VIRTUAL MANAGERS' PERSPECTIVE ON ADOPTION OF NEW WORK FORMS – CASE OF ESTONIAN SERVICE SECTOR

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ABSTRACT

ICTs have changed the way people interact with each other – not only in everyday situations, but also in the work context. Inevitably, managers need to develop their management techniques to suit the new ICT-mediated communication reality. As it has been suggested that new flexible work forms (virtual work, distance work) are more suitable for service organisations, the current paper aims to better understand new managerial practices used by virtual service managers and aspects that hinder the widespread use of new work forms. Thirty six service managers representing all twelve subsectors of the Estonian service industry were interviewed. Results indicate that flexible work forms, namely virtual work, is used more extensively than distance work. As the general knowledge level of new work forms and suitable management techniques is low, joint efforts of different societal interest groups are needed in order to raise awareness of new work forms.

INTRODUCTION

The 21st century has seen a drastic rise in the adoption of new technologies. The use of different information and communication technologies (ICT) has started to influence not only everyday life, but also work processes, paving the way for an array of new work forms to be adopted. As ICT-mediated communication opens up several new ways for humans to interact, the new ways of communicating also pose several new challenges for employees and employers alike. New virtual context of work, where face-to-face interaction and relationship building has been replaced by ICT-mediated communication, leads to a necessity to develop management techniques suitable for the new work context reality.

Another trend that managers need to address and acknowledge, in addition to ICT, is the shift from a manufacturing to an information society characterized

by information sharing which is becoming a life norm, and new business models being developed in the service sector. Service management, service dominant logic and service design are just a few keywords that have gained momentum over the past two decades. As several trends that emerge simultaneously usually have a common root cause, it has become evident that the development of ICT has made many of the developments discussed in this paper possible and also driven the speed of change in society. Thus, ICT-mediated communication changes are not a fading trend, but a permanent shift to a new work and managerial reality where changes in management techniques used should also be observable.

Compared to products, services have been characterized as being intangible, perishable, heterogeneous and inseparable (Zeithaml, Parasuraman & Berry, 1985). The intangible nature of services poses the need to establish credibility with potential customers as it is more likely to lead to trial and purchase (Hooley et al., 2003). Inseparability that denotes involvement of customers in the production process stresses the importance of insight into customer needs and expectations – bringing customer relationship management, trust and communication management as key issues to the forefront of any service organization. Customer service representatives and employee behaviour in general (including being perceived trustworthy) is largely determined and influenced by managerial behaviour, communication skills and leadership (Aitken & Treuer, 2014; Kellis & Ran, 2015). For example, it has been shown that transformational leadership leads to better service quality (Jabnoun & Rasasi, 2005). Thus, service sector managerial behaviours need special attention and further research attention. Currently research on virtual work and related managerial behaviours has either been conducted based on case studies or the service sector has not been distinguished from other sectors, thus, making this paper's contribution a valuable one to the growing body of virtual work and service management literature.

The services sector in developed countries has been dominating and growing for several decades (making up 70-80% of GDP), but the transition economies have traditionally been focusing mainly on agricultural and/or manufacturing sectors. Rapid growth of the service sector in the transition economies started mainly in 1990s, providing infrastructure for market based economies (Hooley et al., 2003). In 2014, 43% of Estonian enterprises operated in the service sector and approximately 25% of the value added of Estonian enterprises was created in the service sector. The value added generated in the sector amounted to 2.9 billion euros, which was 8% more than in 2013 and 45% more than in 2010 (Estonian Statistical Yearbook, 2016). The question raises how much of the growth in the service sector organizations is achieved by deliberate and knowing changes initiated by managers and how much of it is organic. Rapid growth in changing market conditions is posing challenges for managers and subordinates alike and Estonian

statistics show it to be a suitable context for virtual work adoption research. This paper aims to better understand virtual management techniques adopted by virtual managers working in service organisations.

