Effects of Virtual Meetings on Individuals and Organisations in Swedish Public Authorities: Survey results from Swedish Energy Agency, Swedish Environmental Protection Agency and Swedish Transport Administration

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Survey results from Swedish Energy Agency, Swedish Environmental Protection Agency and Swedish Transport Administration

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Abbreviations

AG – age

CMC - computer mediated communication

CR – career and recruiting

DA – discipline and attention

EBIDTA - Earnings before interests, depreciation, taxes and amortisation

F2FM – face-to-face meeting

GE – gender and social equity

ICTs - information and communication technologies

IIIEE – International Institute for Industrial Environmental Economics

LP – potential to learn

LU – Lund University

MS – meaning and significance

NS - negative stress

PIS – personal safety and information security

PPQ – performance, productivity and quality

SEA – Swedish Energy Agency

SEPA- Swedish Environment Protection Agency

SI – social interaction

STA –Swedish Travel Administration

VM – virtual meeting

WL – work/leisure time and life quality

1 Introduction

This work report presents results of the ongoing research project *Implications and Reporting of Virtual Meetings (*in Swedish *Mäta resfria möten)*[1], which has been performed at the International Institute of Industrial Environmental Economics (IIIEE) at Lund University since June 2011. The goals of the project are to develop a methodology to: 1) assess impacts from virtual meetings (VMs) in Swedish public authorities, and 2) perform an impact analysis based on the developed evaluation parameters and indicators.

This work report summarises and analyses data from a survey carried out in Swedish public authorities during February-May 2013. The survey has been performed in three Swedish public authorities including Swedish Energy Agency, Swedish Transport Administration and Swedish Environmental Protection Agency. The main purpose of the survey was to evaluate effects of virtual meetings (i.e. audio-, video- and web-conferences) on studied organisations and individual employees in these organisations.

The survey was developed online with the help of Survey Methods software. It contained 34 questions, including both open-ended and multiple-choice questions, which were posed anonymously to all respondents. Question formulations are provided in Annex I (in Swedish). The survey link was sent to 1316 respondents in total either by e-mail or via Intranet, and 576 full or partial responses have been received resulting into an average response frequency of 44%.

The structure of this report is as follows. This chapter introduces the content of the report and briefly highlights key practicalities of the survey. Chapter 2 explains how survey questions have been developed, which indicators and VM effects they seek to measure, which organisations have been selected for the survey implementation and why, as well as summarises key survey performance data. Chapter 3 presents survey results breaking them into observed implications of VMs for individuals and organisations. Chapter 4 analyses and discusses survey results elaborating on the reasons why certain patterns and trends have been encountered in relation to VM effects on studied organisations and their employees. Chapter 5 concludes the report.

[1] For project description see http://www.iiiee.lu.se/fileadmin/iiiee/Photos_and_images/Projektet_Ma__ta_Resfria_Mo__ten.pdf

2 Methodology

2.1 Conceptual framework and indicator categories

The survey departs from the conceptual framework developed and refined by the research group (Arnfalk 2012), which maps all potential effects of VMs in three major areas: impacts on the society, impacts on organisations and impacts on individual employees. These areas are then broken down into a number of categories (Figure 1).

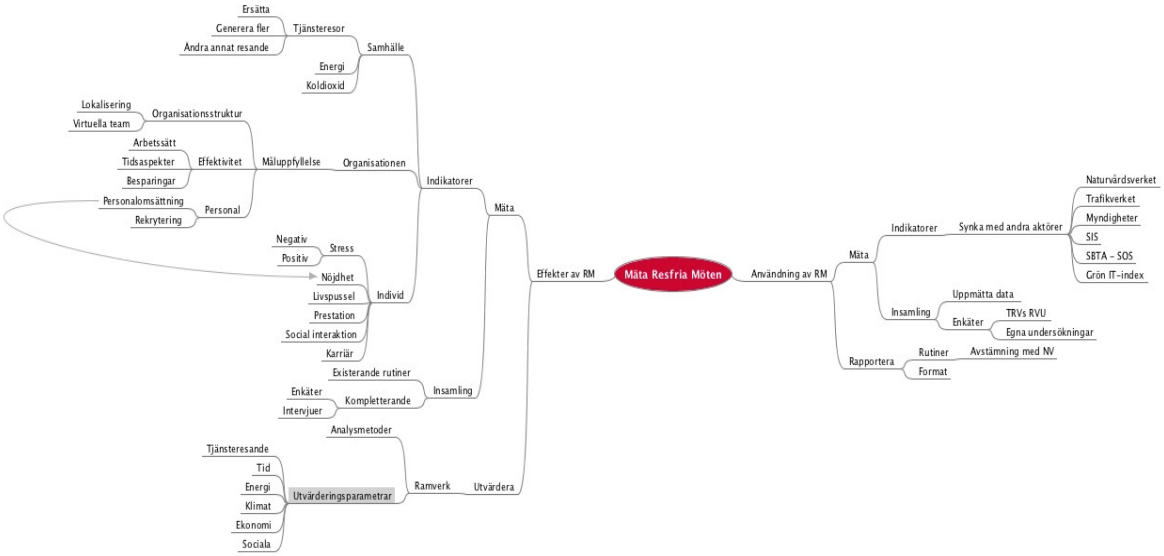

Figure 1. Potential effects from the increased VMs use on the society, organisations and individuals

Source: Arnfalk 2012

This survey has been designed to identify and evaluate potential effects of VMs on individual employees and organisations[2]. For this purpose the overarching conceptual framework has been refined in these two areas based on the research findings from a literature review, in-depth interviews with representatives from Swedish public authorities and other organisations, and expert consultations. Details on the application of the conceptual framework for the development of indicators to measure VM effects on individuals and organisations are provided in the following sub-subsections.

2.1.1 Virtual meetings and individuals

The overarching conceptual framework (Figure 1) has been refined after a thorough literature review and 10 in-depth interviews with representatives from Swedish public authorities. The refined framework includes 10 categories of potential VM effects on individuals (Figure 2):

- Work situation including negative stress (NS) and work/leisure time and life quality (WL);
- Social interaction (SI);
- Career and recruiting (CR);
- Performance, work productivity and quality (PPQ);

[2] Another subproject within this research project studies VM effects on the society. It applies different methods for indicator development and evaluation of VM effects on the society, and its results are reported elsewhere (Arnfalk 2013)

- Gender and social equity (GE);
- Personal safety and information security (PIS);
- Age (AG);
- Discipline and attention (DA);
- Potential to learn (LP);
- Meaning and significance (MS).

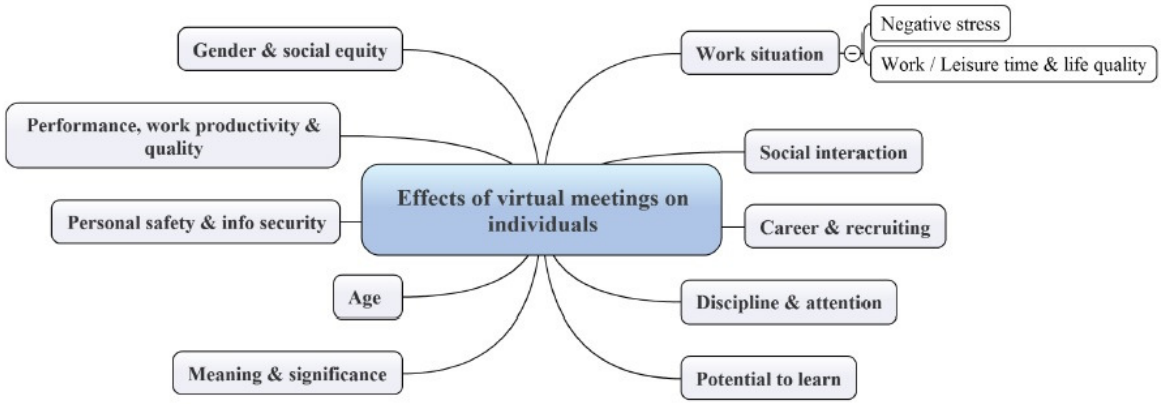

Figure 2. Potential effects from the increased VMs use at individual level

Source: Voytenko et al. 2013

Evaluation parameters (or "indicators") of potential VM effects have been developed in each category and then shortlisted for their measurement in a survey. This process is described in more detail in section 2.2.1.

2.1.2 Virtual meetings and organisations

Similar to the individual effects described above, the overarching conceptual framework can be broke down further to illustrate the expected effects on organisations. After a literature review and in-depth interviews with representatives from public and private organisations, the framework was refined to include effects grouped into four major categories (Figure 3):

- Organisational structure;
- Efficiency;
- Staff;
- Sustainability requirements.

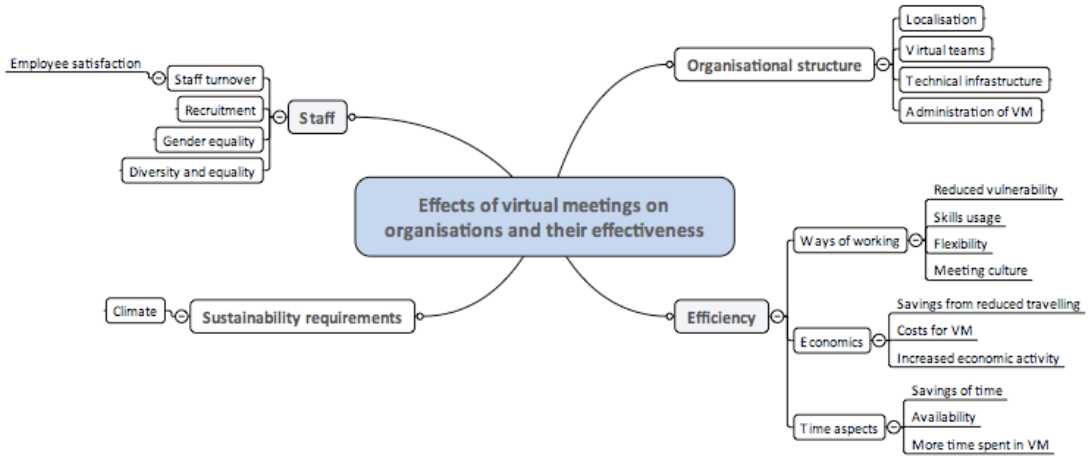

Figure 3. Potential effects from the increased VMs use at organisational level

Source: Arnfalk 2012

The indicators of organisational effects that were identified as feasible to measure in a survey fall within the categories of efficiency and staff (see section 2.1.2 for details).

2.2 Specific indicators

Considering the specificity of each area, the methodology on the development of indicators of VM effects on individuals and organisation and their selection for the measurement in a survey varied to a certain extent but followed a general pattern. First, a brutto list of indicators to measure VM effects on individuals and organisations was developed (Arnfalk 2012; Voytenko et al. 2013). After another round of expert consultations, oral and written feedback from Swedish public authorities and deeper literature studies, a netto list of indicators was proposed. These were later translated into survey questions. Further details on specific indicators of potential VM effects on individuals and organisation are provided in sub-sections 2.2.1 and 2.2.2 below.

2.2.1 Virtual meetings and individuals

In total 36 brutto indicators of potential VM effects on individual employees have been developed in 10 categories (Figure 4).

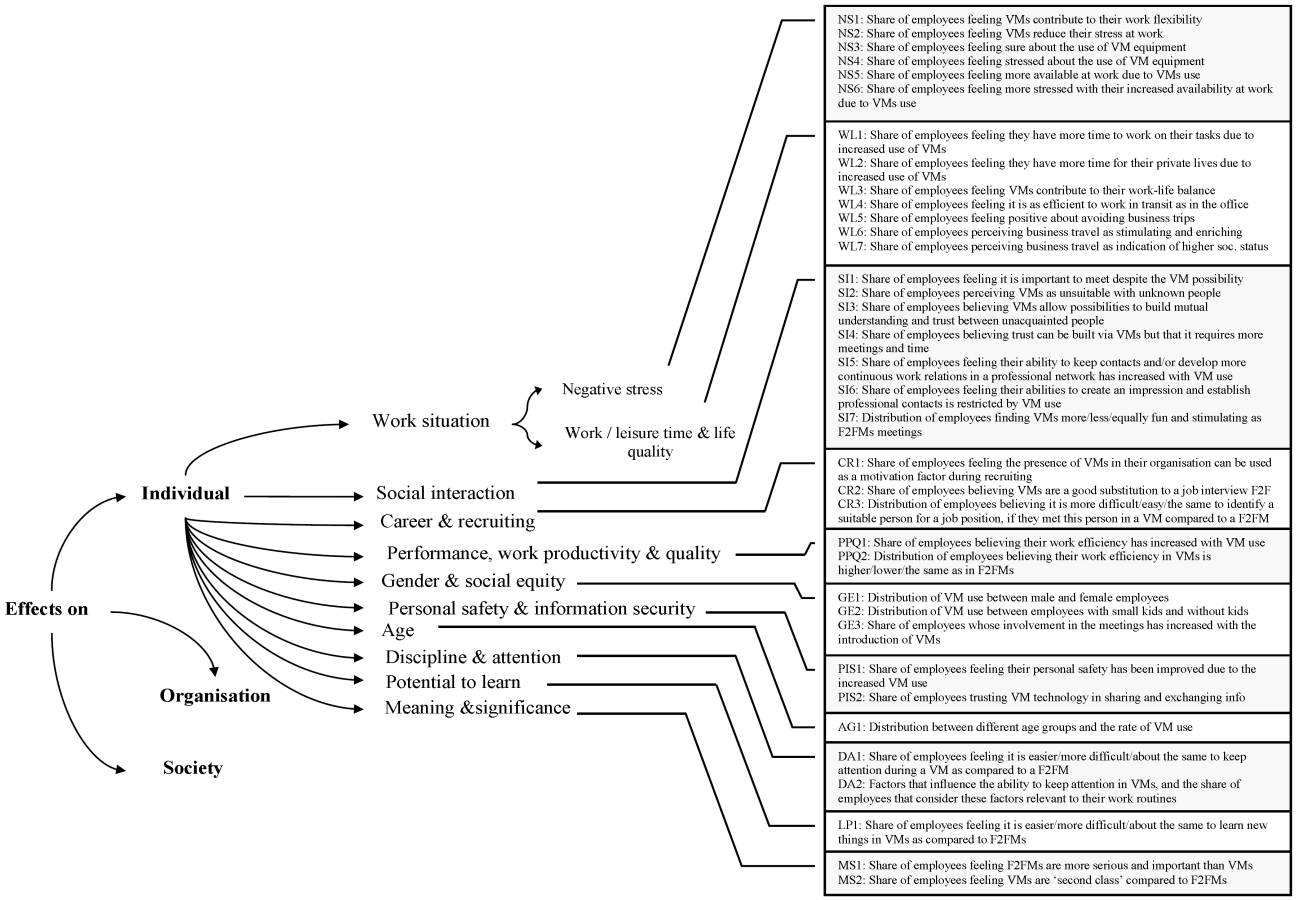

Figure 4. Indicators of potential VM effects on individual employees

These indicators were assessed using a three degree scale to identify the ones that are important (relevant) and desired for the evaluation of individual effects from VMs in Swedish public authorities (Table 1). Initially both easy and difficult to measure indicators have been mapped to avoid a common problem of indicator developers, who might "tend to concentrate (first) on developing indicators of those things that are easiest to measure" and therefore avoiding the risk of missing important variables(Freeman and Soete 2009).

Table 1. Indicator assessment matrix

Category	***GREEN (G)***	***YELLOW (Y)***	***RED (R)***
Importance (relevance) to measure	Important (relevant)	Relatively important (relatively relevant)	Not important/ not relevant
Feasibility to measure	Easy	Somewhat difficult	Difficult
Importance (relevance) and feasibility to follow up	Important (relevant) and easy	Relatively important (relatively relevant) and / or somewhat difficult	Not important (not relevant) and/or difficult

Brutto indicators were assessed based on the inputs from literature, expert and stakeholder consultations and a pilot survey tested in nine Swedish public authorities among 36 VM users (see Section 2.3.1 for details). First, each indicator has been given a grade in three assessment categories: 1) importance (relevance) to measure; 2) feasibility to measure; 3) importance (relevance) and feasibility to follow up (Table 1). When grading the indicators, experts have been consulted and included researchers and practitioners with at least five years of work experience with information and communication technologies (ICTs), VMs and / or the context of Swedish public authorities.

After this preliminary assessment, a list of indicators has been selected, which received either three Gs or two Gs and one Y. The discussion of pre-selected indicators accounted for the importance and feasibility to follow them up, after which a final list of 20 indicators was proposed. Based on this list, a pilot survey was developed to evaluate potential VM effects on individual employees in Swedish public authorities and tested in nine Swedish public authorities (see sub-section 2.3.1 for details). After the pilot survey, the formulations of questions and corresponding indicators were refined, and the main survey was launched. Indicators of individual effects from VMs, which were selected for the measurement in the main survey in three Swedish public authorities, are presented in Table 2. These include nine indicators that are important and easy to measure and follow up, five that are important but less easy to measure and follow up, and six that are relatively important and easy to measure and follow up.

