Virtual teams – just a theoretical concept or a widely used practice?

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ABSTRACT

Virtual teams and management processes in them have been researched mainly theoretically. Most of these papers concentrate on presenting the definition and/or on outlining the advantages/disadvantages of virtual teams. Use of virtual teamwork is still relatively new field for academic research and even when researched empirically usually case study, interviewing or some other small sample approach is used. Current paper tries to test on a bigger sample of data, based on a questionnaire type of research, is the use of virtual teams really growing as usually stated in theoretical papers on this subject. As use of ICT is one of the main characteristics of virtual teams the study concentrates on issues related to ICT-mediated communication for co-operation purposes. The empirical results presented in the article are based on a sample of 226 Estonian service sector organizations.

INTRODUCTION

Background and definitions

The organizations have started to use teamwork for solving the problems and tasks mainly during the past 15 to 20 years. *A team* is a group of individuals who work interdependently for solving the problems and accomplishing tasks (Kirkman, Mathiew 2004). Relatively recent developments in the field of information- and communication technology (ICT) have enabled the organizations to start using also the so called virtual teams. Virtual teams have been defined as: "…groups of workers with unique skills, who often reside in different geographical places and who have to use for co-operation means of ICT in order to span the boundaries of time and space (Kirkman, Mathiew 2004)". Use of virtual teams is a growing trend in our modern society and most of the organizations are increasingly affected by that.

The subject of virtual teams requires further research mainly due to the fact that management of ordinary- and virtual teams are substantially different. The change is required in: understanding of the group processes, manager-subordinate communication, communication among the group members (colleagues), delegation, empowerment, achieving of synergy, main functions of management *etc*. Turning ordinary teamwork fully (or at least partially) into virtual teamwork introduces a whole new range of problems for managers.

The number of published articles and books on the subject of virtual teams (and ICT-mediated communication) has grown substantially during the past five years. Most of these publications deal with the issue of the definition of the virtual team (Bell, Kozlowski 2002; Alexander 1997; Cleaver 2000; Cohen 1997; Finholt 1997; Fitzpatrick 2000) and/or are written on outlining the similarities and differences between ordinary and virtual teams (Bell, Kozlowski 2002;Stevenson, McGrath 2004; Lipnack, Stamps 2000). Second major group of works concentrates on discussion of the strengths and weaknesses of virtual teamwork in some specific area, e.g. education: challenges related to and reasons to use e-learning (Homan, McPherson 2005; Comm, Mathaisel 2003; Evans, Ping Fan 2002). Regarding the term „virtual team" can be found many alternative options that are used to describe the same phenomena: off-site teams (Stevenson, McGrath 2004), off-site employees (Fisher, Fisher 2001), remote teams, distance work etc. At the same time it is apparent from the context or definition, that these terms are synonyms and all mean virtual teamwork.

Some of the authors go even further and expand the virtual teamwork idea from group level to organizational level by describing virtual teamwork as a new form of organization. Lipnack, Stamps (2000) and Potter *et al.* (2004) state that virtual teams are the newest forms of organizations. By Lipnack and Stamps (2000) the 21st century organizations are made up of virtual teams and networks of teams. Although the authors start with the statement about the birth of a new organizational form they still continue with the discussion, definition and analyses at the group level.

There is a variety of names used for virtual teams and virtual organizations (in many cases there is no clear distinction made between organizational and group level): „*spider web, modular, cluster, learning network, perpetual matrice, spinout, third-millennium group, boundaryless organization, postmodern organization, alternate office, extended enterprise, flexible manufacturing network, distributed global work team, turbo task*

force and autonomous work group outside existing organizational structures (Guss 1997)". By their meaning and definition all of them can and have been used for virtual teams. Below are outlined just a few definitions used to define the virtual team:

„*A virtual team is a group of people who work interdependently with a shared purpose across space, time, and organization boundaries using technology* (Lipnack, Stamps 2000)".
"*Group of geographically and/or organizationally dispersed coworkers that are assembled using a combination of telecommunications and information technologies to accomplish an organizational task* (Townsend 1998)".
„*Virtual team is a collection of task-driven members behaving as a temporary group, whose members are separated by geographic or temporal space* (Delisle, Thomas 2001)".
„*Groups of people who work closely together even though they are geographically separated and may reside in different time zones in various parts of the world*." And also "*cross-functional work-groups brought together to tackle a project for a finite period of time through a combination of technologies* (Henry, Harzler 1998)".