LITERATURE REVIEW

Although there is a huge array of terms used in depicting new work forms including telework, distance work, remote work, e-work, the current paper uses "virtual work" as the main term as it describes the phenomenon on its fundamental level. Virtual work refers to people working in different geographical locations, using ICT to manage business processes (Depickere, 1999; Desanctis & Monge, 1998; Hoeffling, 2001; Humala, 2015). Over the decades – starting from Nilles in 1973 (Nilles, 1998) – the discussion has shifted from virtual teamwork context describing virtuality in broader organizational context (Jarvenpaa & Laidner, 1999; Maznevski & Chudoba, 2000; Klitmoller, Schneider & Jonsen, 2015) to advancing the idea to organizational networks (Potter, Cooke & Balthazard, 2004; Lipnack & Stamps, 2000). In the evolutional process of virtual work literature, two broad topics have emerged and remained the central focal points – location of work and use of ICT for co-operation. As the use of ICT for communication has proven to be the main reason behind challenges encountered by virtual managers (Kirkman & Mathieu, 2005) and virtual workers, the ICT-mediated communication discussion (Palvalin, Lonngvist & Vuolle, 2013; Rios & Jimenez, 2015) has gained momentum.

In addition to gain stemming from the use of virtual work, managers also face several challenges when introducing virtual work as the new modus operandi. One central theme in virtual work literature is trust: within-team trust is especially important in virtual teams as other mechanisms used to observe, monitor, and control partners are absent (Aubert & Kelsey, 2003). Building trust and a sense of belonging, necessary for open exchange and sharing, may be much more difficult using ICT-mediated interaction than face-to-face mode (Handy, 1995; Hildreth, Kimble & Wright, 2000). Heavy reliance on technology for interaction and communication requires proficiency across a wider range of technologies. Lack of knowledge among employees about virtual work in addition to lack of knowledge among some senior mature managers concerning advanced technological applications, generally deepen problems (Bergiel, Bergiel & Balsmeier, 2008). According to Joinson (2002), some people "who are stimulated by interaction with other people or who need external structure to stay on track may be unsuccessful in a virtual environment". Cascio (2000) asserts that there are five main disadvantages to working virtually: lack of physical interaction, loss of face-to-face synergies, lack of trust, greater concern with predictability and reliability, and lack of social interaction.

As the virtual context is different, new types of knowledge and habits are required

from both managers and workers. Work can consume every waking hour if care is not taken to separate work time from home time (Barron, 2007), thus time management skills become crucial. Organisations expect their employees to develop a high level of self-reliance and self–organisation (Wagner & Kompanst, 1998). Some people are not suited for virtual work or may experience heightened level of stress and anxiety if forced to do so. Not all types of work are suited for performing virtually. Researchers have suggested that virtual work is eminently suitable for jobs that deal with intangibles: service-based rather than production-based, knowledge rather than craftsmanship; information rather than raw materials, networking rather than physical facilities. Positions described as ideal for virtual work include those with extensive customer interaction, such as sales, customer service and insurance claims representatives (Whalen & Wright, 1998). Thus, service organization - managers and processes - as well as future virtual workers need to be carefully prepared in order to remain productive in the virtual environment.

Nilles (1998) suggests that in order to successfully manage virtual workers, old (control oriented) management techniques need to be replaced by techniques known as management by objectives. The culture of self-organisation and self-reliance expected from virtual workers is reflected in the trend of output-oriented reward structures (employees are not primarily paid for the time they work but for the results they produce) and the deregulation of (formerly strict) working time arrangements (Wagner & Kompanst, 1998). Two types of formal supervisory controls are used in service organisations – output control and process (behaviour) control. Output control specifies output goals and standards (work methods are left for the employee to decide) and it is considered a better fit for virtual work environment (for example as the criteria for tasks completed, finished product) (Ogilvie, 1994). In the virtual environment managers are not able to observe attendance, attitude and appearance of working hard, personality and style (Johnson, Heimann & O'Neill, 2001) – thus, behavioural (process) control is likely not feasible in such an environment.

Virtual workers require more feedback on performance from a formal appraisal system (compared to non-virtual workers), as they are not closely monitored and subsequently get less informal feedback from supervisors (Dobbins, Cardy & Platz-Vieno, 1990).
As client and other contextual aspects that are not controllable by service personnel play an important role in providing high quality service, relying solely on output control measures may not be appropriate or sufficient in service organisations (Bowen & Schneider, 1985). Thus, a combination of behavioural and output-based performance evaluation criteria is perceived as fair and should be used for virtual service workers. The table found in Appendix A gives an overview of the main virtual work related topics emerging from the literature and they are a basis for empirical research in the current paper.