Table 2. Indicators of potential VM effects on individuals measured in the main survey

#	Indicator group	Code #	Indicator
IMPORTANT AND EASY TO MEASURE AND FOLLOW UP			
1a	**Negative stress**	**NS 2**	*Share of employees feeling that VMs reduce their stress level*
		NS 3	*Share of employees feeling unsure about the use of VM equipment*
1b	**Work/leisure time and life quality**	**WL 1**	*Share of employees for whom VMs set free time which they use for other work*
		WL 2	*Share of employees for whom VMs set free time outside work*
		WL 5	*Share of employees who prefer to reduce their business trips*
2	**Social interaction**	**SI 7**	*Share of employees experiencing that particular meeting forms are more fun and stimulating than the others*
3	**Career and recruiting**	**CR 1**	*Share of employees who believe the attractiveness of their organisation as a workplace can increase due to the work flexibility offered by VMs*
		CR 2	*Share of employees who believe particular meeting forms are applicable for parts of the employment process*
5	**Gender and social equity**	**GE 2**	*Distribution of VM use between employees with small kids and without kids*
IMPORTANT BUT LESS EASY TO MEASURE AND FOLLOW UP			
4	**Performance, productivity and quality**	**PPQ 1**	*Share of employees who experience their work productivity has increased with the use of VMs*
		PPQ 3	*Share of employees who experience their work quality has increased with the use of VMs*
5	**Gender and social equity**	**GE 3**	*Share of employees feeling they have an increased ability to participate and be well-informed at their workplace due to the use of VMs*
		GE 4	*Share of employees feeling VMs restrain their ability to express themselves*
7	**Discipline and attention**	**DA 2**	*Factors that contribute to the ability to keep attention in VMs, and the share of employees that consider these factors relevant to their work routines*

Table 2. Indicators of potential VM effects on individuals measured in the main survey (continued)

#	Indicator group	Code #	Indicator
RELATIVELY IMPORTANT AND EASY TO MEASURE AND FOLLOW UP			
1b	**Work/leisure time and life quality**	**WL 6**	*Share of employees who think business travelling is stimulating and enriching*
		WL 7	*Share of employees who believe that business travelling is an indication of (high) status*
5	**Gender and social equity**	**GE 1**	*Distribution between different gender groups and the rate of VM use*
7	**Age**	**AG 1**	*Distribution between different age groups and the rate of VM use*
10	**Meaning and significance**	**MS 1**	*Share of employees experiencing that VMs are used to handle less important or serious topics*
		MS 2	*Share of employees believing that the choice of some meeting forms over others indicates that the meeting is of less importance*

2.2.2 Virtual meetings and organisations

Indicators for covering all categories of organisational effects require other type of information than the subjective answers provided by respondents in a survey. For instance we need to look into base data such as:

- Organisational data (e.g. number of employees, staff turnover and number of departments);
- Financial data (e.g. turnover, EBIDTA[3]);
- Time use data.

There is also a need to collect and analyse specific or iteratively gathered data, such as:

- Travelling levels;
- Use levels of implemented technical solutions;
- Resource use (e.g. energy, emissions);
- Employee surveys or interviews.

The survey includes questions that relate to the respondents' attitudes to the nature of their work, and their own appreciation of quality and productivity (see Annex I for details). The purpose of these questions is to explore the use of VMs in relation to organisational efficiency. The survey also includes questions about the respondents' perception of VM impact on the staff turnover and the attractiveness of their employer, which is assumed to entail effects on staff turnover, aggregated satisfaction and the

[3] Earnings before interests, depreciation, taxes and amortisation

organisation's possibilities to attract and retain competence. Therefore the main focus of the survey from the organisational perspective has been to search for the evidence that support or reject the existence of effects in the areas of organisational efficiency and staff. In order to explore the organisational effects of VMs, the following indicators have been developed:

- PPQ1: Share of employees who think their work productivity has increased with the use of VMs;
- PPQ3: Share of employees who experience their work quality has increased with the use of VMs;
- STO1: Share of employees who believe that VMs contribute to a decrease in staff turnover;
- SOA1: Share of employees who believe that VMs make the organisation more attractive as an employer.

Respondents in *leading positions* include employees either responsible for personnel (e.g. unit managers) or those who are in other types of managerial positions (e.g. project managers). The reason why this indicator group has been selected for a separate analysis is due to account for a relatively larger influence over work methods and tools in the long run by the respondents in the leading positions.

- PPQ1L: Share of employees in leading positions who think their work productivity[4] has increased with the use of VMs;
- PPQ3L: Share of employees in leading positions who experience their work quality has increased with the use of VMs;
- STO1L: Share of employees in leading positions who think that VM contribute to a decrease in staff turnover;
- SOA1L: Share of employees in leading positions who think that VM makes the organisation more attractive as an employer.

High frequency users are defined in this study as those who use either type of VM technologies (i.e. audio-, video- or web-conferencing) at least every month. It is interesting to explore whether these users are more or less inclined to agree to the fact that VMs affect their work productivity and quality. *Experienced users* are respondents who have worked with at least two VM technologies for three years or longer, or with one technology for three years or longer and with the other two for at least one year each.

- PPQ1F: Share of high frequency users who think their work productivity has increased with the use of VMs;
- PPQ3F: Share of high frequency users who experience their work quality has increased with the use of VMs;
- PPQ1E: Share of experienced users who think their work productivity has increased with the use of VMs;
- PPQ3E: Share of experienced users who experience their work quality has increased with the use of VMs.

[4] **Efficiency** is understood as an *output in relation to resource input*. Maximising efficiency is about getting as much output as possible out of labour, money, time or other resources, i.e. doing things the right way. **Productivity** is related to efficiency, but adds to the equation also the concept of value, the *value of the output in relation to resource input.* Productivity is about getting utility out of activities, i.e. doing the right things. An organisation can be very efficient, making use of its resources with little waste, but if the value of the output is low, such organisation has low productivity

2.3 Survey

The survey comprised two major steps and included a pilot survey performed in nine Swedish public authorities in autumn-winter 2012, and a main survey launched in February 2013 and performed in three Swedish public authorities. Further details and practicalities of these two surveys as well as the reasons for public authority selection are provided in this section.

2.3.1 Performance of the pilot survey

Netto lists of indicators for potential effects from VMs on individual employees and organisation were used to design survey questions. The questions were first tested in a pilot survey in nine Swedish public authorities in autumn-winter 2012. The pilot survey was launched as an online anonymous survey with the help of a software tool Survey Methods[5], and the web-link was sent to contact persons in nine Swedish public authorities including Transport Administration, Energy Agency, Environmental Protection Agency, Social Insurance Agency, Customs, Central Agency for Student Aid, the Board of Agriculture, Land Surveying Agency and Civil Contingencies Agency.

The pilot survey yielded 34 responses as well as more detailed feedback and comments from 10 respondents. The comments mainly argued for the need to rephrase or remove particular questions. Table 3 provides a list of public authorities who participated in a pilot survey, indicates a number of total and partial responses to this survey as well as number of people commented on the survey structure and/or content.

Table 3. Pilot survey performance

#	*Swedish public authority*	*Full responses*	*Partial responses*	*Comments and feedback*
1	*Central Agency for Student Aid*	2	1	
2	*Swedish Energy Agency*	3		
3	*Swedish Social Insurance Agency*	5	2	3
4	*Swedish Transport Administration*	3	3	2
5	*Swedish Customs*	7	2	1
6	*Swedish Civil Contingencies Agency*	3	1	2
7	*Swedish Board of Agriculture*		1	
8	*Land Surveying Agency*		1	
9	*Swedish EPA*			2
	TOTAL	23	11	10
	TOTAL RESPONSES	**34**		

After the refinement of the questions by the research team, the main survey was launched.

2.3.2 Performance of the main survey

The main survey was launched as an online anonymous survey with the help of Survey Methods software on 1 February 2013 in three Swedish public authorities including Energy Agency (SEA), Environmental Protection Agency (SEPA) and Transport Administration (STA). Background information and key facts about these organisations are provided in section 2.3.3. These organisations were selected for the survey implementation as they have:

[5] For more information visit www.surveymethods.com

- a relatively high level of virtual maturity[6], which is reflected in their experience of VM use;
- a need for business travel and meetings outside an everyday working place;
- a need/interest for VM use in their internal work routines;
- a need/interest for VM use with colleagues externally;
- a significant share of employees who have been using VMs in their work.

Table 4 summarises key survey performance data for the three selected Swedish public authorities.

Table 4. Survey performance data

	SEA	***SEPA***	***STA***
Sample size	376	530	410
Total responses	113	241	222
Complete responses	96	205	188
Partial responses	17	36	34
Response frequency	26-30%	39-45%	46-54%
Actual survey activity	ca. 11 weeks	ca. 4 weeks	ca. 8 weeks

In SEA and SEPA the sample included all employees in the organisation due to a relatively small size of each organisation, i.e. 376 and 530 employees correspondingly. A sample in STA comprised 410 employees, who both travelled for work and used at least one type of VMs (i.e. audio-, video- or web-conference) in their work routines. Such selection criteria ensured that respondents had their own opinion and understanding of the advantages and disadvantages, which VMs had to offer.

The web-link to the survey was sent via e-mail to a contact person in each of the three public authorities. The contact person then forwarded the web-link to potential respondents or posted it on the Intranet bulletin board in his/her organisation. A brief description of the survey purpose was provided in the survey opening message (see Annex II) as well as was emphasized in the first communication with potential respondents.

Surveys in all three organisations were kept open for six months, i.e. between 1 February and 1 August 2013. The actual survey activity (i.e. time span between the first and the last recorded response) varied from 4 to 11 weeks. Two reminders were sent during this period to potential survey respondents in SEA and SEPA in order to achieve a minimum acceptable response rate of 30%. No reminders were sent to STA due to a satisfactory response rate of over 46% from the first attempt.

2.3.3 Organisations of the main survey

Swedish Energy Agency (SEA)

SEA has 376 employees and is located in Eskilstuna and Stockholm. The agency is governed and gets its appropriation from the Swedish Ministry of Enterprise, Energy and Communications. The mission of the agency is to work for the use of renewable energy, improved technologies, a smarter end-use of energy, and mitigation of climate change.[7] Apart from its own employees, the agency is very dependent on the competence of external specialists within specific areas, who work as consultants for the agency.

[6] *Virtual maturity* - a degree to which virtual technologies are established and integrated into the organisation's work routines

[7] http://energimyndigheten.se/en/About-us/

SEA has taken the implementation of VM and virtual collaboration capabilities and tools quite far. Internally there are applications of audio-conferencing and web-conferencing such as Microsoft Lync (and earlier Live meeting). There are also instant messaging and file sharing solutions in place. For video-conferencing the organisation has been using Cisco Tandberg and there is also the possibility to employ Cisco Webex for external web-meetings.

Swedish Environmental Protection Agency (SEPA)

SEPA has about 530 employees in two different locations, where 460 work in Stockholm and 70 in Östersund. The agency is governed by the Swedish Ministry of Environment and its responsibilities include monitoring conditions in the environment and progress in environmental policies.[8]

The technical solutions implemented at SEPA include audio-conferencing as well as video-conferencing, which is purchased as an external service. For web-conferencing, which in comparison to the other two organisations in this study is used relatively less, the organisation applies Webex.

Swedish Transport Administration (STA)

STA was created from a merger of the Road and the Railroad Administrations and some minor transport related administrations on the 1st of April 2010. STA is responsible for the planning of new roads for transport on the ground, in the air, on the sea or by rails. STA has about 6 500 employees and is located in seven different places with its head office in Borlänge. STA is also governed by the Ministry of Enterprise, Energy and Communications.

When the Swedish Transport Administration was created, the authority inherited two different VM approaches, one from the Road Administration and one from the Railroad Administration. These two administrations had different video-conferencing solutions and different telephone communication solutions. Today, the existing video-conferencing solutions have been abandoned. Instead the organisation has implemented Microsoft Lync as the primary solution for web-conferencing.

[8] http://www.swedishepa.se/About-us/

3 Results

This chapter presents results from the survey on VM effects on organisation and its employees in Swedish public authorities. The results are structured in line with the indicator categories presented in section 2.1. Findings on specific indicators in each category are described and in most cases illustrated with graphs.

3.1 Virtual meetings and individuals

Survey data has been collected for 20 indicators of VM effects on individuals in eight categories (Table 2). These categories include negative stress and work/leisure time and life quality; social interaction; career and recruiting; performance, work productivity and quality; gender and social equity; age; discipline and attention; and meaning and significance. Data has not been collected in two indicator categories namely personal safety and information security, and potential to learn, as these were not selected as important or relevant within the framework of this research project.

3.1.1 Negative stress

On the one hand, VMs can contribute to personal stress reduction in all stages of business travel (i.e. pre-trip, during trip and post-trip) as they substitute such travel (Arnfalk and Kogg 2003; Cisco 2008a; Gustafson 2006; Gustafson 2012; Räsänen et al. 2010; Ivancevich, Konopaske, and Defrank 2012; Striker, Dimberg, and Liese 2000). On the other hand, personal stress levels when conducting a VM can increase due to the uncertainty in handling hard- and/or software (Picha and Räsänen 2011; Räsänen et al. 2010; Räsänen 2006). During in-depth interviews with employees at Swedish public authorities it has been found that those employees who felt confident about handling VM equipment had not experienced any related stress, while those less experienced in this area had felt higher stress.

Both above mentioned implications of VM use have been taken up in the survey by measuring two stress related indicators:

- NS 2: Share of employees feeling that VMs reduce their stress level (question 28 in Annex I) (Figure 5); and
- NS 3: Share of employees feeling unsure about the use of VM equipment (question 29 in Annex I) (Figure 6).

On average 44% of respondents in three studied organisations perceived that the use of VMs contributed to the reduction of their stress levels with this figure varying from 39% at Swedish EPA to 49% at Swedish Energy Agency. For 77% of respondents in three public authorities VMs reduced stress levels at least to a certain extent (Figure 5).

When it concerns VM equipment use, 24% of employees in three studied organisations felt unsure and 54% at least to a certain extent unsure about handling VM equipment and/or experienced a risk that the meeting would not work out without technical problems. In the case of audio-conferences the latter figure was 40%, video-conferences - 63%, and web-conferences – 59%. On the contrary, on average in three organisations 53% felt sure about using audio-conference equipment, 20% - video-conference equipment, and 19% - web-conference equipment (Figure 6).

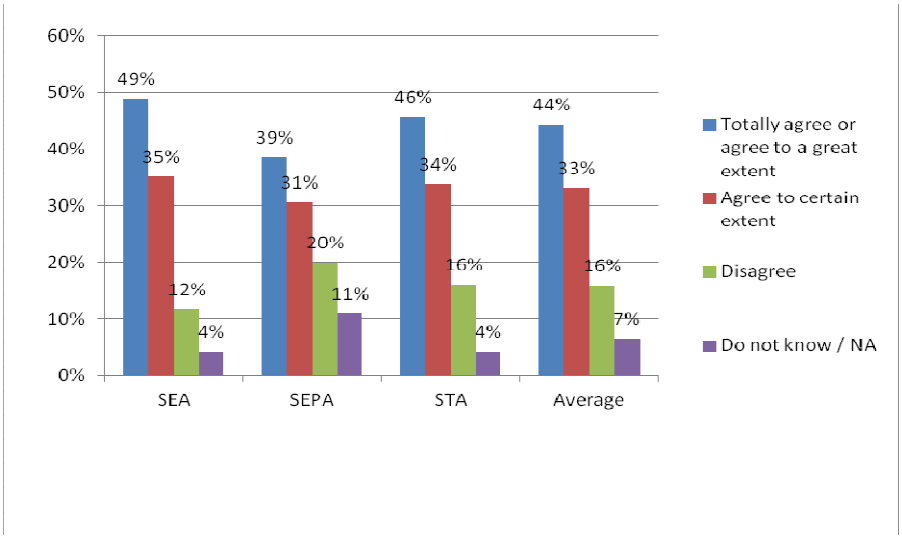

Figure 5. Share of employees feeling that VMs reduce their stress level

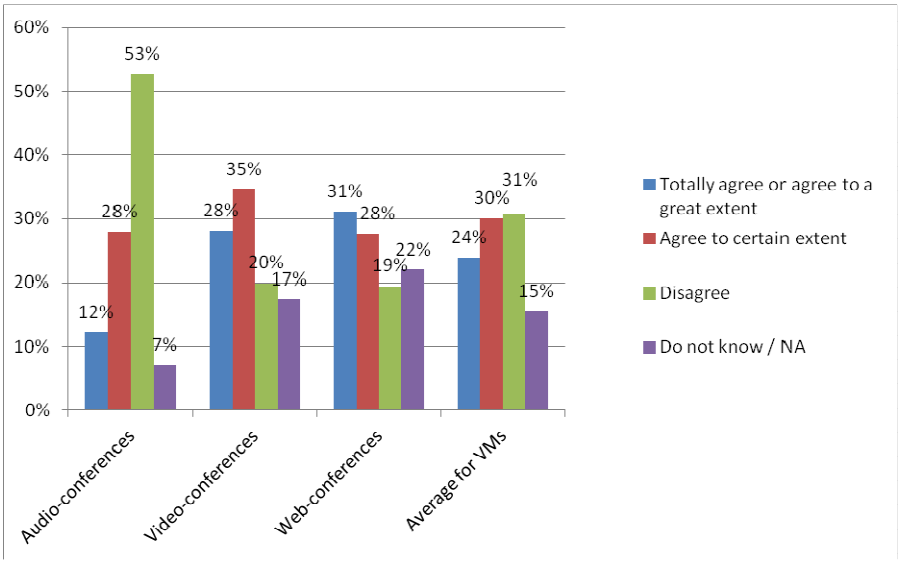

Figure 6. Share of employees feeling unsure about the use of VM equipment (aggregated result for three public authorities)

These figures differ somewhat between the studied public authorities (Figures Figure 7Figure 9). The biggest difference is in the use of web-conference equipment with 47% feeling unsure about it in SEA (Figure 7), 39% in SEPA (Figure 8) and only 14% in STA (Figure 9). Concerning the use of video-conference equipment, 42% of respondents in STA did not have any opinion on that while this share was as low as 4% in the SEPA and 0% in SEA.