As it appears from this relatively small selection of virtual team definitions there are a few reoccurring words, phrases (underlined in the definitions), that are similar in meaning and are thus the core of the virtual team phenomena. These are: shared purpose/working together, use of ICT for communication, team members are separated from each other geographically, team members work in different time zones. The first of these aspects is currently not important, as it is not specific for virtual teamwork and is a general aspect of teamwork. In this article the definition of virtual team by Henry and Hartzler (1998) is used.

Different author's have different views which of those aspects to consider the most important in differentiating the virtual team from the ordinary team. Rad, Levn (2003) consider it to be the geographical distance between the team members. At the same time other authors, trying to come up with a precise and important aspects' describing definition for virtual team phenomena, have come to conclusion that not the geographical distance, but use of ICT for communication between the virtual team members is the main criteria, that distinguishes virtual teams from the ordinary ones (Kirkman, Mathiew 2004). This is a logical conclusion, because if team members, who work together in the same building, but use for communication and coordination only tools of ICT (instead of meeting eye-to-eye) is a team with a high level of virtuality and the team members of that team experience the same problems and challenges as if they would be separated by a long distance. Thus, the author agrees with the reasoning that the main criterion for distinguishing virtual teams from ordinary teams is the use of ICT for communication and cooperation between the team members.

Overview of Estonian service sector

So far the most commonly used methods for researching virtual teams are case study, interviewing and/or experiments in laboratory setting. Due to methodology constraints the results are usually based on a small sample. Nevertheless, most articles on virtual teams and distance work issues stress the growth of adopting more and more different means of ICT in everyday work processes and thus the number of virtual teams used is allegedly constantly growing. The aim of the article is to test this allegation on empirical data based on a bigger sample. The research questions raised are as follows:
1) How much are virtual teams used in Estonian service sector companies?
2) What type of organizations prefer to use virtual teamwork?
3) What are the main challenges related to virtual teamwork?
4) What are the major reasons/positive aspects why virtual teamwork is used?
5) What types of ICT and how much are used for co-operation purposes?
6) How has use of ICT and virtual teamwork affected employees' compensation systems?
The sample consists of 226 companies and 2207 respondents representing Estonian service sector. The service sector companies were chosen for studying as it is more common to use virtual work in case of services than production. Virtual work is more likely to be used in service sector companies, where mostly the intellectual and knowledge intensive type of work is done, as it is much more difficult to use virtual teams in manufacturing – people need to be present for accomplishing the work assignment all the time & usually at the same location.

Development of Estonian service sector has been affected by several changes in its economic environment – some of the changes are of general nature (present in all Europe), but some are specific for transition countries. The two general changes affecting all European service sector companies are: firstly – development of ICT has changed the way services are offered and their characteristics. And secondly – socio-economic changes have lead to increased demand for personal services, because government has decreased supply of many services, there are now two people earning income (instead of one person) in many households and the number of elderly people in population has grown. In addition to these changes Estonian service sector's rapid growth stems from the fact that this sector was underdeveloped during Soviet time and also a rather quick collapse of agricultural-

and industrial sector during the political reforms period. Due to these reasons there was a big amount of workforce available for starting the business in the service sector. Firstly there was growth in the service sector due to increase in commercial, tourism and finance services. During the more recent years the development of the sector is more affected by growth in business services and ICT related services sub-sectors (Lumiste, Lumiste 2003). Based on preliminary results the Estonian economic growth in the 4th quarter of 2006 was 11,2%. The growth was mainly due to increase in manufacturing and commerce, but also transportation, communication and financial services (Majandus kasvas … 2007). As use of ICT has influenced many companies in service sector, there is obvious need to further research how use of virtual teams could be better implemented and what are the challenges related to that, in order to maintain the development of the sector.