The following aspects are specific to and suggested techniques of virtual management:

- establishing ICT-mediated communication rules;
- choosing the right mix of ICTs;
- results-oriented performance management and assessment;
- virtual manager's personality traits need to match virtual context specifics;
- developing virtual organizational culture – fostering trust, teambuilding and combating perceived isolation;
- human resource management - training in the area of technological, personal and inter-personal skills;
- leadership style – shared/distributed/transformational leadership.

More recent research concentrates on comparing hierarchical leadership versus shared/distributed leadership's suitability for virtual work. A popular way for distinguishing leadership styles is the transformational–transactional styles framework (Burns, 1978). Findings indicate that a higher level of transformational leadership leads to virtual group effectiveness (Sosik, Kahai & Avolio, 1998; Hoyt & Blascovich, 2003). Gibbs, Sivunen & Boyraz (2017), a conclusion based on meta analysis of 265 articles published over a period of 15 years of literature on leadership in virtual teams that can be broadly divided into two sub-categories: strong and emergent. "Strong" leadership assumes that due to virtual teams' boundary spanning and complex nature (compared to face-to-face teamwork), formal, vertical leadership styles are more suitable. "Emergent" leadership is considered the best if team members are randomly assigned and have no pre-existing relationships with one another – usually the team starts out with no designated leader or larger organizational structure to support it. In this situation, leadership emerges naturally as team members start interacting and taking turns sharing the leader's role based on assignment specifics.

Studies exploring special skills and competencies required for effective virtual leadership have received very little attention and virtual work research is still maturing and struggling with empirical and conceptual issues (Schweitzer and Duxbury, 2010). In spite of decades-long research investigating different aspects of leadership in the virtual context, the knowledge is still rather limited (Malhotra, Majchrzak & Rosen, 2007; Wakefield, Leidner & Garrison, 2008; Mukherjee, Lahiri, Mukherjee & Billing, 2012; Dulebohn & Hoch, 2017). Virtual work has been shown to have positive outcomes for organisation and workers, but organisations need to balance the reasons for using virtual work – the right reasons are driven by employee and customer needs before organisational needs (for example, cost reduction). Virtual work is not a cure against all organisational problems (Whiting, 1997; Johnson, Heimann & O'Neill 2001). It can be an effective tool for improving service delivery, if aligned with customer-driven service standards

while extensively considering virtual employees' aspects.

METHODOLOGY

Virtual work is studied using a number of methodologies and themes. The most used methodologies are case studies, experiments and surveys (quantitative and qualitative). As Ledwith and Ludden (2016) point out: "Key topics using case study research are communication and leadership. Experimental or laboratory experiments tend to focus on the communication, cultural, and leadership aspects of virtual teams. Qualitative research uses interviews, study team challenges, culture, and team structure, while quantitative research uses surveys that focus mostly on dispersion, team effectiveness, and performance, as well as on traditional versus virtual teams." As managerial issues are relatively less studied and require deeper insight, qualitative inquiry was chosen for data gathering in this study. Individual interviews were conducted with 36 service managers who have had at least three years of experience leading a group/team/department of virtual workers. Each interview lasted from 60 to 90 minutes and content analysis was conducted later.

Table 1: Service Sectors Represented by 36 Interviewed Service Managers

No.	EMTAK classification	Service sector
1	G	Wholesale and retail business
2	H	Logistics
3	I	Accommodation and catering
4	J	Information and telecommunication
5	K	Financial services, insurance
6	L	Real estate business
7	M	Vocational, scientific and technological activities
8	N	Public administration and support services
9	O	National defence, compulsory social insurance
10	P	Education
11	Q	Healthcare and social services
12	R	Art, entertainment and free time

As the theoretical overview suggested – virtual work is more suitable and a relatively more commonly used work practice in the service sector – managers working in service organizations were chosen for the interviews. The managers chosen were from all the different service subsectors in Estonia and thus, the sample represented the opinions of service managers covering the industry.