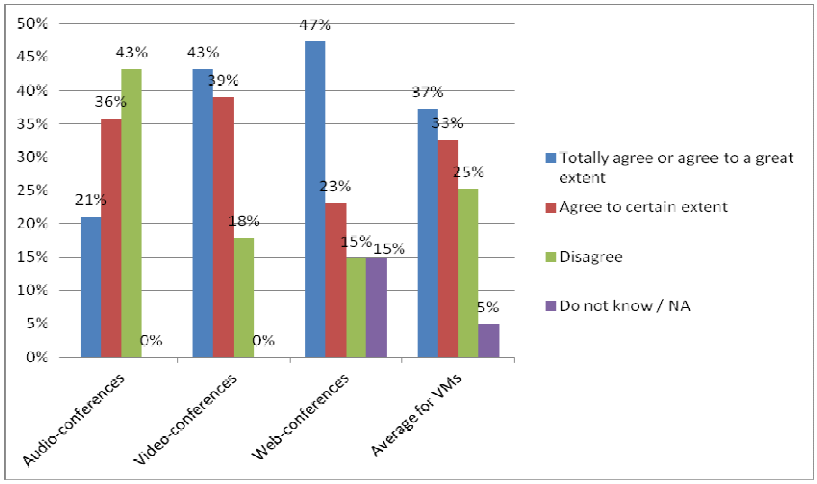

Figure 7. Share of employees feeling unsure about the use of VM equipment (SEA)

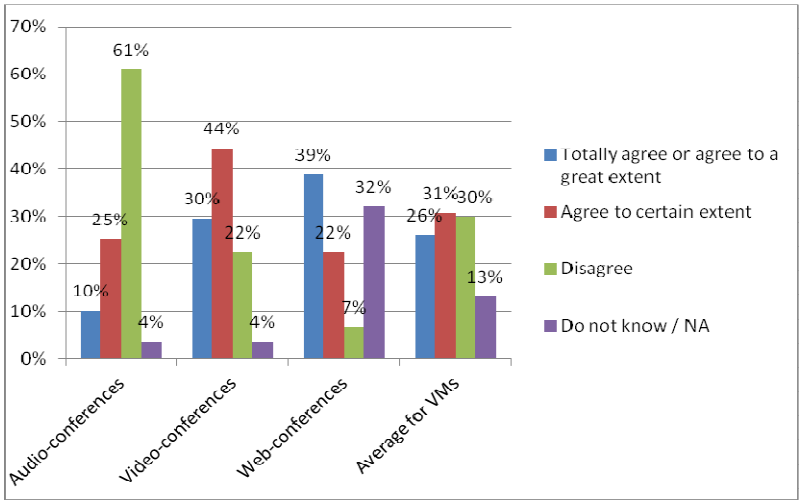

Figure 8. Share of employees feeling unsure about the use of VM equipment (SEPA)

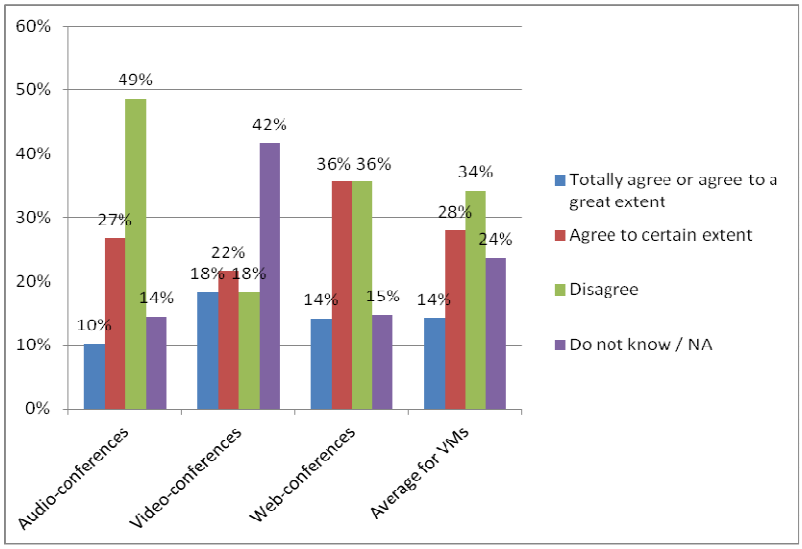

Figure 9. Share of employees feeling unsure about the use of VM equipment (STA)

3.1.2 Work/leisure time and life quality

By saving time, reducing stress linked to travelling (Denstadli, Julsrud, and Hjorthol 2012; Cisco 2008a) and providing better flexibility to work routines (Räsänen 2006) VMs can contribute to the improved quality of life and a better work-life balance (Arnfalk 2012). VMs are also recognised to contribute to time saving when they substitute F2FMs (Denstadli, Julsrud, and Hjorthol 2012; Cisco 2008a) as well as due to the fact that VMs are generally shorter than F2FMs (Pate Dwyer 2007; Denstadli, Julsrud, and Hjorthol 2012; Räsänen et al. 2010).

The survey measured two indicators related to potential time savings when VMs substitute business travelling:

- WL 1: Share of employees for whom VMs set free time which they use for other work (question 26 in Annex I) (Figure 10); and
- WL 2: Share of employees for whom virtual meetings set free time outside work (question 27 in Annex I) (Figure 11).

The survey results show that in three studied organisations VMs save working time at least to a certain extent for 92% of respondents (Figure 10) and private time for 86% of respondents (Figure 11).

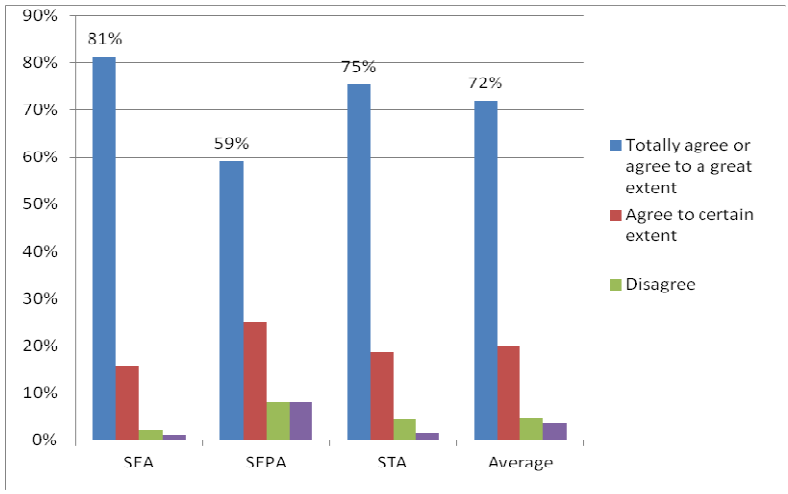

Figure 10. Share of employees for whom VMs set free time which they use for other work

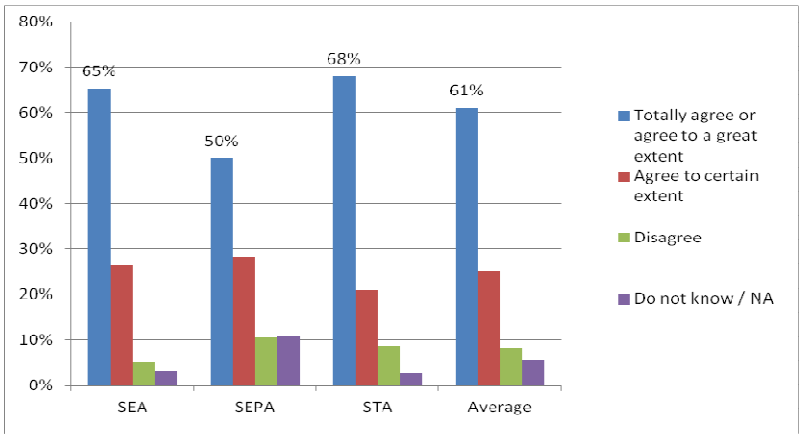

Figure 11. Share of employees for whom virtual meetings set free time outside work

Travelling in general sometimes can be perceived as "stimulating and enriching", as "a source of variation and new experiences" (Gustafson 2006), "intriguing, educational, career enhancing, exciting and challenging" (Ivancevich, Konopaske, and Defrank 2012) as well as an indication of social status. A study performed at Telia Research AB had showed that 50% of employees considered business travel as an indication of social status, and 70% enjoy getting out of the office (Arnfalk and Kogg 2003).

During in-depth interviews in Swedish public authorities within this project the opinions among respondents on whether travel was an indication of higher social status diverged. While some interviewees considered travel to have no connection to status, others felt these two variables were closely linked (i.e. the higher one's status is, the more one travels). This was somewhat difficult to explain based on results from a qualitative study, and therefore the following indicator was measured in this survey:

- WL 7: Share of employees who believe that business travelling is an indication of (high) status (question 11 in Annex I) (Figure 12).

The survey has also collected data on two other indicators related to personal experience of business travelling by employees in studied public authorities:

- WL 5: Share of employees who prefer to reduce their business trips (question 11 in Annex I) (Figure 13);
- WL 6: Share of employees who think business travelling is stimulating and enriching (question 11 in Annex I) (Figure 14).

Survey results show that on average 14% of respondents in three studied organizations find business travelling to be an indication of (high) status with this figure ranging from 11% in SEPA to 19% in SEA (Figure 12).

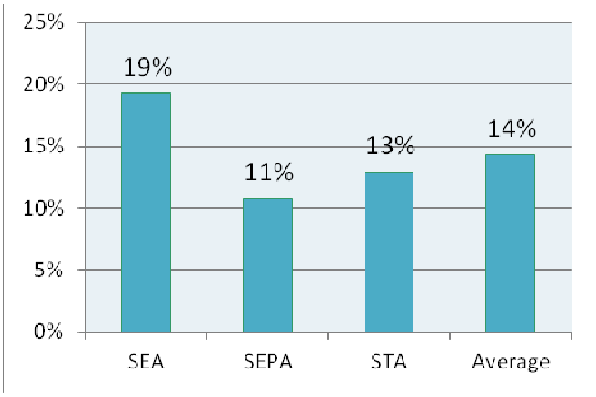

Figure 12. Share of employees who believe that business travelling is an indication of (high) status

When it concerns the desire to reduce business trips, the highest figure of 26% corresponds to the respondents in Transport Administration while is nearly two times lower in SEA (12%) and SEPA (15%) (Figure 13). At the same time 61% of respondents both in SEA and SEPA find travelling stimulating and enriching while 49% find it as such in STA (Figure 14).

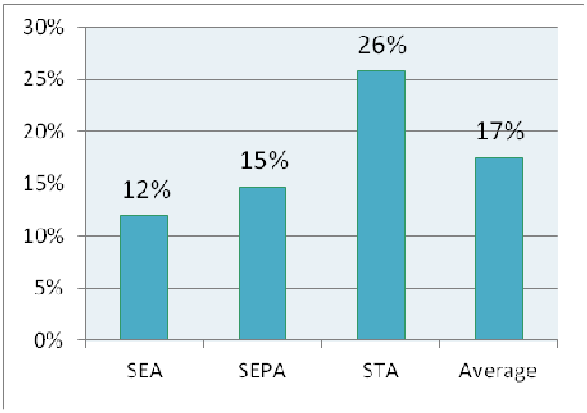

Figure 13. Share of employees who prefer to reduce their business trips

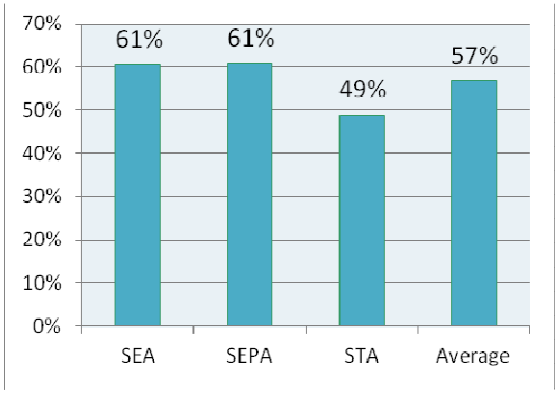

Figure 14. Share of employees who think business travelling is stimulating and enriching

3.1.3 Social interaction

An important comparative aspect of meeting forms is their potential to deliver entertaining experiences. VMs are often perceived as more intensive, rigid, unsuitable for social chitchat and have limited potential to combine a meeting with other social events (Arnfalk 2012). In-depth interviews in Swedish public authorities within this project have not yielded any uniform opinion on this matter. Many respondents find that VMs underscore face-to-face meetings (F2FMs) when it concerns on how fun and stimulating VMs are, while a number of opinions supported the fact that the meeting form does not define such meeting features.

This survey therefore aimed to collect quantitative data in studied organisations on the following indicator:

- SI 7: Share of employees experiencing that particular meeting forms are more fun and stimulating than the others (question 15 in Annex I) (Figure 15).

Survey results demonstrate that 72% of respondents in three public authorities find F2FMs more fun and stimulating than any form of VMs with this figure varying from 67% both in SEA and SEPA to 83% in STA. Among different types of VMs the preference on this evaluation criterion is given to video-conferences in SEA and SEPA (21% and 25% correspondingly) and to web-conferences in STA (11%). Only 2% of respondents find audio-conferences more fun and stimulating than other meeting forms (Figure 15).

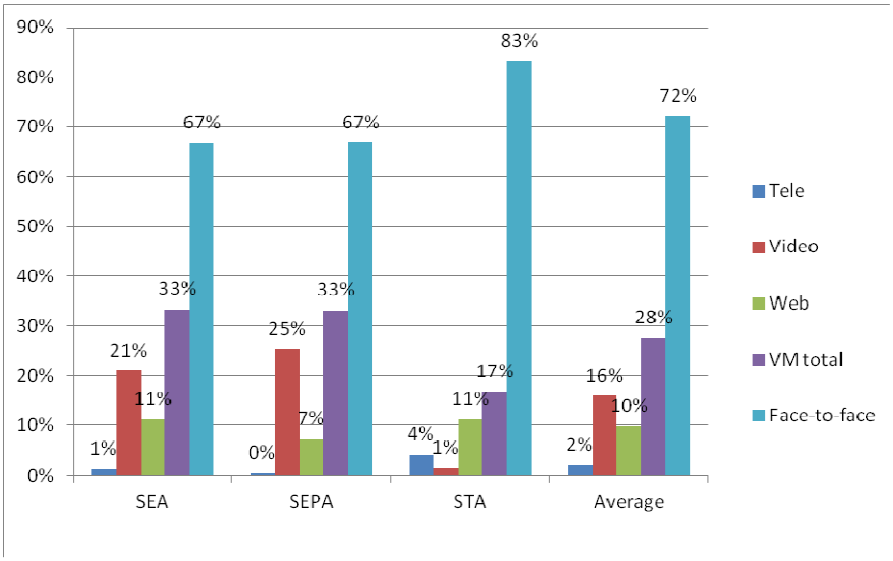

Figure 15. Share of employees experiencing that particular meeting forms are more fun and stimulating than the others

3.1.4 Career and recruiting

There is a hypothesis (Arnfalk 2012) that F2FMs with managers, project leaders and partners are important for career advancement due to a closer personal contact and easier trust development, and that VMs are not able to replace such tacit benefits. On the other hand, VMs can enhance possibilities to keep in touch and therefore open new career opportunities for employees (Arnfalk 2012). Furthermore VMs may increase professional performance of employees thus contributing to career advancement(Arnfalk 2012).

In-depth interviews in Swedish public authorities within this project examined among other things whether the presence of VMs in an organisation can be used as a motivation factor in the recruitment process or not. Diverging opinions have been encountered in regards to this evaluation parameter. Therefore this survey sought to measure the following indicator:

- CR 1: Share of employees who believe the attractiveness of their organisation as a workplace can increase due to the work flexibility offered by VMs (question 23 in Annex I) (Figure 16).

Overall half of all respondents in three studied public authorities believe that VM use can increase the attractiveness of their organisation as a workplace, and 83% think that VMs can do so at least to a certain extent.

Another potential advantage of VMs in relation to career encompasses the facilitation of employment interviews without travelling (Räsänen et al. 2010). While some respondents during in-depth interviews indicated they would not carry out a job interview with the help of a VM, others found virtual techniques as a useful tool at least during certain stages in the selection of candidates for a certain job position.

Such varied opinions could be linked to the routines established in organisations, which the respondents represent (e.g. some organisations conduct video or telephone interviews to shortlist candidates before they invite them for a personal interview, others would like to get a broader selection of candidates from different geographical regions etc.). This is, however, a hypothesis, and only a quantitative study can prove whether any statistical difference exists. Therefore this survey sought to measure the following indicator:

- CR 2: Share of employees who believe particular meeting forms are applicable for parts of the employment process (questions 17, 18 in Annex I) (Figure 17)

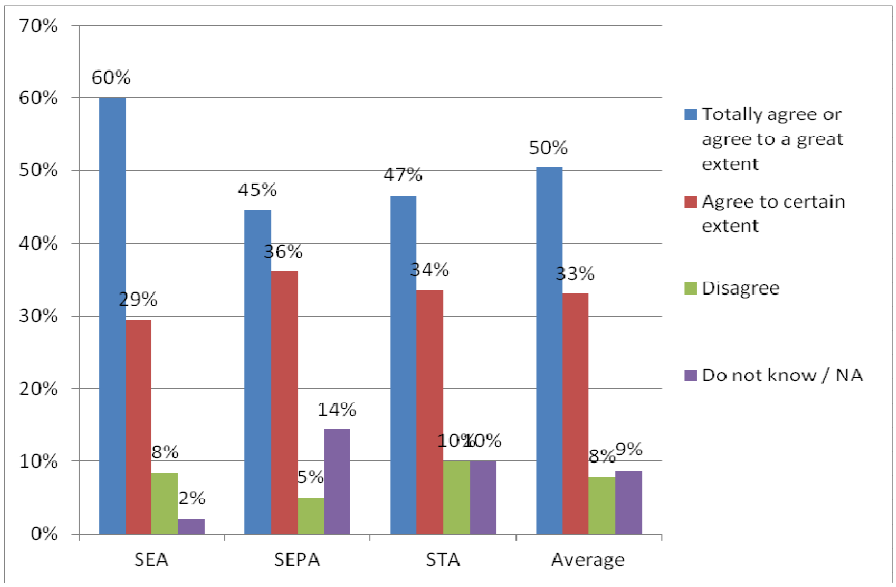

Figure 16. Share of employees who believe the attractiveness of their organisation as a workplace can increase due to the work flexibility offered by VMs

It is clear from the survey results that F2FMs are preferred over VMs when it concerns the employment process. In three studied organisations 72% of respondents believe that F2FMs are more applicable than VMs for the parts of the employment process with this figure varying from 64% in SEA, 71% in SEPA to 80% in STA. When it concerns specific VM forms, SEA and SEPA prefer video-conferences while employees at STA would rather choose web-conferences (Figure 17).