RESULTS AND DISCUSSION

Sample and data collecting

The questionnaire based research was conducted from February to June 2006. The questionnaire was developed by author as part of a virtual teams' typology model development process. The reason for using questionnaire type of research was, because there is usually indicated in literature, that use of virtual teams is increasing, but there is no empirical survey to back this allegation up. Thus, this type of survey enables to reach to many people and makes it possible to test this argument based on a bigger sample (compared to interviewing or case study approach) and to make more meaningful conclusions. The sample was random – the questionnaire was distributed to as many service sector companies (including public sector) as possible. In all the cases firstly the companies were contacted to get the acceptance of the management and then the questionnaires were distributed to personnel. The questionnaires were distributed and collected by the help of students studying Strategic Management at University of Tartu, Pärnu College, as a part of their course project. The questionnaires were returned directly to the students participating in the research in a few weeks or in some cases right after receiving and filling in.

Category	Number	Category		Percentage
Organizations	226	Education	Higher education	44,7
Total No. of respondents	2207		Vocational school	30,4
Average age (years)	35,3		Secondary school	22,2
Average work tenure (years)	6,3		Basic school	1,6
Male respondents	687	Male respondents		31
Female respondents	1510	Female respondents		69

Table 1. Sample characteristics.

No e-mailing or postal services were used for distributing or returning the questionnaires in order to maximize the number of returned questionnaires. The direct contacting and personal approach worked well as one of the aims was to gather min 10 questionnaires per company and it was achieved. For analyzing the data statistical program SPSS was used. The questionnaires were collected from 226 different service sector companies and the total number of returned questionnaires is 2207. As it appears (see Table 1) from average years of work and age the sample is currently made up of relatively young and inexperienced people, almost half of them having university degree and ~70% of them are female. At least based on this sample, it seams that women are more willing to spend time on filling questionnaires than men.

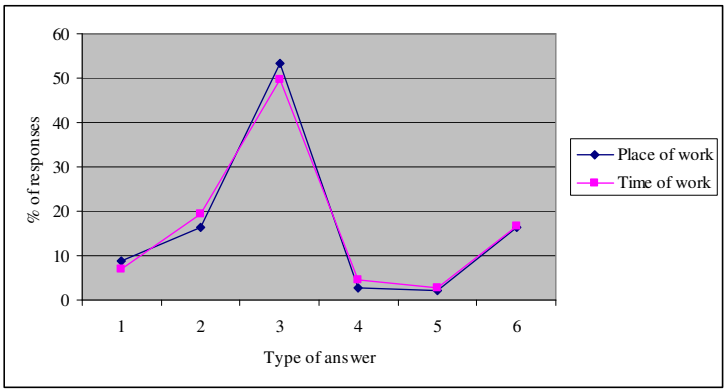
General results

The sample is based on respondents working in 12 different types of service organizations (Table 2). Although questionnaires were returned also from some production companies these are currently not included, but in further research it would be interesting for example to compare service sector companies' usage of ICT to the same of production companies. Most of the respondents are working for sales/marketing, accommodation//food and governmental institutions. The Sales/Marketing category includes whole- and bulk sale companies. By type of position the biggest subgroup represented is specialists. Occupation wise most of the respondents (32%) are working in tourism and accommodation or sales (16,8%) related positions, which is logical based on the field of activity of the biggest number of companies in the sample. Proportionally a lot of the respondents are on managerial positions, which is unexpected as the average age of the sample is quite young. On the other hand Estonian companies are relatively small and young educated people get relatively easily promoted.

		Frequency of going to workplace for work						Total
		7 days a week	4-5 days a week	2-3 days a week	Depends on the week	Infrequently/ usually work at home	Never	
Organization's filed of activity	Sales/Marketing	15	354	26	79	5	9	488
	Finance/Banking/ Insurance	1	99	4	10			114
	Real estate/Construction	5	64	2		2		73
	Lending		10	1				11
	Governmental institutions	24	390	16	24	4		458
	Education / Training	2	77	9	4	1		93
	Hotels/Accommo-dation/Food	19	282	60	82	2		445
	Entertainment	2	15	13	14			44
	Sports / Beauty services	1	17	5	6	2		31
	Media	1	105	8	8	6		128
	Postal/Phone services	14	197	13	9	5	2	240
	Energy	3	62	1	4			70
Position	Manager	23	302	8	20	3	2	358
	Specialist	36	868	61	70	18	9	1062
	Worker	23	407	77	137	5		649
Income	Time based	83	1609	143	223	20	7	2085
	Amount based	6	57	11	20	5	1	100
	Results based	13	290	17	50	8	8	386

Table 2. Frequency of going to workplace for work by organization's field of activity, employee's type of position and income (number of responses).