In order to cover different fields of activities, EMTAK version 2008 was used (see Table 1).

EMTAK (Estonian Classification of Economic Activities) is an Estonian national version of NACE Rev.2 (Statistical Classification of Economic Activities in the European Community). EMTAK 2008's field of activities' structure follows the same logic as NACE Rev.2. Three virtual managers from every field of activity were interviewed; in total, 36 interviews were conducted.

RESULTS AND DISCUSSION

Virtual managers interviewed described their work as a blend of virtual work (using ICT) and distance work (locational flexibility) (see Table 2). There was no usual work day, but as a trend, many started the work day by checking their e-mail account and replying e-mails which took approximately one hour before doing other work assignments. Virtual work was allowed for managers and specialists due to work assignments that required their mobility (for example, business trips). Overall, it appeared that mobile workers for example, sales people, consultants, law enforcement officers were allowed locational flexibility as a natural part of the work process; other occupational job groups workers needed to consult and agree on the time/place flexibility with the manager in advance (for example, one manager required one week's notice from workers who planned to work a day from home; others accepted shorter notice). Usually virtual workers who did not work in the office worked at home. None of the virtual managers reported the use of distance work centres/telecentres. Virtual managers accepted the need to work from home, but the virtual worker was required to provide a reasonable explanation for the decision (for example, illness, quality of work is higher in a tranquil environment). Thus, virtual work is known and practiced (using ICT), but distance work as an everyday work practice or virtual work for longer periods of time, tends to be more of an exception than a rule. The terms "virtual work" and "distance work" needed to be explained first as managers could relate to them after descriptions and examples were given, but the terminology was usually perceived as new.

Table 2: Virtual Work Described by Virtual Managers (n=36)

Questionnaire item and topic	Main results
1.1 Job groups and virtual work specifics	No typical work days, but most start the day with checking e-mails
	Manager-subordinate work with lower degree of virtuality than manager-manager
	One face-to-face weekly meeting with subordinates as a rule (usually Monday); if not possible, video conferencing is used
	Virtual work is caused due to location (working in different cities/buildings), big number of subordinates or mobile work nature (e.g. real estate agents, social work consultants)
1.2 Work location	If other than office - home, other work related object (e.g. school, real estate object etc.)
	All virtual workers have an office provided by the organisation
	Distance work centers are not used
	Distance work tends to be exception not a rule and needs special agreement with the manager; except mobile workforce (e.g.real estate agents, police officers)
1.3; 1.5 Virtual work adoption	Natural development due to ICT's development and usage trend in society - not a deliberate project initiated by the manager or subordinates
	Organisational culture has been supporting (e.g. "academic freedom" in universities - locational and time flexibility)
	Virtual/distance work unacknowledged (as formal terms), but used
	ICT's use mainly started around 2000, over past 10 years deliberate systems development
	All organisations have an IT specialist on payroll
1.4 Types of work assignments/ areas of work	Virtual/distance work suits intellectual work, preparation of work, scientific and creative work, assignments that need full concentration
	Virtual/distance work does not suit: conflict management, problem solving, relationship development
	Virtual work is not alternative to face-to-face work, but supporting it

Virtual work has emerged in the Estonian service sector organisations over the past 15 years and has been acknowledged by managers to some extent, more specifically over the past 10 years. Adoption of virtual work has been due to the widespread use of different ICTs (mainly personal computers and mobile devices) and development of Internet connections (also at workers' homes). As this development has happened over a period of several years, organisations have transitioned into the use of ICT for work purposes gradually but virtual work has not been acknowledged or introduced as a deliberate change project of work processes. Managers have started to pay more attention to workers' need for ICT-related support over the past 5 to 10 years – now all of the interviewed

organisations have IT specialist(s) as member(s) of their permanent staff. Newly recruited workers are offered ICT-related consultations and in some cases, assigned a mentor to help in related questions.