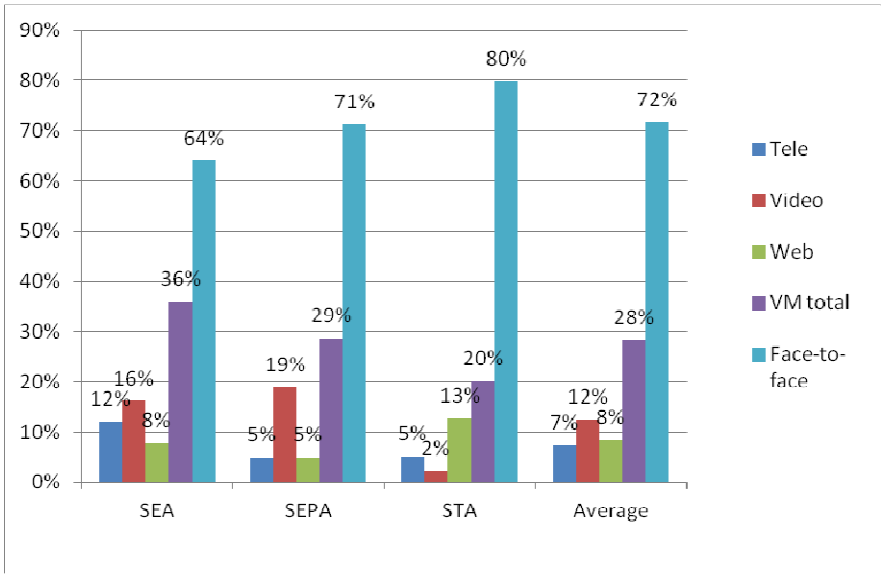

Figure 17. Share of employees who believe particular meeting forms are applicable for parts of the employment process

3.1.5 Gender and social equity

Work-related travel is known to be "a predominantly male activity" (Bergman 2004; Presser and Hermsen 1996) regardless of the family situation (Gustafson 2006; Presser and Hermsen 1996). However, no explicit description has been found on VM implications (if any) related to gender equity.

At the same time international (Duncan et al. 2003) and Swedish (Gustafson 2006; Björnberg 2002) studies indicate that women are still expected to take the main responsibility for home and family. The latter might limit career development for many women, and therefore VMs might positively contribute to women's career opportunities by enhancing their work flexibility. This is also relevant for men, who get higher chances to engage in family responsibilities. Such VM implications are likely to gain significance in the changing world, where the full-time paid work by men and women and their equal participation in household tasks becomes more and more common (Duncan et al. 2003; Gustafson 2006).

In-depth interviews with representatives at Swedish public authorities, which were carried out in the framework of this project, have not yielded any uniform opinion on whether VMs have implications for gender equity or not. This survey intended to identify among other issues whether there is any difference between men and women on how often they use VMs in their work routines. Therefore the following indicator was measured:

- GE 1: Distribution between different gender groups and the rate of VM use (questions 1, 12 in Annex I) (Figure 18-Figure 20).

For this purposes the rates of audio-conference, video-conference and web-conference use were estimated in three Swedish public authorities separately for male and female employees. When it concerns audio-conferences (Figure 18), half of all surveyed men use audio-conferences from once per month up to four times per week while only 39% of women do so. At the same time 53% of all asked women either never use audio-conferences or use them less than once per month while this figure for men is 44%. A statistical test, however, needs to be performed to find out whether there is any statistically significant difference between men and women on this variable. Among users, who apply audio-conferences more frequently (i.e. daily or several times per day), there does not seem to be any difference between men and women.

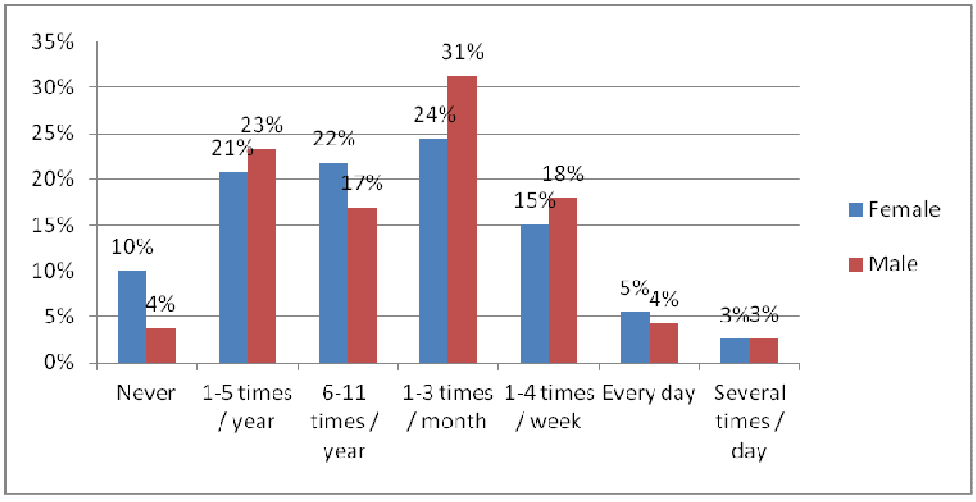

Figure 18. Distribution between different gender groups and the rate of audio-conference use in three studied organisations

When it concerns video-conferences (Figure 19), 23% of women and 23% of men have never applied video-conferences in their work routines. The majority (59% of women and 62% of men) use video-conferences from once per year till 3 times per month. Marginal 2% of women and 3% of men use video-conferences daily or several times per day.

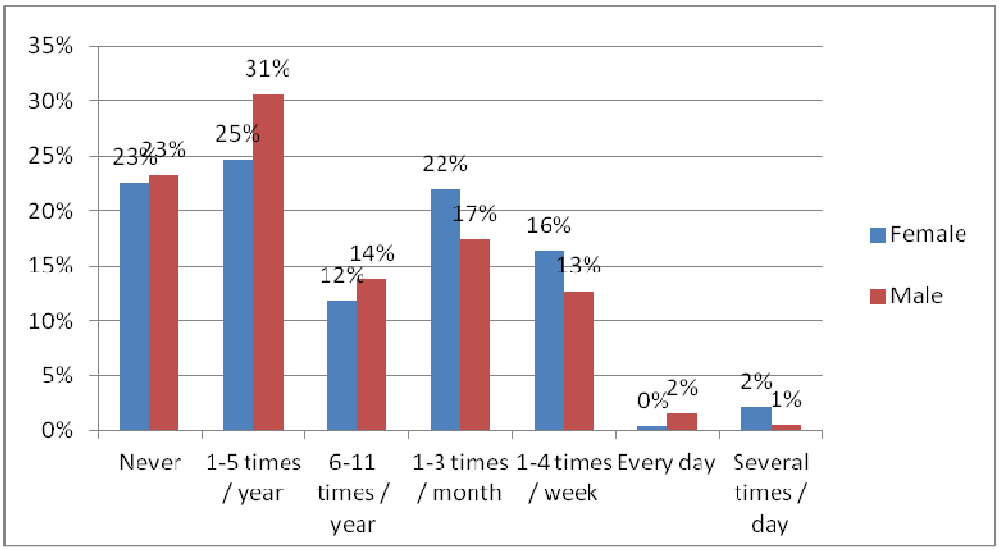

Figure 19. Distribution between different gender groups and the rate of video-conference use in three studied organisations

When it concerns web-conference use (Figure 20), 43% of women and 28% of men have never used this VM tool in their work routines. To establish whether there is any significant difference between these figures due to gender requires a relevant statistical test. Both for male and female employees there is a clear trend of a relatively low rate of web-conference use as compared to audio- and video-conferences. This said, 72% of women and 59% of men either do not use web-conferences or use them less than once in two months. On the other hand, 9% of women and 9% of men use web-conferences daily or several times per day, which is higher than the same figures for other VM forms. These figures need to be followed up with an in-depth analysis of individual answers and qualitative comments among such users to derive possible explanations for the observed pattern.

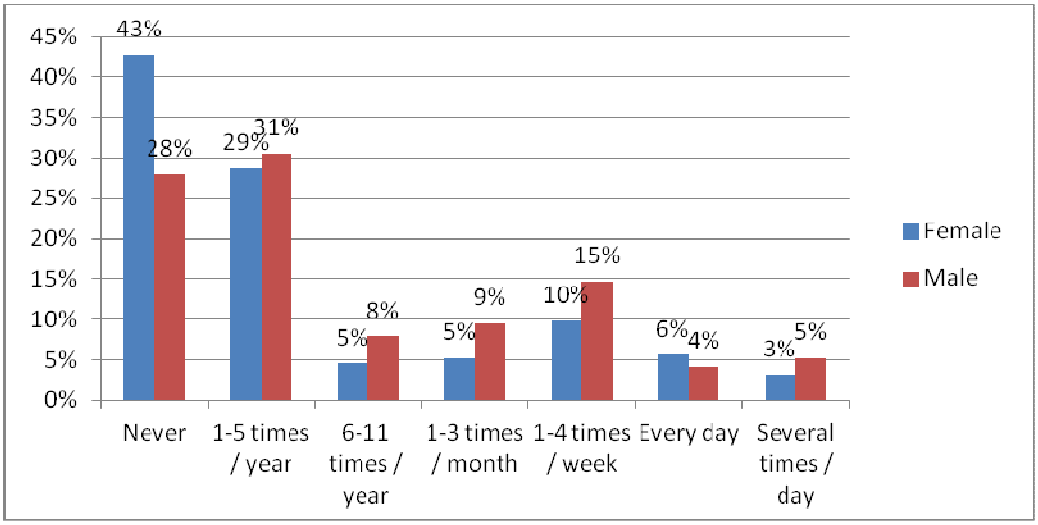

Figure 20. Distribution between different gender groups and the rate of web-conference use in three studied organisations

VMs can potentially provide a meeting alternative for everyone (Räsänen et al. 2010) including those restricted from business travelling for some reasons. For example, employees with small children at Telia had been particularly reluctant to travel frequently to the meetings (Arnfalk and Kogg 2003). The opinions of respondents during in-depth interviews diverged on these matters. Therefore this survey sought to measure the following indicators:

- GE 2: Distribution of VM use between employees with small kids and without kids (questions 3, 4, 12 in Annex I) (Figure 21-Figure 23);

- GE3: Share of employees feeling they have an increased ability to participate and be well-informed at their workplace due to the use of VMs (question 31 in Annex I)(Figure 24);

- GE 4: Share of employees feeling VMs restrain their ability to express themselves (question 32 in Annex I) (Figure 25).

To study the indicator GE 2, the responses of those who do not have kids in their households and who have at least one child of 10 years or younger were analysed. When assessing frequent VM use, i.e. from once per week till several times per day, 28% of respondents who have small kids and 15% with no kids use web-conferences (Figure 23). These figures are 22% and 14% correspondingly for video-conference use (Figure 22), and 26% and 22% respectively for audio-conference use (Figure 21). In all three cases respondents who have small kids at home tend to use VMs more often than those without kids, however, statistical tests need to be run to conclude whether these differences are statistically significant. When it concerns more seldom users of VMs (i.e. those who use any type of VMs three times per month or less), there does not seem to be much difference between respondents with small kids and those without kids.

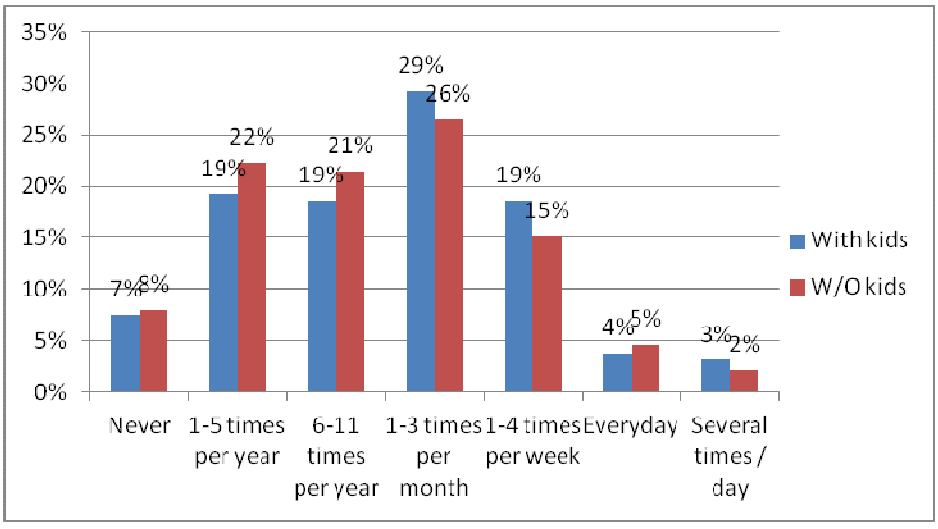

Figure 21. Distribution of audio-conference use rate between employees with small kids and without kids

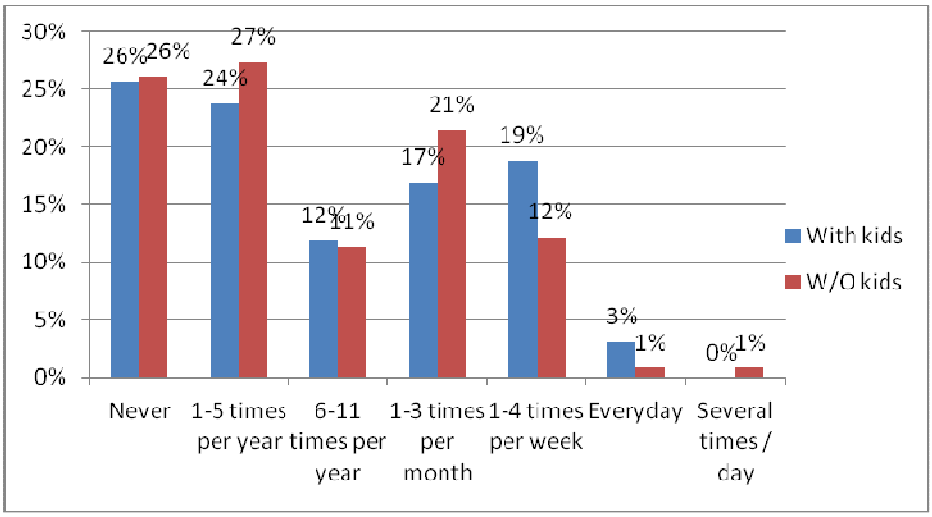

Figure 22. Distribution of video-conference use rate between employees with small kids and without kids

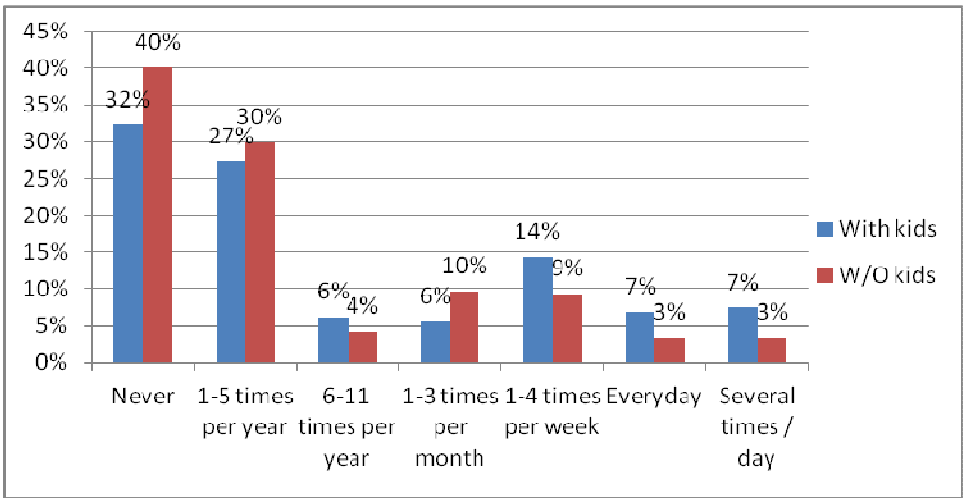

Figure 23. Distribution of web-conference use rate between employees with small kids and without kids

Survey results show that on average 60% of respondents in three studied public authorities agree at least to a certain extent that VMs have increased their ability to participate and stay well-informed at the workplace. When comparing the results between different organisations on this indicator, a somewhat higher figure of 75% is reported for STA while this figure is 50% for SEA and 53% for SEPA. On average 24% of respondents disagree that VMs have increased their ability to participate and be well-informed at their workplace (Figure 24).