Respondents were asked how often they go for workplace to work, having option to choose between answers ranging from "7 days a week" up to "Never" (see Table 2). The most usual way of work in Estonian service sector companies is still the option of going to work 5 times a week in total of 40 hours (75,8% of responses). The next most common option of response is that "it depends on the week" (10,9%), although in some cases it may also indicate use of virtual teamwork, but in most of the cases it is probably more a sign of shift work (e.g. sales person in a gas station works 3 times a week 10 or even 12 hours shifts). The smallest percentage of respondents either never go to workplace or go there infrequently based on need (e.g. meeting, client visit) – all together these responses make up only 1,7% of all the answers. In case of sales and telecommunication activities the reason for answers indicating that people never go to workplace is probably due to the work specifics: e.g. constant client visits & travelling (salesmen), it is possible to use company sponsored phone and consult clients from home (IT consultants). Media companies (13) were mainly newspaper and journal publishers and respondents in this category (freelance) journalists mostly working from home. It appears that sales, media and telecommunication services companies are the most willing ones to adopt modern types of work. In case of compensation system respondents could choose all the options that apply in their case, thus total number of responses is bigger than 2207. In case of virtual teamwork adoption the shift should have been from time and amount based of compensation systems towards results based appraisal, because the virtual work is done more in remote locations (hard to measure time spent on work) and usually of intellectual nature (hard to measure quantity). Currently no such kind of shift can be observed, which is logical as virtual teamwork is rarely used. Based on work location analyses – virtual teams are still either relatively little used concept in Estonian service sector organizations or the location is not the most important aspect for analyzing use of virtual teams as proposed by theorists. The use of different means of ICT should share some light into this issue too.



Types of answers: 1 - Yes, even without consulting the manager; 2 - yes, after consulting the manager; 3 - No; 4 - Rarely; 5 - Always; 6 - Sometimes, it depends on the type of assignment.

Graph 1. Possibility to choose the work location & time by employee (%).

Most commonly people are never allowed to choose the work location and time by themselves (Graph 1). Surprisingly the graph of the results was exactly the same for time and place. The only exception were top managers/owners who can choose the time and location of work on their own, but for other types of occupations it is still commonly not allowed even if it is expected by the employees .On the other hand - based on the type of work assignment people are allowed or even expected to change the work location (e.g. work mission to other country). Although in most cases people work at the official work location all the time or mostly (if asked how often they go to work, Table 2), the answers to the question if work assignment enables or manager allows to work at other locations (e.g. home) revealed, that 107 respondents said that sometimes they also work at home or other locations and 259 respondents said that due to work assignments say travel a lot. Thus in general 4,8% work at least sometimes at home. This is a few percentages more than could be seen from the table 2; probably because some of the answers were included under answer "it depends on the week" and the initial 1,7% was calculated based on answers "Never" or "Infrequently". The reasons why people choose to work in locations other than the official every day work place are:

- Convenience of not leaving home, preparation for work (44 responses);
- Work overload, did not manage during official work hours (36 responses);
- Possibility to concentrate on work in a peaceful setting (20 responses);
- Cost saving (e.g. transportation cost) (2 responses).

The preparation for work advantage was stressed by teaching/training field of people; managerial and administrative position people stressed more the option of possibility to concentrate in a peaceful setting. There were no differences in responses between men and women and among different types of occupations as the most common reason why people choose to work sometimes at home is the work overload.