According to Eurostat (Digital Economy & Society in the EU: 2017 edition), 50% of the European Union workforce had access to Internet and used the computer in 2016. 69 % of businesses provided a portable device with a mobile Internet connection to their employees. The Nordic countries are the most advanced in this regard- Finland (94 %), Denmark (92 %) and Sweden (85 %). 86% of organisations justified the need for ICT to access work e-mails, while other reasons included working on business documents (50 %) or using business software applications (44 %). Considering this European statistical background, it is not surprising that all interviewed managers said that organisations should provide virtual/distance workers the necessary ICT (laptops, tablets.). On the other hand, no information was gathered regarding home office or other work locations, thus the ergonomic aspect of work was solely the workers' own responsibility.

Although newly recruited staff was expected to be ICT-literate and preferably showed a high level of ICT skills, managers generally preferred to hire skilled people instead of training them. Most likely, this type of reluctance is explained by the relatively high proportion of skilled workforce available - 3.7 % (8.2 million people) of the total number of people employed in 2016 in European Union was ICT specialists; the highest number of ICT specialists in total employment was registered in Finland (6.6 %), Sweden (6.3 %) and Estonia (5.3 %) (Digital Economy & Society in the EU: 2017 edition). The younger generation in the workforce tends to have a higher level of ICT skills, but they do not feature proportionally in the workforce. Hence, training provided by organizations is very much needed. Even if the level of ICT skills in society is raised, it does not automatically mean the workers possess ICT-mediated communication skills and virtual workforce management skills. These still need to be developed by organisations, making the role of the human resource departments even more crucial than ever. As only 22 % of European Union companies reported having provided training to develop or upgrade ICT skills of their personnel (Digital Economy & Society in the EU: 2017 edition), it is of the utmost importance that managers in Estonia as well as other European countries start paying more attention to skills needed by the 21st century workforce and start providing the necessary training.

Most of the managers did not fully acknowledge the fact that working virtually or that virtual work requires changes in management techniques. Managers who were interviewed preferred transformational management styles over transactional styles. In addition, virtual managers preferred intellectual stimulation, inspirational motivation and individual consideration. Management by objectives as the main management philosophy was, in most cases, not practised. Communication rules

(taking into account ICT-mediated communication specifics) were usually not set and agreed between virtual managers and virtual workers. As transformational and more emergent/shared leadership is considered more suitable for newly formed, loosely tied and emergent virtual teams (Gibbs, Sivunen & Boyraz, 2017), this is most likely not the ideal leadership style by virtual workers in the interviewed organisations – most of the virtual work appeared to happen in existing teams/ departments by employees of longer work tenure. This at least partially explains virtual workers' relatively lower general work satisfaction and satisfaction with the direct manager compared to face-to-face working employees (Mihhailova 2009; Mihhailova, Õun & Türk 2011).

As a rule, there was no formal training offered regarding virtual/distance work-related hazards or initiated discussion of communication rules suitable for virtual work (Table 3). This applies to virtual workers and virtual managers – none of them had participated in any virtual work related trainings. In most organisations, some types of internal written formal rules exist, that also included communication rules, but these were usually purely formal and not introduced (to new staff members) or discussed/used by workers of longer tenure. Informal ICT-related communication rules have been developed by workers and passed on to new recruits as part of the organisation culture during daily work assignments. As explained by one of the managers interviewed:

"We have no formal communication rules, but we have all set similar automatic signatures to our official e-mails. But in case of replying from mobile phone they somehow get lost…"

Table 3: Virtual Workers' Specifics Described by Virtual Managers (n=36)

Questionnaire item and topic	Main results
2.1 Characteristics of virtual workers	Younger (in their 30's) people are eager to adopt new ICTs
	Usually higher educated
	Administrative positions, specialists
2.2 Competences of virtual workers	Trustworthiness, independence, self-assurance, self-discipline, emotional intelligence, constructiveness,
	ICT savvy, does not depend on IT support all the time
	Skills: time management, communication, analytical,
	Comprehension of whole process, strategic big picture thinking
2.3 Competence development of virtual workers	No formal system
	IT specialist as support staff, if needed
	Communication systems are introduced to new recruits and assigned a mentor in some cases
2.4; 2.5 Type of contract and recruitment	Termless contract
	Virtual work specific competences not assessed

The general belief among virtual managers appeared to be that it was not necessary to take action if workers somehow handled the missing rules of conduct situation on their own. Clear exceptions here were law enforcement, medical and social work related institutions (public/governmental service organisations in general) where strict rules of handling documents and personal information of clients were followed and highly regulated by several related laws. This also raised a specific type of challenge in adopting more distance work – rules were set where documents were never allowed to be taken out of the office and different ICT systems' safety issues needed to be solved.