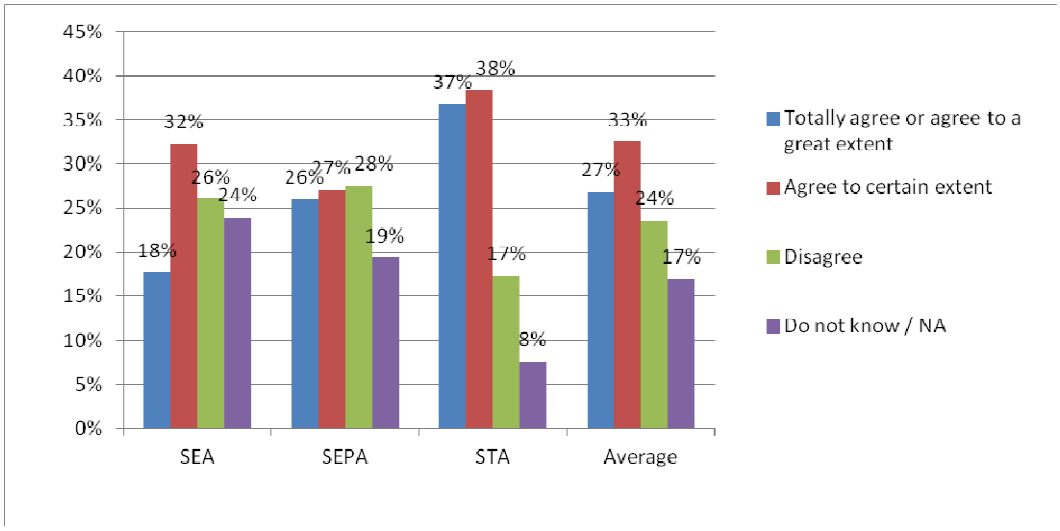

Figure 24. Share of employees feeling they have an increased ability to participate and be well-informed at their workplace due to the use of VMs

Survey results demonstrate that 53% of respondents in studied organisations do not experience that VMs restrain their ability to express themselves while 43% feel so at least to a certain extent. These figures have nearly no variation between three Swedish public authorities who participated in the survey (Figure 25).

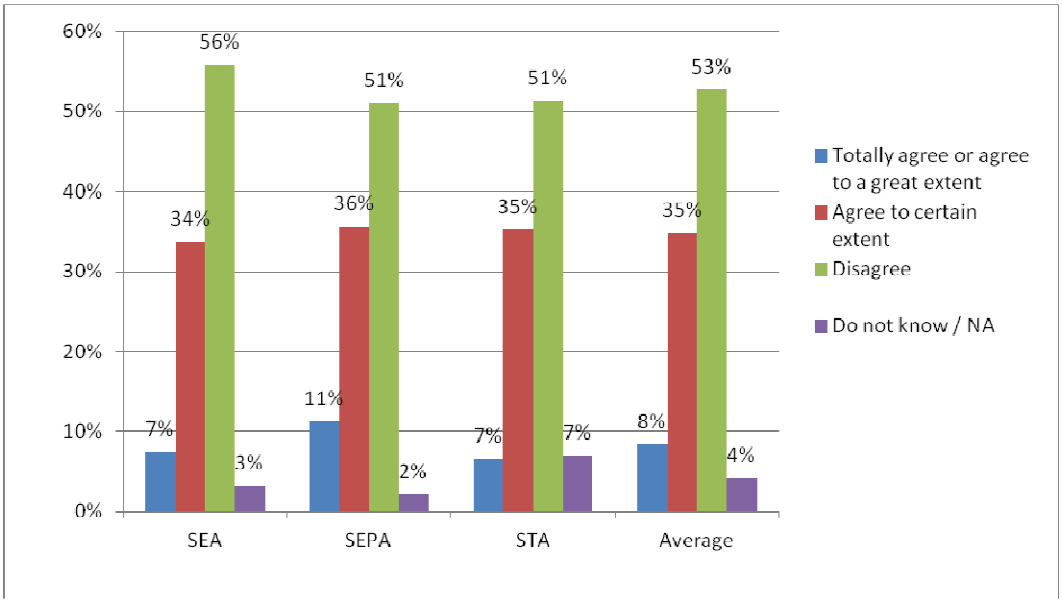

Figure 25. Share of employees feeling VMs restrain their ability to express themselves

3.1.6 Performance, productivity and quality

Individual performance at work can be evaluated in terms of one's work productivity. There is an assumption that work productivity improves with the increased VM use due to time savings from avoided travel. This has been reported in the study of Swedish media companies (Räsänen et al. 2010), where employees have been interviewed on their perceptions of VM use. With the introduction of VMs the pace of work increased (Räsänen et al. 2010). Research at Cisco shows that by avoiding travel with

computer mediated communication (CMC) employees gained productivity and improved their performance, and sometimes time savings were 24 hours or more per trip (Cisco 2008b; Cisco 2008a).

Another factor potentially contributing to work productivity is the possibility for nearly instant information transfer between the meeting participants and "more rapid identification of problems and opportunities" in VMs as compared to F2FMs (Erasmus, Pretorius, and Pretorius 2010). The survey collected data on two indicators related to work productivity and quality in three Swedish public authorities:

- PPQ 1: Share of employees who experience their work productivity has increased with the use of VMs (question 20 in Annex I) (Figure 26);
- PPQ 3: Share of employees who experience their work quality has increased with the use of VMs (question 21 in Annex I) (Figure 27).

PPQ 3 is a new indicator, which was developed after the revision of the survey questions followed the expert feedback and the pilot survey. PPQ 3 is an important but somewhat difficult to measure and follow up indicator due to the subjective perceptions of what constitutes work quality as well as how the increase in work quality is observed by individual employees and reported in the survey.

Survey results show that 44% of respondents in three studied public authorities perceive that their work productivity has increased with the use of VMs, and 78% feel the same at least to a certain extent (Figure 26). Further discussion on this is provided in section 3.2.1 under organisational efficiency.

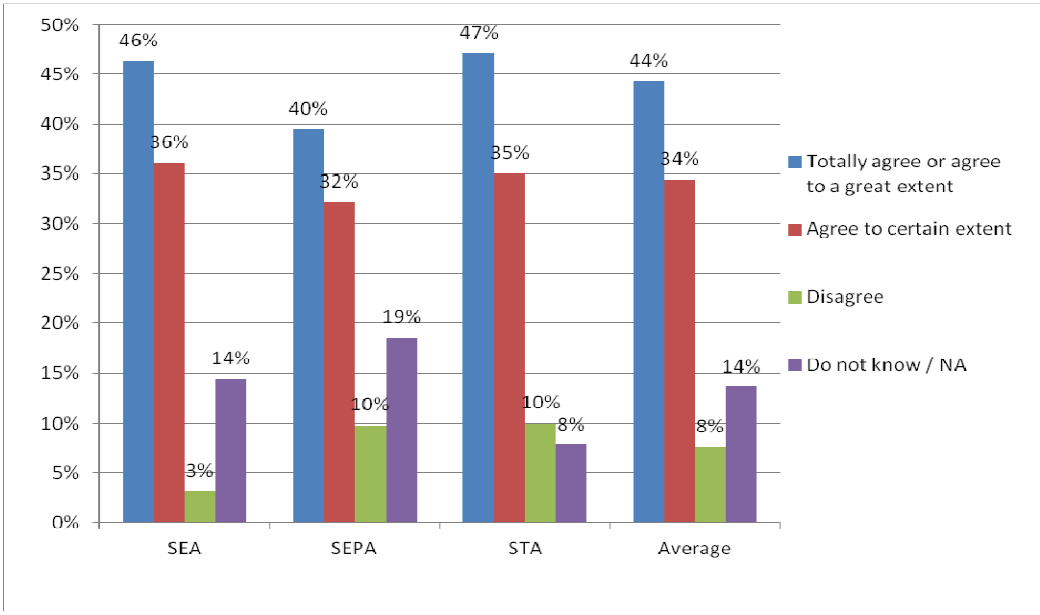

Figure 26. Share of employees who experience their work productivity has increased with the use of VMs

When it concerns work quality, 41% of respondents believe that the use of VMs has allowed them perform a job of higher quality, and 77% think so at least to a certain extent. These figures do not vary very much when comparing three organisations in this the study (Figure 27). Further discussion on this is provided in section 3.2.1 under organisational efficiency.

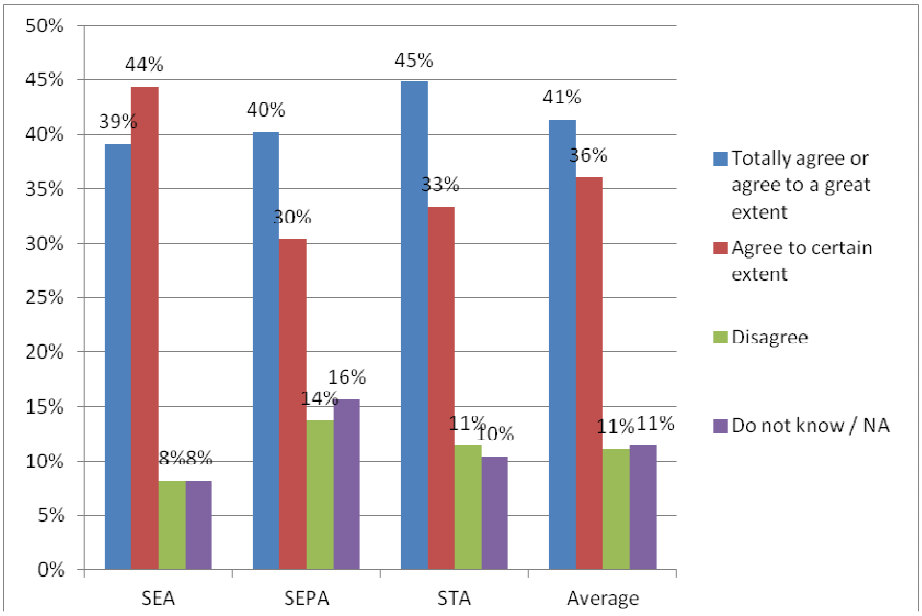

Figure 27. Share of employees who experience their work quality has increased with the use of VMs

3.1.7 Discipline and attention

VMs have been described as more concentrated (Pate Dwyer 2007; Räsänen 2006) and "to the point" than a meeting in person (Pate Dwyer 2007) as well as "efficient and focused" and therefore requiring discipline and attention from the participants (Picha and Räsänen 2011; Räsänen et al. 2010; Räsänen 2006).

During in-depth interviews within this project different perceptions have been reported on the comparison of the respondent's ability to keep attention in a VM and a F2FM. While many felt it was more difficult to keep their focus in VMs, a number of factors seemed to be embedded, and the issue has proven to be not that straightforward. In many cases this ability turned out be context dependent (e.g. if a meeting involves video, if participants seat in their own office, what kind of meeting it is, how important and how long the meeting is, how well-prepared and structured it is etc.).

This survey has therefore sought to deeper evaluate the importance of different factors contributing to the ability of meeting participants to keep their focus and attention in a VM and measured the following indicator:

- DA 2: Factors that contribute to the ability to keep attention in VMs, and the share of employees that consider these factors relevant to their work routines (questions 24, 25 in Annex I) (Figure 28)

The employees in three public authorities were offered to rank the following factors, which were identified from a literature review, in-depth interviews and a pilot questionnaire, according to how much they contribute to keeping meeting participants attentive in a VM:

- Meeting structure;
- Experience of a meeting leader;
- Meeting length;
- Ability to comment in writing (chat);

- Ability to comment orally;
- Presence of participants' images;
- Image quality;
- Sound quality;
- Meeting environment;
- Access to technical support.

Survey respondents had a possibility to also name other factors they consider important in contributing to their focus and attention during a VM.

Figure 28 represents the distribution of responses on this indicator. It can be seen that sound quality, meeting structure and undisturbed working environment are among the most important factors defining the high levels of participant attention in a VM. These are followed by the experience of a meeting leader, ability to comment orally, access to technical support from the very beginning and descent image quality. Factors such as the presence of participants' images, ability to comment in writing and sitting in the same room with colleagues are considered less important by the respondents.

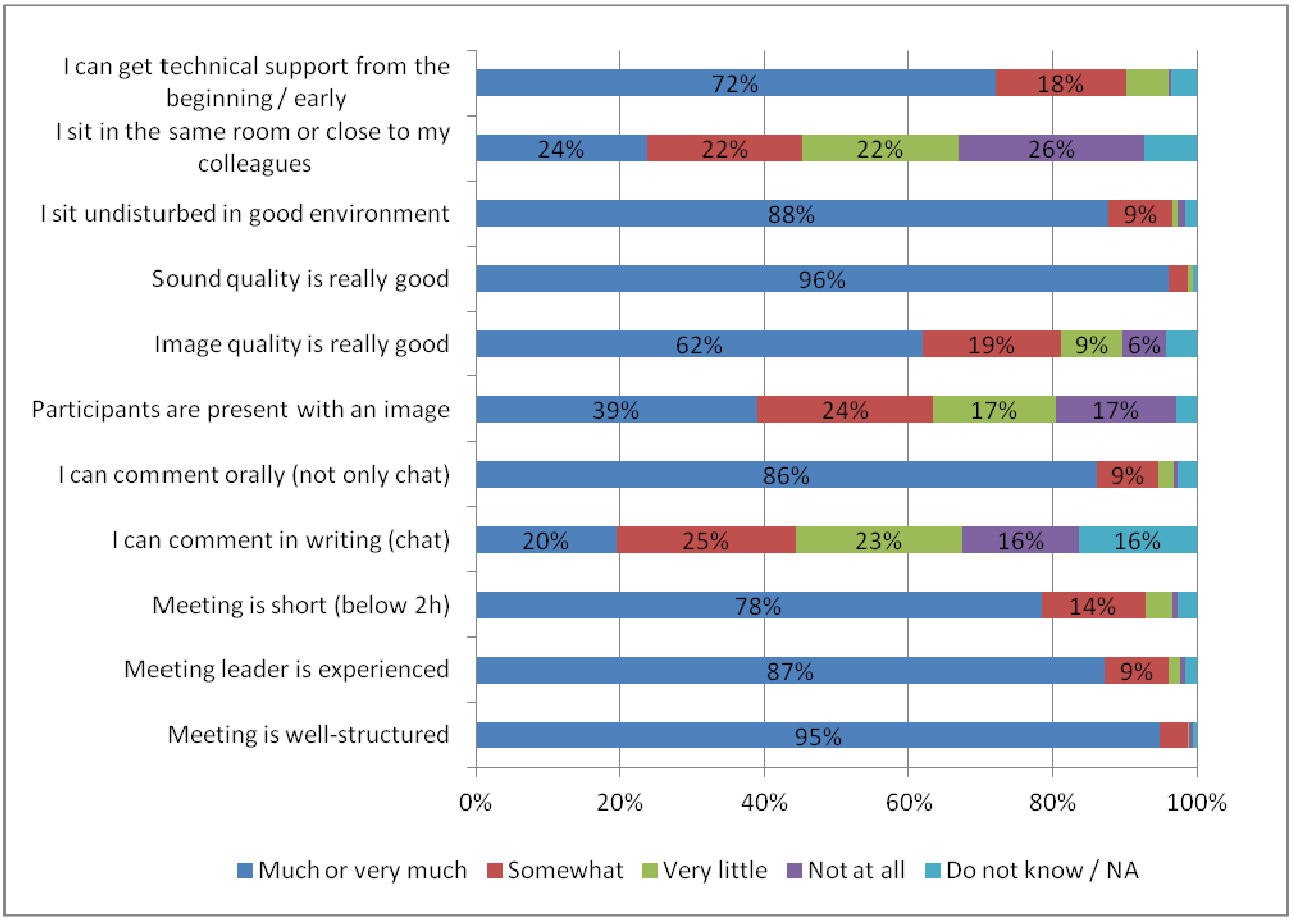

Figure 28. Factors that contribute to the ability to keep attention in VMs, and the share of employees that consider these factors relevant to their work routines

3.1.8 Age

Age has been included in the analysis as some interview respondents referred to the potential correlation between VM use and the age (e.g. younger generation is less afraid of technology, is more

interested and capable to use VMs etc.). Responses during in-depth interviews have been, however, contradictory as some interviewees considered the rates of VM adoption and use to be individual and not age-dependent. On the other hand, many interview respondents consider that young families with children may be more interested in VMs use due to a potential for higher work flexibility.

The survey sought to reveal whether there was any age dependency in the rate of VM use and collected the data on the following indicator:

- AG 1: Distribution between different age groups and the rate of virtual meeting use in three studied organisations (questions 2, 12 in Annex I) (Figure 29-Figure 31).

While it is quite difficult to observe any distinct pattern or correlation between the age and the rate of VM use before additional statistical tests have been carried out, it can still be noticed that the low rates of video-conference use (from no use at all to 1-5 times per year) are observed in the older age groups (over 50 years old) (Figure 30). For web-conferences such low use rates are more equally distributed between respondents in the age group between 30 and 59 (Figure 31). When comparing frequent uses of VM forms (i.e. from everyday to several times per day), audio- and web-conferences are more likely to be chosen in all age groups than video-conferences (Figure 29-Figure 31).