		Type of communication channel							
	Statistics	Formal written communi-cation	Informal written communi-cation	Forum	E-mail	MSN	Phone / Tele-conference	Video conference	Meeting eye-to-eye
Preference	Valid No.	1693	1643	1260	1744	1330	1869	1230	1875
	Missing	514	564	947	463	877	338	977	332
	Mean	4,12	4,67	6,28	2,81	5,54	2,28	6,98	2,22
	Mode	4	5	6	3	7	2	8	1
	Std. Deviation	1,71	1,34	1,43	1,40	1,84	1,16	1,63	1,55
Satisfaction (max = 6)	Valid No.	1759	1708	1205	1805	1296	1951	1094	1979
	Missing	448	499	1002	402	911	256	1113	228
	Mean	3,98	3,80	2,74	4,86	3,79	5,14	2,51	5,56
	Mode	4	4	3	6	6	6	0	6
	Std. Deviation	1,44	1,41	1,77	1,21	1,92	1,05	1,92	5,53

Table 3. Preference of communication channels and satisfaction with them.

Respondents were asked to rank eight communication channels from the most important and used one no.1 to the least used/unimportant no.8 (see Table 3); based on their work practice of using them communicating with colleagues. As expected the most important and widely used option is meeting eye-to-eye (mode 1, 1875 responses); this option was also rated providing highest level of satisfaction with communication (mean 5,56 on 6-point scale). The second and third are phone (mean 2,28) and e-mail (mean 2,81), which are probably also the most commonly used tools for work after meeting eye-to-eye. This can be assumed also by the lowest numbers of missing values as respondents most likely chose not to answer the satisfaction level with the tools they do not use. Thus it seams that satisfaction is higher with the means that people are using more and these are actually richer means of communication as expected. MSN, Forums and videoconferencing are substantially less used options for communicating and this result is in line with the previous findings that virtual teams are still relatively unused option for cooperation and this is also obvious based on the results of usage of different means of ICT.

ICT-mediated communication has its limitations and challenges compared to meeting eye-to-eye. Respondents were asked if they have encountered in their work the usual problems outlined in literature related to ICT-mediated communication and how they feel about them on a 7-point scale (0-it does not bother me at all; 6 – it bothers me a lot). The most unpleasant appear to be slow feedback (mean 3,36) and feeling isolated (mean 3,95) when used for a longer period of time. Less unpleasant, but still not favorable aspects are: ICT-mediated communication is more time consuming (mean 2,55), less emotional (mean 2,5), usually lacks visual contact (2,46) as well as audio contact (mean 2,35). Based on these results it is logical that people prefer to use eye-to-eye meetings and the slow feedback in addition to the other negative aspects of ICT-mediated communication were (based on open end questions):

- Technical problems (sending and receiving of message) (621 responses);
- (N)etiquette (118 responses).
- Misinterpreting of the message (70 responses);
- Knowledge about software/hardware (51 responses);
- Lack of means of ICT or inconveniently placed (32 responses).

Most of the problems are of technical nature and usually solvable by IT specialist, but they slow down and the work and annoy people. This category of problems includes also spam and viruses related inconveniences. Another common problem is that people either do not receive the message (e.g. e-mail, fax) or they choose to ignore it and/or delay the answer (118 responses). Even if the soft- and hardware is present people need to be taught first how to use them and in some cases was said that even if "*I can use and work with it, my colleagues don't and that annoys me most"*.

Respondents were asked to write what are the biggest advantages of using ICT in their work. Based on 303 responses there appeared to be answers in 4 categories. Most commonly was praised the speed (855 responses) and opportunity to react quickly in time of crises, but also this category includes responses like "*I do not need to leave my desk/home for getting things done – it would take time, but now I can do it at once*!" (basically it is convenience). The second most valued aspect is location related (169 responses). Responses reflected the possibility to approach people and find information without leaving the place of work or gave them possibility to work at home. Also were mentioned the possibility to save and analyze information and multitasking/sharing information instantly with many people. The third most popular type of answers was finances related (123 responses) – time and money not spent on transportation *etc*. And in a few instances also the natural environment protection was mentioned (15 responses). Thus, time (time of work) appears to be a little bit more valued aspect then space (place of work).