Although both virtual managers (see Table 4) and virtual workers have had no formal training in virtual work or virtual management, all of them considered trust in the virtual workers' ability to accomplish tasks an important factor in becoming a successful virtual manager. In addition, managers considered the important competencies for virtual managers to include: personal conviction/persistence, cognitive abilities and creativity, enthusiasm alongside personality traits of conscientiousness and openness. It was stressed by several managers that conscientiousness was also something they valued in their virtual workers. That corresponds well with trust being an important issue in all virtual relationships as outlined in the theoretical literature (Handy, 1995; Hildreth *et al.,* 2000; Aubert & Kelsey, 2003).

Table 4: Virtual Managers' Specifics Described by Virtual Managers (n=36)

Questionnaire item and topic	Main results
3.1 Competences of virtual managers	Trustful, not "control freak"; optimistic.
	Skills: planning, communication; ICT management, analysis, leadership
	Knowledge of field of activity is considered more important than virtual work related skills
	No formal development of virtual work management skills
3.4 Communication channels	1. E-mail 2. Phone/skype 3. Organisational intranet/platform
	Face-to-face communication needs to remain, mostly important in the beginning and end of project, for conflict management and for positive feedback to be effective/personal.
	Face-to-face preferred over ICT if possible
3.5 Communication rules	Formal communication rules usually not set (exception: police organisation).
	Informal communication rules more common than formal ones
	Informal rules set ad hoc and develop as part of organisational culture
3.7; 3.8 Management philosophy and work assessment	Management by objectives usually not used (only in sales departments/ organisations).
	Work results assessment not systematic
	Focus tends to be more on process than results
	Work processes are monitored mainly using internal information systems/platforms
	Feedback from clients is important

Surprisingly, managers acknowledged the value of personal conviction/persistence in the virtual context, but gave it among the lowest score in their own self-assessment of the same competence list. Even more interesting is that tolerance for uncertainty was assessed the lowest, although in the virtual context, most of the time managers needed to handle the uncertainty of workers measuring up to the task.

Planning well in advance along with ICT-related skills (see Table 5) was considered important because in the virtual environment, communication takes a longer time and in order to meet deadlines, enough time is needed to be left for solving conflicts as well as potential miscommunication. Misinterpretation of e-mails (the most used type of communication channel by all managers) and other miscommunication via ICT-mediated communication were well known and virtual managers have developed their own techniques to avoid these types of problems. The following are examples given by virtual managers:

"I have developed a habit, in case of important tasks, that I send an e-mail and then go and talk to the person, if possible. Just to make sure that he understands which assignment is important and does not spend too much time on unimportant one. It has happened that I reach the person before e-mail…"

"We have one rule set for videoconferences – all of the people online (6 regions) need to be seen on the screen by others. No sitting in the corner or blind spot of the camera allowed!"

Table 5: Virtual Work Challenges Described by Virtual Managers (n=36)

Questionnaire item and topic	Main results
4.1; 3.6 Virtual work related problems	Conciseness of written formal communication leads to misinterpretation and conflicts
	Virtual communication requires longer explanations - more time needed for communicating
	Misinterpretations of important and unimportant tasks
	Conflict management via ICT impossible/ineffective
	Managers are more tied to pc - workers expect more informal face-to-face communication
4.2 Gains of using virtual work	Formally not presented as part of motivational package, but time/place flexibility is valued by workers
	ICTs used are usually written - possibility to resend and check information again
	Cost savings easy to prove (e.g. avoided transportation)
	Revenues increase potentially possible, but hard to prove

Social media has made a big impact in the 21st century and is also used as a means of communication with clients and staff. Interestingly, only a few virtual managers interviewed reported the use of Facebook or other well known social media platforms for communicating with virtual workers. In fact, in law enforcement it is considered a forbidden channel (information safety considerations) and in the media industry it is strictly forbidden to share original media content produced by the organisations (e.g. photos, videos, etc.).