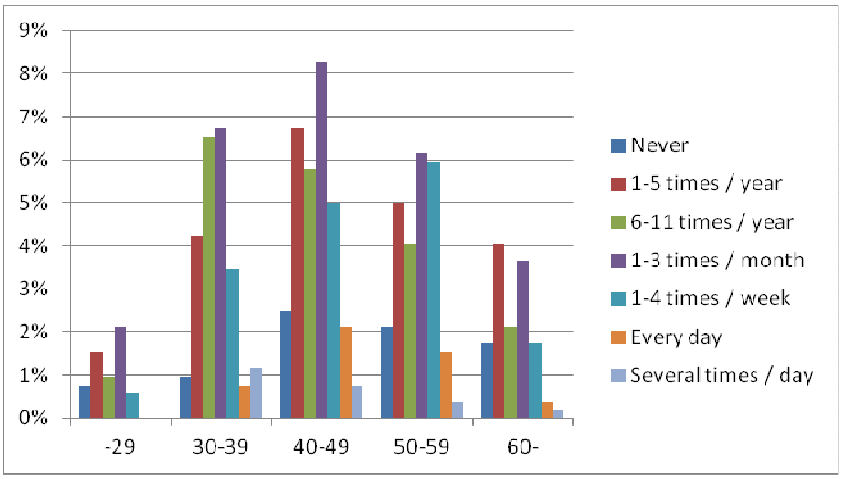

Figure 29. Distribution between different age groups and the rate of audio-conference use in three studied organisations

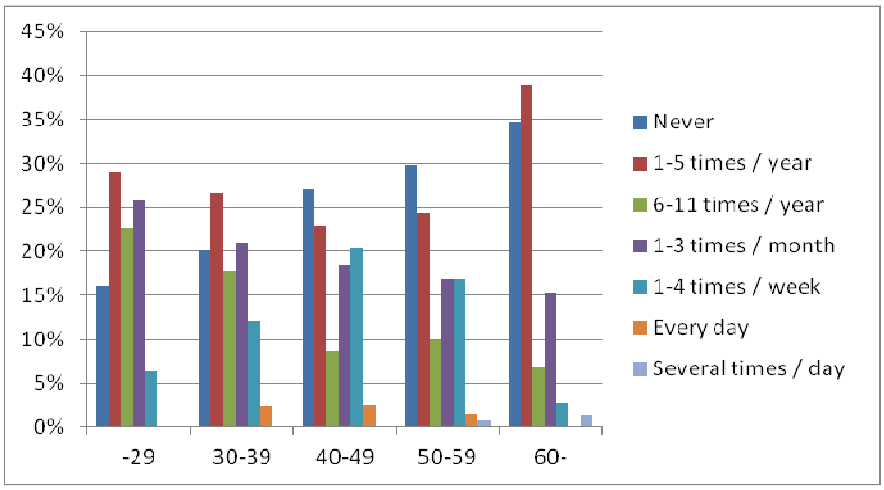

Figure 30. Distribution between different age groups and the rate of video-conference use in three studied organisations

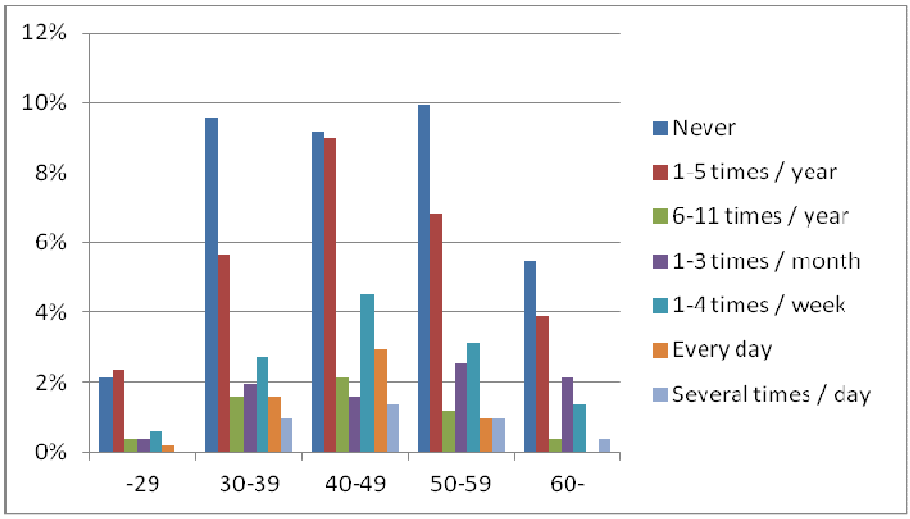

Figure 31. Distribution between different age groups and the rate of web-conference use in three studied organisations

3.1.9 Meaning and significance

The question during in-depth interviews with employees at Swedish public authorities has been posed to VM users whether they perceived VMs as more or less important compared to F2FMs. Some did not perceive any difference in this sense, and agreed that the significance of a meeting rather depended on its topic and content than the media used. Others perceived F2FMs as more important due to the time and resources spent to hold a meeting.

Research carried out by Telia in 2003 shows that Telia employees perceived VMs as "second class meetings" that were "less significant" while F2FMs were referred to as of "higher interest, seriousness and respect" (Arnfalk and Kogg 2003). No such perceptions were observed during in-depth interviews within this study, which had been, however, carried out nine years later in a different context of VM technology development and in a public sector (as opposed to business sector).

The survey sought to confirm or reject the hypothesis that VMs were perceived as less serious and were used to handle less important topics. The following indicators have been therefore evaluated in the survey:

- MS 1: Share of employees experiencing that VMs are used to handle less important or serious topics (questions 15, 16 in Annex I) (Figure 32, Figure 33);

- MS 2: Share of employees believing that the choice of some meeting forms over others indicates that the meeting is of less importance (questions 15, 16 in Annex I) (Figure 34).

Survey results show that in three studied organisations 97% of respondents believe that VMs are used to handle less important questions as compared to F2FMs with 69% of this figure allocated to audio-conferences (Figure 32). At the same time 63% of respondents feel that F2FMs are in general more serious than VMs, while among different forms of VMs video-conferences are perceived as the most serious (24% of total responses or 68% of all VMs) (Fig. 3.29). Video-conferences were ranked somewhat higher in terms of their seriousness in SEA (29%) and SEPA (35%) as opposed to STA (9%) (Figure 33). Ninety five percent of respondents believe that the choice of a VM over a F2FM indicates that a meeting is of less importance (64% of responses in this case are again related to audio-conferences) (Figure 34).

However, a precaution should be taken when analysing survey data on MS 1 and MS 2 as the percentages in Figure 32-Figure 34 are calculated only from those respondents who provided their opinion on the question. On average in three studied organisations 28% of respondents have indicated that the question either was not relevant to them or that they did not know any answer to it. This figure varied from 10% of no opinion for F2FMs, to 24% for audio-conferences, 35% for video-conferences and 42% for web-conferences on average between the three studied organisations. At the same time the (absence of) response was often supported by a qualitative comment with reflections on the question formulation and/or additional things to consider. It turned out that the results on MS 1 and MS 2 were not that straightforward as shown in Figure 32-Figure 34. Further discussion on this will be taken up in the next chapter (see Section 4.1.9).

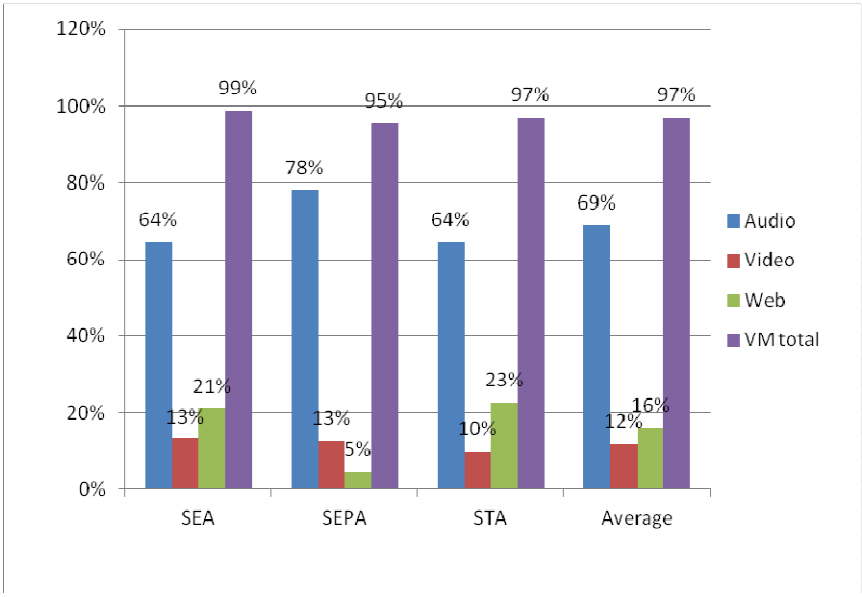

Figure 32. Share of employees experiencing that VMs are used to handle less important questions

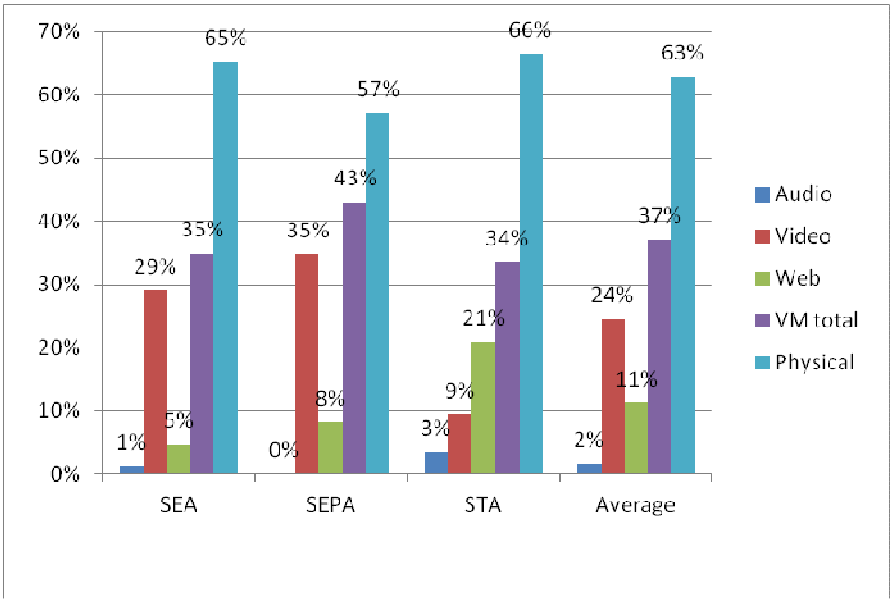

Figure 33. Share of employees experiencing that specific meeting forms are more serious than others

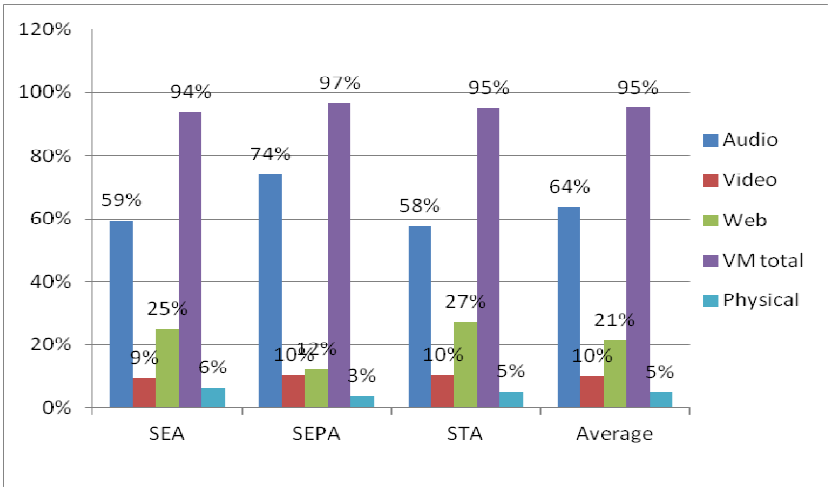

Figure 34. Share of employees believing that the choice of some meeting forms over others indicates that the meeting is of less importance

3.2 Virtual meetings and organisations

As described in section 2.1.2, categories for organisational effects of VMs include organisational structure, efficiency, staff and sustainability requirements. In the survey the results of which are discussed in this report a focus has been made on the efficiency and staff areas, where it was deemed as the most feasible to put relevant questions to a large number of individual respondents.

There is no doubt that the increased use of VMs will affect the organisation's geographical and logical structure, i.e. how organisation's activities, responsibilities and projects are organised and managed (Lindeblad 2012). VMs enable the development of virtual teams as opposed to physical teams (Townsend, DeMarie, and Hendrickson 1998; Guo, D'Ambra, and Zhang 2009). There are examples of organisations in this study showing that many activities can be organised based on the assumption that VMs are implemented and functional. One possible scenario is to place related operative activities within the same logical department but spread it out in different geographical locations. Another possible scenario is to organise temporary activities, such as projects, in a way that both the needed internal and external resources are available regardless of their physical location. A third scenario is to benefit from a geographical dispersion enabled by VMs to let some activities "go with the sun" and stay operational all day through handovers between co-workers in different time zones.

Results from this study show that VMs can be perceived as a great challenge in some organisations. Specifically it is a challenge for managers and people in leading positions. In a geographically spread organisation or an organisation that has similar activities in many time zones it is more difficult to work with controlling and following up the employees. It is also more difficult to handle issues like conflicts, secrecy, security, employee development and other matters of more personal nature.

As discussed in sections 2.3.2 and 2.3.3, the survey covered three Swedish public organisations including SEA, SEPA and STA. To be able to deeper interpret the results in the organisational areas in each public authority under the study the reader is referred to the key facts about these organisations presented in section 2.3.3.

Overall the main survey resulted into 113 responses from SEA employees, whereof 40% were experienced and 45% were high frequency users of VMs. Half of the respondents from SEA used web-conferencing and 72% used video-conferencing for over six months. Considering the wide variety of

technical solutions implemented and their wide-spread use, SEA is considered to be a mature organisation in its utilisation of VMs (Lindeblad 2012). From SEPA 241 responses were collected, whereof 56% were experienced and 66% were high frequency users of VMs. Of SEPA respondents 35% used web-conferencing and 82% used video-conferencing for over six months. From STA 222 respondents participated in the survey, whereof 55% are experienced and 87% are high frequency users of VMs.

3.2.1 Efficiency

In the original framework selected for this study, organisational efficiency covers a wide area of expected effects, from changes in the ways of working, meeting culture, time aspects to purely economic effects. One of the most important issues to explore is how VMs affect the organisation's productivity. The relationship between efficiency and productivity is complicated and these concepts are often confused, especially in Sweden, where - to make things even more complicated - the same word is used for efficiency and effectiveness. Generally speaking, efficiency is about doing the things right, i.e. use available resources optimally, and productivity is about doing the right things, i.e. produce as much value as possible per unit of resource input.

Productivity is an important factor in the work with VMs. It might not be possible to find any of the direct effects on the environment that the Swedish government is hoping for, for instance by decreased travelling, but if it is possible to show that productivity levels are increasing more than consumption of natural resources, such as energy use and emissions, there is still a lot to be gained.

In the survey the question was asked whether the respondent thought that his/her work productivity had increased due to the use of VMs. Out of the 493 respondents who answered this question, 44% agreed fully or to a large extent with this. If the respondents who agreed to some extent are included, the total share on this parameter will be 78% (Figure 35). For respondents in leading positions (N=168) these figures are higher: 55% agree fully or to a large extent and 85% agree fully or to some extent (Figure 35). For high frequency (N=383) and experienced (N=289) users these figures are slightly but not significantly higher (Figure 36).

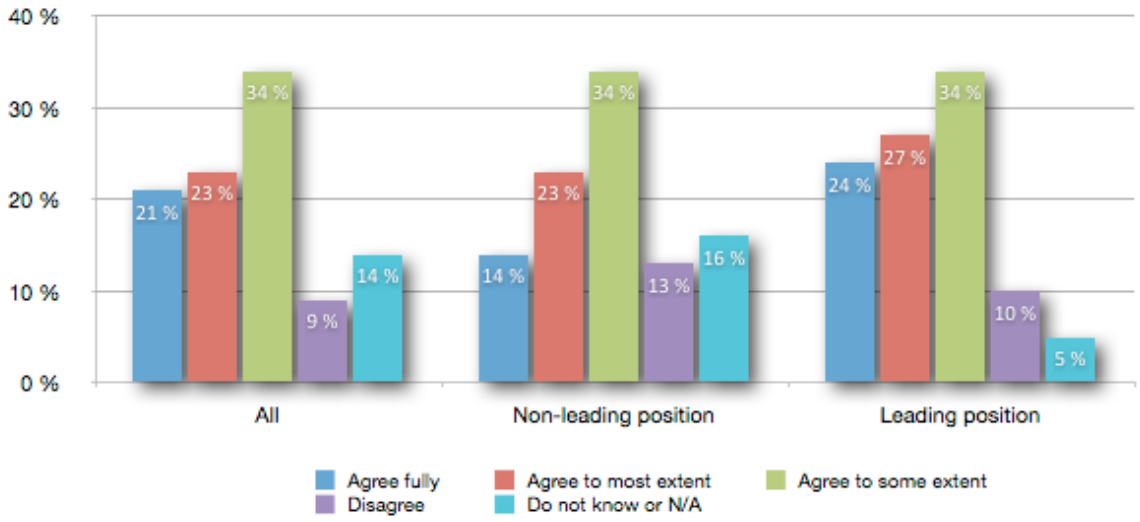

Figure 35. Share of employees experiencing that their productivity has increased with the use of VMs

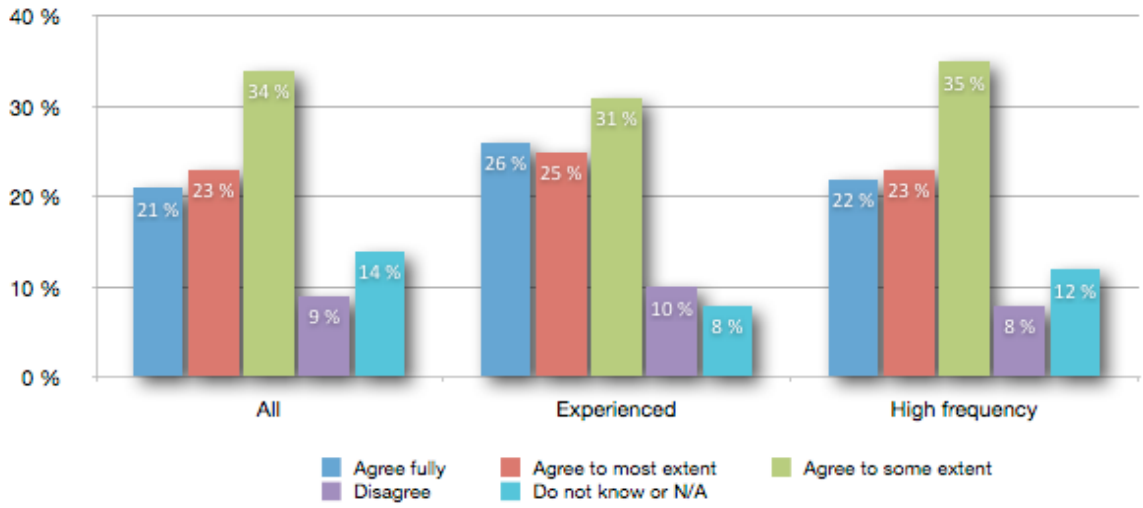

Figure 36. Share of employees experiencing that their productivity has been increased due to the use of VMs (by use experience and frequency)

For respondents from SEA who have answered the question about their work productivity (N=95), 46% agree fully or to most extent with the suggestion that their work productivity has increased since they started using VMs, 82% agree fully or to some extent, and only 3% disagree (Figure 37). The equivalent numbers for STA (N=191) are as follows: 48% agree fully or to most extent, 83% agree fully or to some extent and 10% disagree with the statement. For SEPA (N=203), 40% agree fully or to some extent, 72% agree fully or to some extent and 10% disagree.