Negative aspects of work	**No. of respondents**	**Positive aspects of work**	**No. of respondents**
Work processes	190	Rules/Stability	397
Work time	148	Colleagues/ Relations at work	315
Work overload/stress	113	Work itself	300
Work environment/facilities	94	Freedom	282
Colleagues/Relations at work	51	Communicating	137
Salary	34		
Powerlessness/Unknown future	27		

Table 4. Negative and positive aspects of work.

The most positive aspects of work for respondents seams to be the stability of organization. It is probably valued due to constant changes and reforms in economy and people are happy if they find some stability in their lives. Although opportunity to choose work time and place were not the most commonly suggested ways of increasing general work satisfaction, it could be something to think about for the managers as the most negative aspects are related to management of work processes and time. "Work processes" is a general category which includes responses like "*too much bureaucracy*" and "*although our offices are next to each other people from different departments are not aware of each others work*". Possibility to choose work place and time could be at least partially a solution for work overload (less time spent on commuting) and work environment (home-office). It would definitely help to improve the problem of inappropriate work time, but probably not for all occupations as due to work specifics it is impossible to let every employee to choose the suitable work time. Unexpectedly few people complained about low salary. Although many negative aspects were brought to light, in general people rated their overall work satisfaction quit high: mean 4,64 (max 6). Satisfaction with available means of ICT is even higher (mean 4,68) than satisfaction with possibility to choose work time (mean 4,4) and place (mean 4,47). When asked what should be done to increase the overall work satisfaction the open-end questions were answered as follows: improved work environment (offices, equipment etc.) – 308 responses, opportunity to choose work time – 156 responses, salary – 120 responses, opportunity to choose work place – 99 responses, improved work processes - 93 responses. Thus in general people are rather satisfied with the currently usable means of ICT and the fact that there is usually no opportunity to choose the work time and place. On the other hand the managers should pay closer attention to the possibility to offer people more flexible work hours, as this can be very important aspect for some people (7 % of 2207 respondents) as seen from the result of this study.

Limitations and future research

There is more than 35 000 registered companies (Estonian Ministry of Economic Affairs … 2007) that are providing different kind of services in Estonia. Although the aim of the study is to gather information from as many Estonian service sector companies as possible the current results are based on 226 companies. Thus it is obvious that currently some of the service sector branches are not or under represented in the study as well as the number of companies could be bigger. However the results offer some insight into the subject of virtual teamwork as this sample is much bigger than usually used in similar studies. These results are intended as the first overview of a longer study, thus the article can be consider as overview of work in progress. The sample of 226 organizations with 2207 respondents indicates that each organization is represented by approximately 10 people, thus it also one of the concerns when interpreting the data as well as something to work on in the future research.

CONCLUSIONS

The virtual team term is being used very frequently, but its definition varies relatively lot. The most common assumption appears to be that virtual teamwork requires use of ICT and that there is a big distance between the virtual team members. It is concluded in the article that the use of ICT for communication is the most important characteristic for describing a virtual team.

Based on current data less than 5% of people employed in Estonian service sector companies are involved in virtual teamwork or are offered flexible work conditions (have possibility to choose work time & location by themselves). This is unexpected finding as in many theoretical and empirical articles (although based on a much smaller sample) it is usually stressed that due to increased use of different means of ICT the number of virtual teams, flexible working arrangements etc. is high and/or increasing. Although, it is impossible to say based on data if there has been increase in numbers, it can only be assumed that 5-10 years ago the percentage was even closer to zero.

Different means of ICT are used for cooperation purposes with colleagues, but the preference is still given to meeting eye-to-eye as this appears to lead to the highest level of satisfaction with communication. Closely followed by use of e-mail and phone, which are the second and the third in the list of preference. Although people are rarely allowed to choose the place and time of work themselves the option of choosing suitable time is valued more than the aspect of place. This can be a valuable knowledge for managers interested in increasing employees' work motivation and satisfaction.

In conclusion, it can be said that virtual teams are still very little used concept in Estonian service sector companies and if used then more by sales, media and telecommunication organizations and apparently by knowledge workers. Based on relatively high level of overall work satisfaction as well as satisfaction with limited opportunity to choose work location and time, it can be predicted that the use of virtual teams and adoption of flexible work arrangements is increasing slower than could be and has been expected by different authors.

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