Work results were important for managers, but most of the attention was still concentrated on work process monitoring rather than end results. Formal assessment interviews with virtual workers were not used as virtual managers did not find them important – in most cases some type of the organisation's internal IT platform was used to monitor work progress. Management by objectives as management philosophy was not used in any of the organisations involved in the study (a few have tried, but stopped as too much time and effort was consumed in order to streamline all goals starting from the top level management). Face-to-face meetings were preferred if possible over the use of ICT as virtual managers received

feedback from workers needing more face time in order to build relationships and explain work-related issues. In conclusion, virtual work as well as distance work were seen as value-adding possibilities, not a replacement for face-to-face work.

CONCLUSIONS AND RECOMMENDATIONS

Virtual work is adopted in the Estonian service sector, but related terminology and practices are still rather unknown and just starting to gain wider attention. The main reason why managers are unaware of virtual work-related specific management topics appears to be the gradual introduction of ICTs into work practices over the decades. Thus, awareness of change needed in managerial practices has not been instantly obvious (as it would have been in the case of a deliberate change project). Over time, employees' awareness of flexible work arrangements has grown leading to the growth in demand for time and locational flexibility offered by organisations. It can be concluded that at least in the Estonian service sector example – the adoption of virtual work and distance work practices has been initiated mainly by employees, not managers (organisations). Considering global trends in ICT development, it can be expected that virtual work could become the prevailing work practice than is currently observed. This raises the question of the responsibility different interest groups need to assume in responding to and leading this type of change in society and organisations.

Organisations and managers particularly need to rapidly become aware of changes needed in management techniques, the use of ICT, ICT-mediated communication and training needs of subordinates as well as managers themselves. This highlights the central role of the human resources managers and especially training specialists in this process. In general, it is difficult for one to become aware of one's shortcomings. As a result, external help might be needed in order to initiate large scale changes in organisations. Thus, virtual work management training offered firstly to human resources managers by HRM associations and universities could be helpful. This also places a significant responsibility on universities that need to develop their curriculum accordingly. Co-operation between universities, HRM associations and telework/virtual work-promoting associations can play a central role in influencing a significant proportion of the organisations.
If flexible work arrangements are publicly discussed and best practice cases (on national and international level) are introduced and set as an example, general awareness of flexible work arrangements will grow.
This will lead to more managers accepting virtual and distance work as part of their routine work processes. Consequently, virtual work options could be made available to most employees, not just a selected few or those holding managerial positions, as current results showed. It is not the sole responsibility of an institution or interest group to initiate broad-scale changes in the adoption of new work forms, rather it requires joint efforts among cooperating parties.

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Appendix A: Virtual Work and Its Management Related Topics

	Topics	Contributing authors	Interview questionnaire items
1. Virtual work initiation and work specifics	Job groups and virtual work specifics	Watson-Manheim, Chudoba & Crowston, 2002; Piccoli, Powell & Ives, 2004; Peters, Dulk & Ruijter 2010; Gibbs, Sivunen & Boyraz, 2017.	Job groups working virtually; Describe work routines and virtual work situation in Your organisation
	Work location	Pyöriä, 2009; Morganson, Major, Oborn, Verive & Heelan, 2010; Mayo, Gomez-Mejia, Firfray, Berrone & Villena, 2016; Fan Ng, 2016; Petrulaitiene, Rytkönen, Nenonen & Jylhä, 2017.	Describe work locations of virtual workers; Use of telecentres
	Virtual work adoption	Wicks, 2002; Pérez Pérez, Sánchez, Carnicer & Jiménez, 2004; Kowalski & Swanson, 2005; Peters, Dulk & Ruijter, 2010.	How virtual work was adopted - describe the process; Who initiated virtual working; Why was virtual work adopted
	Types of work assignments/areas of work	Bentley & Yoong, 2000; Beasley, Lomo-David & Seubert, 2001; Piccoli, Powell & Ives, 2004; Holtbrügge, Schillo, Rogers & Friedmann, 2011; Olson & Olson, 2012.	For which types of work assignments virtual work - suits, does not suit (in Your organisation, in Your field of activity)
2. Virtual workers' specifics	Characteristics of virtual workers	Bentley & Yoong, 2000; Beasley, Lomo-David & Seubert, 2001; Pyöriä, 2009; Suh & Lee, 2017.	Social and demographic characteristics of virtual workers (sex, age, job group, work tenure, ...)
	Competences of virtual workers	Kowalski & Swanson, 2005; Suh & Lee, 2017.	Describe skills needed for becoming a successful virtual worker; Name 5 most important competences of virtual workers
	Competence development of virtual workers	Holtbrügge, Schillo, Rogers & Friedmann, 2011; Mukherjee, Lahiri, Mukherjee & Billing, 2012; Liao, 2017.	How virtual competences are developed; Development methods used; How skills are assessed during recruitment
	Type of contract and recruitment	Makinen, Hurmelinna-Laukkanen & Hassan, 2008; Plump & Ketchen, 2013; Roehling, 2017.	What types of contracts are used; Has virtual working been in any way the reason behind contract termination

