterprise Information Management*, 24, 1, 8–29.
23. Konradt, U., Hertel, G. and Schmook, R. (2003) Quality of Management by Objectives , Task-related Stressors as Predictors of Stress and Job Satisfaction Among Teleworkers, *European Journal of Work and Organizational Psychology*, 12, 1, 61–79.
24. Kurland, N.B. and Cooper, C.D. (2002) Manager Control and Employee Isolation in Telecommuting Environments, *Journal of High Technology Management Research*, 13, 107–126.
25. Ling, R. (2008) *New Tech, New Ties. How Mobile Communication is Reshaping Social Cohesion*, Cambridge: MIT Press.
26. Mann, S. and Holdsworth, L. (2003) The Psychological Impact of Teleworking: Stress, Emotions and Health, *New Technology, Work and Employment*, 18, 3, 196–211.
27. Martínez Sánchez, A., Pérez Pérez, M., De Luis Carnicer, P. and Jiménez, M.J.V. (2007) Teleworking and Workplace Flexibility: A Study of Impact on Firm Performance, *Personnel Review*, 36, 1, 42–64.
28. McCloskey, D.W. and Igarria, M. (2003) Does “Out of Sight” Mean “Out of Mind”? An Empirical Investigation of the Career Advancement Prospects of Telecommuters, *Information Resources Management Journal*, 16, 2, 19–34.
29. Olson-Buchanan, J.B. and Boswell, W.R. (2006) Blurring Boundaries: Correlates of Integration and Segmentation Between Work and Nonwork, *Journal of Vocational Behavior*, 68, 3, 432–445.
30. Orlikowski, W. J., and Iacono, C. S. (2001) Research Commentary: Desperately Seeking the ‘IT’ in IT Research - A Call to Theorizing the IT Artifact, *Information Systems Research*, 12, 2, 121–134.

31. Orlikowski, W. and Scott, S. (2008) Sociomateriality: Challenging the Separation of Technology, Work and Organization, *The Academy of Management Annals*, 2, 1, 433–474.
32. Pearlson, K.E. and Saunders, C.S. (2001) There's No Place Like Home: Managing Telecommuting Paradoxes, *The Academy of Management Executive*, 15, 2, 117–128.
33. Pyöriä, P. (2011) Managing Telework: Risks, Fears and Rules, *Management Research Review*, 34, 4, 386–399.
34. Raghuram, S. and Wiesenfeld, B. (2004) Work-Nonwork Conflict and Job Stress Among Virtual Workers, *Human Resource Management*, 43, 2-3, 259–277.
35. Rhoades, L. and Eisenberger, R. (2002) Perceived Organizational Support: A Review of the Literature, *Journal of Applied Psychology*, 87, 4, 698–714.
36. Riswadkar, A. and Riswadkar, A.V. (2009) Balancing the Risks of Remote Working: Walking the Telecommuting Line, *The John Liner Review*, 23, 2, 1–5.
37. Scholefield, G. and Peel, S. (2009) Managers' Attitudes to Teleworking, *New Zealand Journal of Employment Relations*, 34, 3, 1–13.
38. Schweitzer, L. and Duxbury, L. (2010) Conceptualizing and Measuring the Virtuality of Teams, *Information Systems Journal*, 20, 3, 267–295.
39. Sherry, J. and Salvador, T. (2002) Running and Grimacing: The Struggle for Balance in Mobile Work, in B. Brown, N. Green and R. Harper (Eds.), *Wireless World: Social and Interactional Aspects of the Mobile Age*, London: Springer, 108–120.
40. Simpson, L., Daws, L., Pini, B. and Wood, L. (2003) Rural Telework: Case Studies from the Australian Outback, *New Technology, Work and Employment*, 18, 2, 115–126.
41. Smith, H.A. and McKeen, J.D. (2011) Enabling Collaboration with IT, *Communications of the Association for Information Systems*, 28, Article 16.
42. Standen, P., Daniels, K., and Lamond, D. (1999) The Home as a Workplace: Work-Family Interaction and Psychological Well-Being in Telework, *Journal of Occupational Health Psychology*, 4, 4, 368–381.
43. Tietze, S. and Musson, G. (2002) When “Work” Meets “Home”: Temporal Flexibility as Lived Experience, *Time and Society*, 11, 2/3, 315–334.
44. Wang, Y. and Haggerty, N. (2011) Individual Virtual Competence and Its Influence on Work Outcomes, *Journal of Management Information Systems*, 27, 4, 299–334
45. Webster, J. and Watson, R.T. (2002) Analyzing the Past to Prepare for the Future: Writing a Literature Review, *MIS Quarterly*, 26, 2, xiii–xxiii.
46. Yoo, Y. (2010) Computing in Everyday Life: A Call for Research on Experiential Computing, *MIS Quarterly*, 34, 2, 213–231.