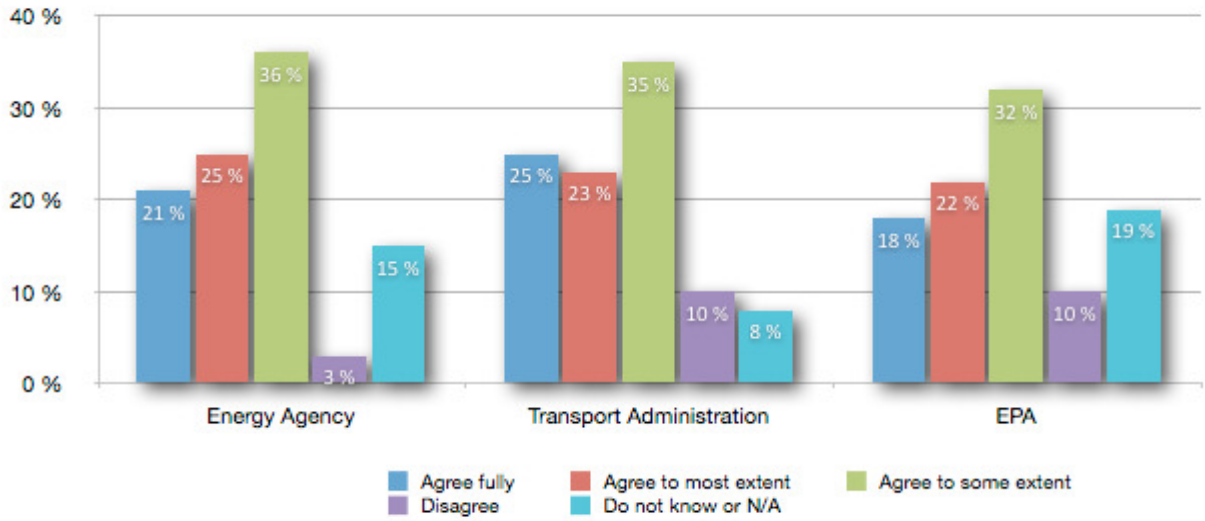

Figure 37. Share of employees experiencing that their productivity has increased with the use of VMs (by organisation)

In summary, for the four productivity related indicators described in section 2.2.2, these are the figures that have been reported:

- PPQ1: Share of employees who think their work productivity has increased with the use of VMs. In this survey the average is 78%.
    - PPQ1 for SEA is 82%
    - PPQ1 for STA is 83%
    - PPQ1 for SEPA is 72%
- PPQ1L: Share of employees in leading positions who think their work productivity has increased with the use of VMs. In this survey the average is 85%.
- PPQ1F: Share of high frequency users who think their work productivity has increased with the use of VMs In this survey the average is 80%.
- PPQ1E: Share of experienced users who think their work productivity has increased with the use of VMs. In this survey the average is 82%.

The view that VMs have a potential to mainly positively affect productivity was confirmed during in-depth interviews, which were part of the project. There were no interviewees who completely disagreed on this matter. However, most interviewees took a hypothetical stand on the subject speculating that there should be a positive effect and that is would be very interesting to measure and follow up, although few organisations are actually doing this.

The second efficiency related question that was put in this survey concerns the respondents' perception of VM's influence over his or her possibilities to do a better job, i.e. a job of higher quality. Out of all respondents who answered this question (N=493) 18% agreed fully, 24% agreed to most extent and 34% agreed to some extent, totalling 76% who agreed fully or to some extent. 12% of the respondents disagreed and another 12% were not certain. Also here, there is a difference between respondents in leading and non-leading positions, where the total of respondents in leading positions (N=169) who agreed fully or to some extent was 85%. The level of uncertainty with respondents in leading positions is also lower (5%) (Figure 38).

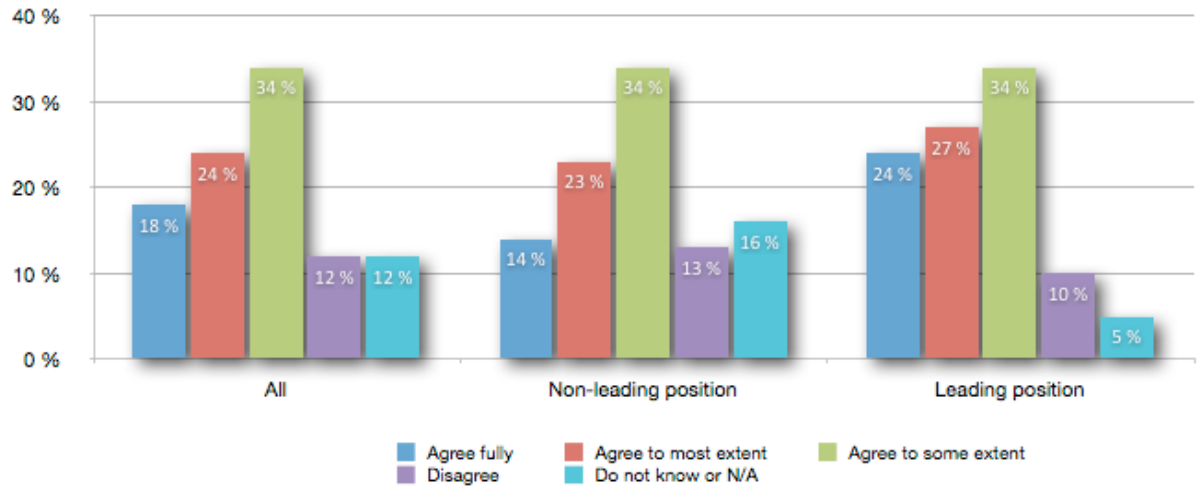

Figure 38. Share of employees experiencing that their work quality has increased with the use of VMs

Also in this case, the figures for experienced (N=290) and high frequency users (N=384) are slightly higher, 80% agree fully or to some extent, but the difference is not significant (Figure 39).

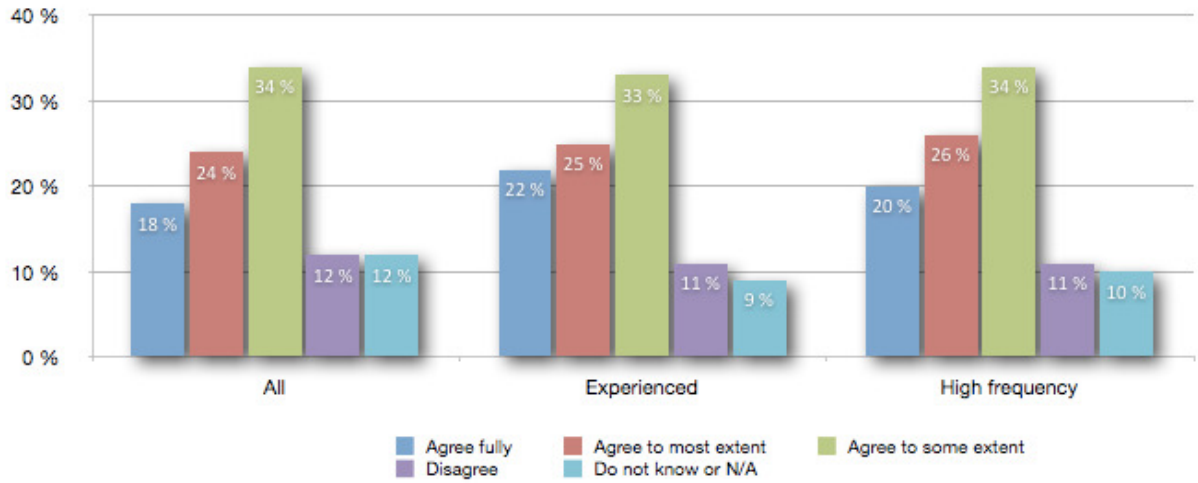

Figure 39. Share of employees experiencing that their work quality has increased with the use of VMs (by user experience and frequency)

For respondents from SEA who have answered the question about quality (N=95), 40% agreed fully or to most extent with the suggestion that the use of VMs helps to do a better job, 83% agreed fully or to some extent, and 8% disagreed. The equivalent numbers for STA (N=192) are 45% agreeing fully or to most extent, 78% agreeing fully or to some extent and 11% disagreeing. For SEPA (N=203), 40% agreed fully or to some extent, 70% agreed fully or to some extent, and 14% disagreed (Figure 40).

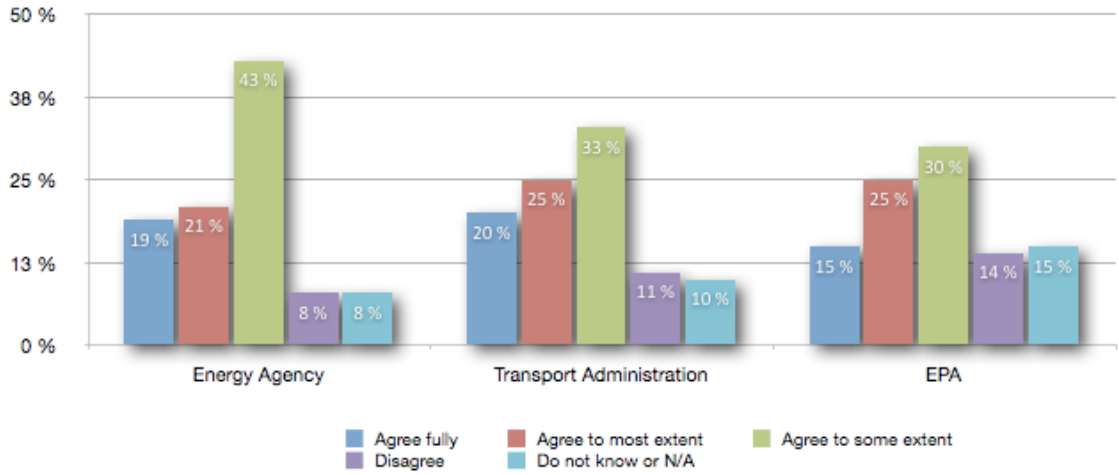

Figure 40. Share of employees experiencing that their work quality has increased with the use of VMs (by organisation)

In summary, for the four job quality related indicators described in section 2.2.2, these are the figures that have been reported:

- PPQ3: Share of employees who experience their work quality has increased with the use of VMs. In this survey the average is 76%.
    - PPQ3 for SEA is 83%
    - PPQ3 for STA is 78%
    - PPQ3 for SEPA is 70%

- PPQ3L: Share of employees in leading positions who experience their work quality has increased with the use of VMs. In this survey the average is 85%.
- PPQ3F: Share of high frequency users who experience their work quality has increased with the use of VMs. In this survey the average is 80%.
- PPQ3E: Share of experienced users who experience their work quality has increased with the use of VMs. In this survey the average is 80%.

3.2.2 Staff

Considering the initial framework on the effects of VMs on society, organisations and individuals, which was selected for this study (see section 2.1), there is a reason to assume that VMs will have an effect on staff in a number of areas, the key two of which include staff turnover and capability to recruit. Two related questions in the survey seek to measure these effects. The first question relates to the staff turnover and the respondents were asked if they thought VMs contributed to the increased staff retention, primarily through increased possibilities to work more flexibly. The second question sought to find out whether use of VMs could increase the organisation's capabilities to attract new employees.

From all respondents who answered the first question (N=489), 16% agreed fully with the fact that VMs contributed to the increased staff retention, 18% agreed to most extent and another 34% agreed to some extent, totalling a 68% who agreed fully or to some extent. 13% disagreed and another 19% were uncertain. Again, respondents in leading position (N=166) were relatively more positive. In this group a total of 76% agreed fully or to some extent (Figure 41).

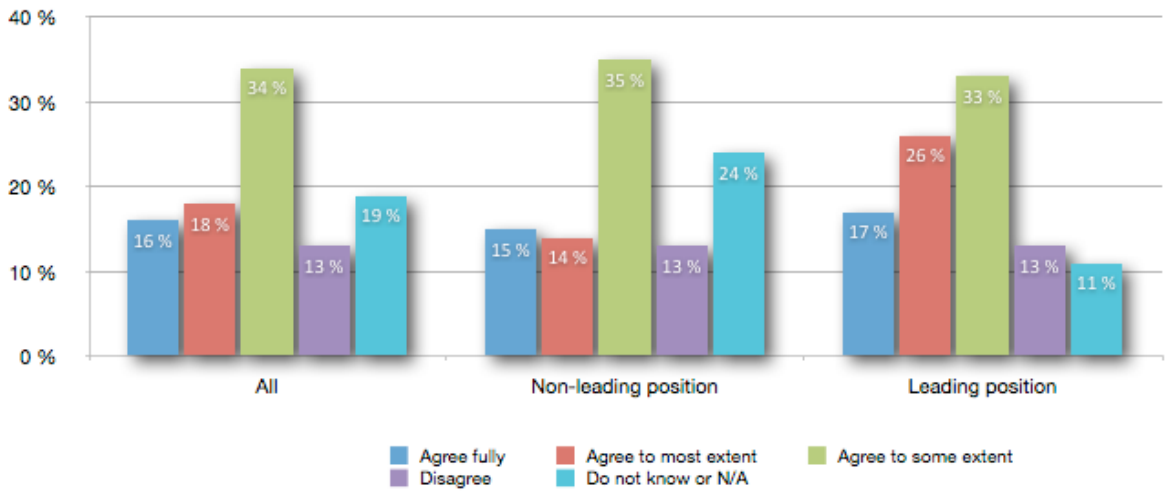

Figure 41. Share of employees who think that use of VMs can increase staff retention

Between the three organisations in the study there are some differences with regards to how the respondents perceive the influence of VMs on the staff turnover. The respondents in SEA (N=95) are most positive, 77% agree fully or to some extent and 12% disagree. In STA (N=189), 67% agree fully or to some extent, whereas 17% disagree. In SEPA (N=201), 64% agree fully or to some extent and 9% disagree. SEPA has a significantly higher share of uncertain respondents, 27% compared with 12% and 15% in SEA and STA respectively (Figure 42).

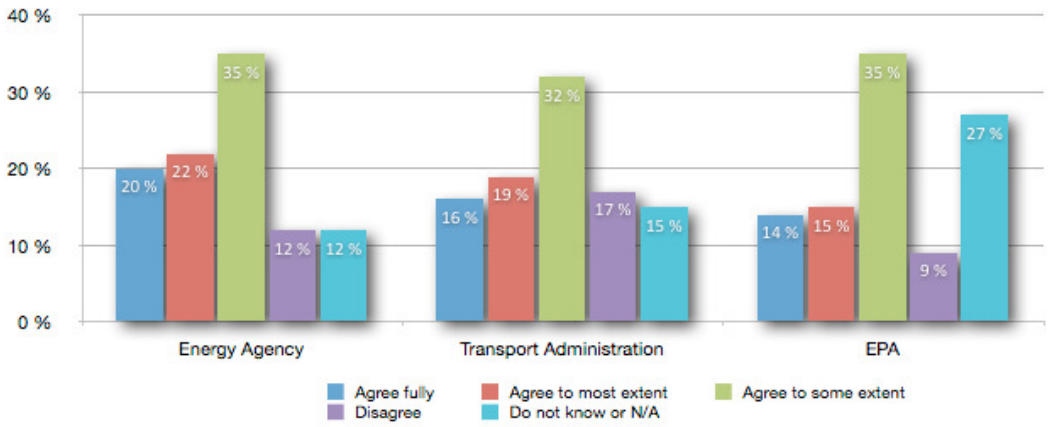

Figure 42. Share of employees who think that use of VMs can increase staff retention (by organisation)

In summary, for the staff turnover related indicators defined in this survey, this is the result:

- STO1: Share of employees who think that VMs contribute to a decrease in a staff turnover. In this survey the average is 68%.
    - STO1 for SEA is 77%
    - STO1 for STA is 67%
    - STO1 for SEPA is 64%
- STO1L: Share of employees in leading positions who think that VMs contribute to a decrease in staff turnover. In this survey the average is 76%.

The second question in the area of staff that was put forward in this survey is related to the organisation's attractiveness, which in turn affects the organisation's capability to recruit and retain its staff. The statement in the survey was formulated as follows: "By increasing work flexibility through VMs our organisation can become more attractive as an employer". Among all respondents that answered this question (N=488), 24% agree fully with this statement, 25% agree to most extent and another 34% agree to some extent, totalling 83% who agree fully or to some extent; 8% disagree and another 10% are uncertain. Again the respondents in leading position (N=167) are slightly more positive, 86% of whom agree fully or to some extent (Figure 43).