Appendix A continued

	Topics	Contributing authors	Interview questionnaire items
3. Virtual managers' specifics	Competences of virtual managers	Sosik, Avolio, Kahai & Jung, 1998; Hoyt & Blascovich, 2003; Horwitz, Bravington & Silvis, 2006; Pyöriä, 2011; Mukherjee, Lahiri, Mukherjee & Billing, 2012; Ziek & Smulowitz 2014; Paoli & Ropo, 2015; Mayo, Gomez-Mejia, Firfiray, Berrone & Villena, 2016; Gibbs, Sivunen & Boyraz, 2017.	Describe skills needed for becoming a successful virtual manager; Name 5 most important competences of virtual managers; Rate the importance of 14 following managerial competences in virtual context compared to face-to-face context; Using previous competences list - rate the level of your own competence (on 5-point Likert scale); Big 5 personality traits - comment each one's importance in virtual management context
	ICT-mediated communication; types of ICT	Paulee & Yoong, 2001; Jacobs, 2004; Daft & Lengel, 1986; Daft, 1999; Ferry, Kydd & Sawyer, 2001; Kirkman & Mathieu, 2005; Gressgård, 2011; Gibson, Huang, Kirkman, & Shapiro, 2014; Brotheridge, Neufeld & Dyck, 2015; Adam, Effah & Boateng, 2017; Schaubroeck & Yu, 2017.	Describe communication patterns with virtual workers - frequency, channels used etc.; rate frequency of using given list of communication channels; how often and why face-to-face communication is used
	Communicaton rules	Akkirman & Harris, 2005; Kowalski & Swanson, 2005; Olson & Olson, 2012; Brotheridge, Neufeld & Dyck, 2015.	Are communication rules set and how formally/informal is their nature; Are rules oral/written; When and how are the rules agreed or introduced to virtual workers
	Management philosophy and work assessment	Hater & Bass 1985; Sosik, Avolio, Kahai & Jung, 1998; Bell & Kozlowski, 2002; Kelloway, Barling, Kelley, Comtols & Gatlen, 2003; Horwitz, Bravington & Silvis, 2006; Peters, Dulk & Ruijter 2010; Mayo, Gomez-Mejia, Firfiray, Berrone & Villena, 2016.	What is the main difference between face-to-face and virtual work from the managerial perspective; Comment following aspects in virtual management context - planning, organizing, leadership, human resources management, communication, control, decision making, leadership style; comment following 7 leadership styles usage in virtual context; is management by objectives used as the main management philosophy
4. Gains and challenges of virtual work	Gains of using virtual work	Morgan, 2004; Kowalski & Swanson, 2005; Maruyama & Tietze, 2012; Zuofa & Ochieng, 2017.	How has the organisation benefited from using virtual work; comment following aspects - revenue, costs, employees' work satisfaction, productivity
	Virtual work related problems	Morgan, 2004; Kowalski & Swanson, 2005; Pyöriä, 2011; Maruyama & Tietze, 2012; Zuofa & Ochieng, 2017; Han, Chae, Macko, Park & Beyerlein, 2017; Suh & Lee, 2017.	Which problems have been encountered while using virtual work; please comment frequency of facing the following 8 problems in your virtual management work