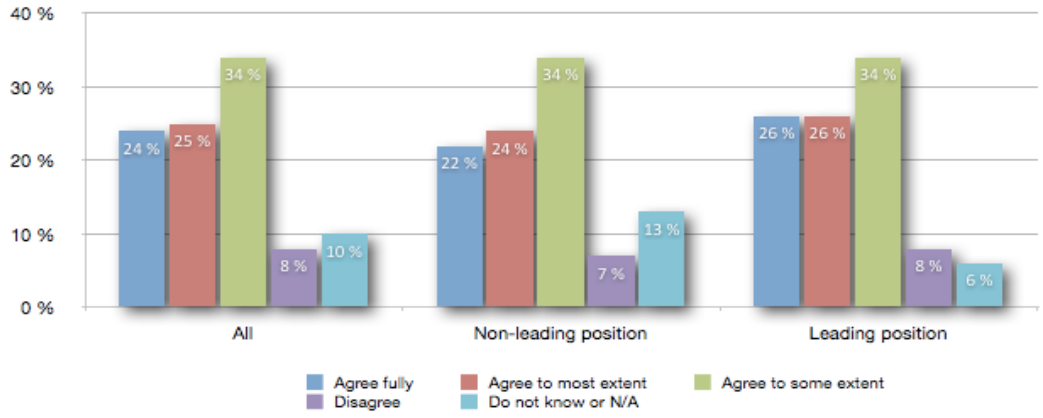

Figure 43. Share of employees who think that use of VMs can improve the attractiveness of the organisation as an employer

There is a slight difference between the three organisations in the study when it comes to the view on attractiveness. Again it is SEA (N=93) that is the most positive, in which 90% of respondents agree fully or to some extent that VMs will make their organisation more attractive as an employer, whereof 29% agree fully; 8% disagree and only 2% are uncertain. In STA (N=191) 80% agree fully or to some extent and 10% disagree. Finally, in SEPA (N=201), 80% of respondents agree fully or to some extent, only 5% disagree but 14% are uncertain (Figure 44).

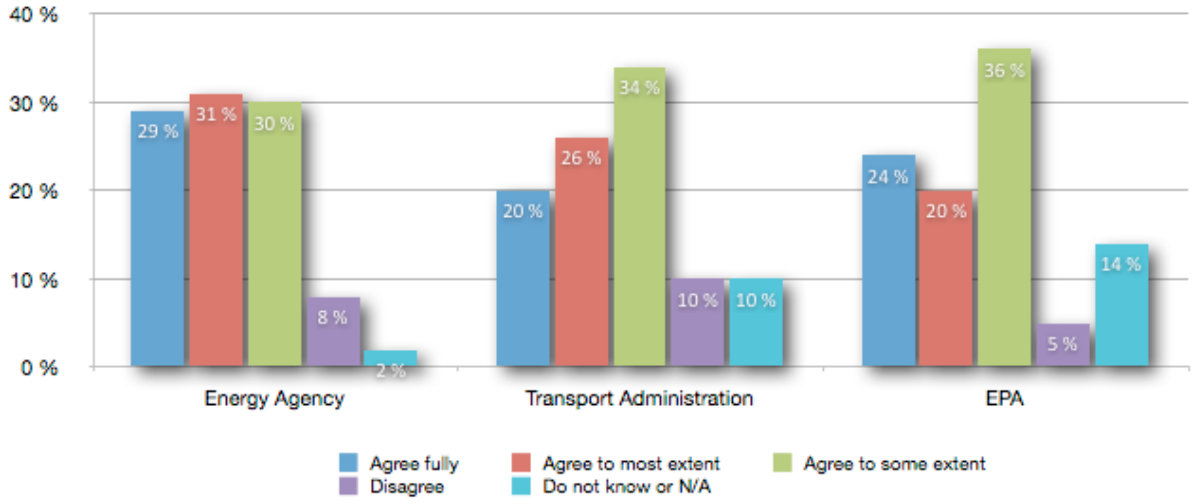

Figure 44. Share of employees who think that use of VMs can improve the attractiveness of their organisation as an employer (by organisation)

To sum up, the indicators selected for measuring attractiveness found in this survey are:

- SOA1: Share of employees who think that VMs make their organisation more attractive as an employer. The average here is 83%
    - SOA1 for SEA is 90%
    - SOA1 for STA is 80%
    - SOA1 for SEPA is 80%
- SOA1L: Share of employees in leading positions who think that VMs make their organisation more attractive as an employer. The average is 86%.

4 Analysis and discussion

This chapter analysis and discussed results from the survey on VM effects on organisation and its employees in Swedish public authorities, which were presented in chapter 3. The analysis and discussion is structured in line with the indicator categories presented in section 2.1.

4.1 Virtual meetings and individuals

4.1.1 Negative stress and handling of virtual meeting equipment

This study shows that VMs reduce stress at least to a certain extent for 77% of respondents in three studied organisations. Largely the reasons for this are similar to the ones identified in the literature and in-depth interviews. Business travelling is recognised to always be connected with a certain level of stress and avoiding it results into stress avoidance/reduction. Examples of stress contributing factors identified by the respondents of this survey include travel preparations (e.g. purchasing tickets, booking a hotel, packing etc.), trip related hassles (e.g. searching for the destination point or a place to eat in a new city, cancelled or delayed trains and airplanes, a need to comply with a strict schedule and arrive at a certain time etc.) and post-travel activities (e.g. preparation of financial reports on the journey, sorting out accumulated work in the home office and private errands etc.). Moreover travelling makes people more tired due to, for example, little sleep, early start and late end of a working day, which in turn contributes to increased stress levels. Besides, negative stress can be caused by being away from home and not being able to comply with family responsibilities or a need to make rearrangements in a private life (e.g. organise a baby sitter, adjust to the kindergarten opening hours, rebook leisure activities etc.).

At the same time, 16% of respondents in three studied organisations disagree that VMs reduce their stress. Occasions when VMs can increase personal negative stress include a risk by an employee to book too many meetings or other tasks in a row since the employee remains physically present in the home office. This might result into too little time to reflect upon the VM and finalise the work linked to this meeting, which in turn may pose negative stress on the employee. In addition, such an intensive schedule jeopardises the preparation to a VM, which could otherwise be done in a more focused and consistent way should an employee have had certain time allocated specifically for travelling and the meeting. VMs are also sometimes viewed as contributing to the fragmentation of a working day when on the contrary during a business trip an employee has a better chance to solely focus on one working item. In addition, the time during a business trip can be used for relaxation and rest, which may help to reduce stress.

Another important factor contributing to the increased stress levels from VM use identified both by the respondents to this survey and in the earlier research by the authors is related to the handling of VM equipment. In three studied organisations 54% felt at least to a certain extent unsure about handling VM equipment and/or experienced a risk that the meeting would not work out without technical problems. This figure is somewhat lower for audio-conferences (40%) than for video-conferences (63%) and web-conferences (59%), which can be explained by a simpler technology used in audio-conferences (a telephone) as well as a longer history of its use compared to other VM types.

Some respondents in Swedish EPA find it stressful to ensure that web-conferences work out technically and have little knowledge about this type of meetings, which is likely to be linked to a low rate of the webinar use in the organisation (45% of respondents have never used this technology in their work routines). On the other hand, video-conference technology is more mature in the EPA (98% of respondents use those) and is generally perceived as easier to manage. However, the remarks are made that technical support is crucial for video-conferences to function without technical problems, particularly if such meetings involve more than two participants.

In their VM solutions for the time period when this survey was performed, Swedish Transport Administration has just changed from using LiveMeeting to Lync, and has eliminated the use of video-conferences completely (41% of respondents have never used video-conferences in their work routines). Therefore the responses are often linked to the transition to a new web-conference solution, which has put many experienced users in the shoes of beginners. Some respondents report that there are seldom problems with web-conferences, and if such arise, they are solved relatively easily while others wish for a better technology performance. If the meeting involves many participants, there is a higher risk that at least one of them has technical problems, which results in time losses to solve the problem. At the same time, only 14% in Swedish Transport Administration feel unsure about using web-conferences (compared to 47% in Swedish Energy Agency and 39% in Swedish EPA), which speaks about the relative maturity of web-conference technology in the organisation and makes it a good case for others to learn from.

When it comes to Swedish Energy Agency, there is a trend for more negative comments and uncertainties among VM users as compared to two other studied organisations. Occasional technical problems are reported, and there is a higher degree of uncertainty when it concerns specific applications of VMs (e.g. applicable number of external participants for a VM, requirements for their participation, feasibility of audio-conferences with a new telephone operator etc.). While technical problems with VMs do not necessarily result into an increase of stress levels among employees, overcoming them could actually make VMs use in the organisation more widespread. For example, one simple way is to place clear instructions in the conference rooms for VMs, the need for which has been highlighted by the respondents from Swedish EPA and Energy Agency.

4.1.2 Work/leisure time, life quality and travel preferences

In the three studied organisations VMs save working time at least to a certain extent for 92% of respondents. While there is often a possibility to work while travelling, respondents indicate that much of the working time is still lost due to the travelling hassles (e.g. changes of transportation means, interruptions in the network connection on the train etc.). Situations when VMs might not contribute to working time savings include their potential to generate more meetings and therefore fill up the vacant time slots of the employees. The later problem was taken up by four respondents from the Transport Administration. Sometimes the question about working time savings appeared irrelevant to the EPA employees since VMs rather save time for those, who would otherwise travel to meet them.

Other reasons why VMs might not contribute to working time savings is that travelling occurs during the private time of the employees (e.g. on the weekends, early mornings or late evenings). The survey shows that VMs save private time at least to a certain extent for 86% of respondents in the three studied organisations. In this sense a substitution of F2FMs with VMs allows the employees to enhance their work-life balance by, for example, sleeping longer in the morning, avoiding arriving home later than usual, spending Sunday evenings with their families, pursuing leisure time activities scheduled right after the regular working hours etc. There is also a chance that more concentrated working time without time spent on travelling results into more leisure time.

The offices of Swedish Transport Administration are spread in seven different locations around the country as opposed to two locations for Swedish EPA (Stockholm and Östersund) and Swedish Energy Agency (Stockholm and Eskilstuna). This might explain a higher travelling frequency among employees of Swedish Transport Administration, where 59% of respondents to the survey travel at least once per month while this figure is 50% for the Energy Agency and only 16% for the EPA. Hence the desire to reduce their business trips is higher among the employees of the Transport Administration (26% indicate they would like to do so) as compared to the Energy Agency (12%) and the EPA (15%). At the same time 61% of respondents in each of the authorities that travel more seldom in general (i.e. EPA

and Energy Agency) find travelling stimulating and enriching as opposed to a somewhat lower number of 49% at the Transport Administration.

A general pattern observed when analysing qualitative comments of the survey respondents is a preference to take fewer but longer trips instead of many one day trips. This is often connected to the maintaining of a work-life balance and arranging family and other private issues during the employee's absence from home. In three studied organisations 57% of respondents find business travelling stimulating and enriching both for work and personal development, enjoy experiencing new environments and meeting people. However, many seek to keep the frequency and length of their trips in a balance with their private lives and at a "just right" level.

Another important notion that appears in the comments to the survey is that economic compensation for business trips is perceived as being too low to make them attractive. This is something to consider, should an organisation seek to further discourage business travelling and promote VMs instead. In this case, it would be preferable to keep economic benefits of business travelling as low as possible.

On average 14% of respondents in three studied organizations find business travelling to be an indication of (high) status. This is a much lower figure compared to the one derived from a study at Telia Research AB, where 50% of employees considered business travel as an indication of social status (Arnfalk and Kogg 2003). Such a difference can be linked to a number of factors: 1) rapid development of ICT solutions within the last 10 years, which has improved the image of VMs and convenience of their use; 2) potential difference in perceptions on travelling between private and public sector when status is tentatively a more meaningful attribute in business; 3) types of trips performed in a large telecom company compared to Swedish public authorities (the later conduct mainly short trips within Sweden).

4.1.3 Social interaction

Most of qualitative comments by the respondents in the survey have confirmed earlier findings from in-depth interviews and literature on social interaction issues linked with VMs. In general, F2FMs are confirmed to provide their participants with more diverse communication possibilities (e.g. body language use, informal chats in coffee breaks, access to spontaneous information etc.), are perceived as more applicable when people meet for the first time or for a start up meeting in a project (e.g. with a new working group). It is also perceived that (creative) discussions (including those about more difficult questions) are more effective when all meeting participants are physically present in the same room and that F2FMs provide a better engagement in discussions between the participants as compared to VMs. Another advantage of F2FMs identified by the survey respondents is a possibility to meet in person with those people whom otherwise one would never have met. F2FMs are perceived as more suitable for study visits or inspections as well as for longer meetings. A rule of a thumb mentioned by the survey respondents, which largely confirms the findings from the literature, is that for their best effectiveness audio-conferences should be held under two hours, video-conferences – not longer than a half of a day, and F2FMs should be used for the meetings lasting one day or longer.

In general, 72% of respondents in three public authorities find F2FMs more fun and stimulating than any form of VMs. Among different types of VMs the preference on this evaluation criterion is given to video-conferences in the Energy Agency and the EPA (21% and 25% correspondingly) and to web-conferences in Transport Administration (11%). The reasons for such responses are evident considering the rates of video-conference vs. web-conference use among three studied authorities. In Swedish Transport Administration 60% of respondents never use video-conferences in their work while 81% do use web-conferences. At the same time, 34% of respondents in the Energy Agency and

53% of respondents in the EPA never use web-conferences in their work, while 92% and 95% respectively use video-conferences.

Only 2% of the respondents find audio-conferences more fun and stimulating than other meeting forms. Such results are logical considering the low media richness of audio-conferences (e.g. limited possibilities for image transfers, high dependency on sound quality etc.). Several respondents commented in the survey that they choose a meeting form depending not on how fun or stimulating it is but rather on the purpose of the meeting and for other practical reasons (e.g. in which locations their meeting partners are seated).

4.1.4 Career and recruiting

Overall half of all respondents in three studied public authorities believe that VMs use can increase the attractiveness of their organisation as a workplace, and 83% think that VMs can do so at least to a certain extent. These figures for each studied authority are respectively 60% and 89% for the Energy Agency, 45% and 81% for the EPA, and 47% and 81% for Transport Administration. What really makes a workplace more attractive according to the survey respondents is the possibility to work from home. This seems to be particularly relevant for the Energy Agency with its employees commuting between the offices in Stockholm and Eskilstuna. This might also explain the fact that respondents from the Energy Agency allocate a somewhat higher importance to the presence of VMs for the attractiveness of the organisation compared to two other authorities in this study.

Many respondents in their comments point out that although the use of VMs in an organisation might contribute to its attractiveness as a workplace, they doubt it is the main factor when it comes to the employment process. In addition, a possibility to work distantly becomes more and more established in a Swedish society, which makes it rather a precondition for the work routines in a modern organisation than the organisation's completive advantage on a job market.

The other side of the coin is also evident, and can explain why a number of respondents are somewhat critical to this potential VM advantage. For example, travelling possibilities at the workplace may be perceived as an attractive advantage by many while an opportunity to work/meet distantly would be rather relevant for societal groups in the need for more flexibility at work (e.g. the ones who have family and/or kids). Moreover, the perception that F2FMs are important for the work excellence and personal well-being still remains, and VMs might therefore not always be that attractive. Another factor mentioned by the survey respondents is that job applicants need to be aware both of the advantages and disadvantages of having access to VM technology at work in order to make reasonable judgments on how attractive the employer organisation is.

F2FMs are preferred over VMs when it concerns the employment process. In three studied organisations 72% of respondents believe that F2FMs are more applicable than VMs for the parts of the employment process with this figure varying from 64% in Energy Agency, 71% in EPA to 80% in Transport Administration. This also confirms earlier findings from in-depth interviews that F2FMs are more applicable to job interviews than VMs due to the higher media richness.

When it concerns the use of specific VM forms for parts of employment process, respondents from Energy Agency and the EPA prefer video-conferences while those at Transport Administration would rather choose web-conferences. In Swedish Transport Administration 60% of respondents never use video-conferences in their work routines while 81% do use web-conferences, which explains why Transport Administration prefers also web-conferences over video-conferences in the employment process. At the same time, 34% of respondents in the Energy Agency and 53% of respondents in the EPA never use web-conferences in their work routines, while 92% and 95% respectively use video-

conferences, which explains the preference of video-conferences by these two organisations in their employment processes.

4.1.5 Gender and social equity

A great degree of uncertainty remains when analysing the distribution between different gender groups and the rate of VM use. Overall men tend to use audio- and web-conferences more often than women, however, there seem to be no gender related difference when audio- or web-conferences are used daily or several times per day. When it comes to video-conferences, there seem to be no difference between men and women in relation to the frequency of video-conference use, while 43% of women and 28% of men have never used web-conferences. In all cases of frequent VM use the share of respondents with small kids at home is higher than those without kids while no difference has been observed for more seldom VM use on this parameter. Statistical tests need to be performed to find out whether there is any statistically significant difference between men and women, and employees with and without small kids on the variables discussed above.

In relation to social equity, on average 60% of respondents in three studied public authorities agree at least to a certain extent that VMs have increased their ability to participate and stay well-informed at the workplace. Main arguments to support this statement are threefold. First, VMs provide an opportunity for employees to participate in a larger number of meetings more often and from different locations (e.g. even while travelling). This also means that there is a higher chance to participate in a meeting, which otherwise would not be possible due to cost or time restrictions, should it be performed F2F. Participation in more meetings more often allows the employees to remain updated and well-informed on what is happening in their organisation. Second, VMs provide an opportunity to avoid travelling from the workplace, and therefore stay better informed. Survey respondents highlight that being away for a long time might result into missing what is happening at the workplace and interrupt the continuity of updates about certain work elements. Third, VMs may insure a better continuity of information flows at a work place due to more regular and more easily spread updates. In particular, the respondents positively react to the possibilities provided by VM technology to quickly get in touch with their colleagues in other locations and learn about their work situation, receive the latest information from the boss or important guiding information more continuously etc.

At the same time, on average 24% of respondents in three studied public authorities disagree that VMs have increased their ability to participate and stay well-informed at the workplace. The reasons identified from the qualitative comments are twofold. First, if one does not meet F2F with one's colleagues, there is a higher risk to lose access to informal information and decisions (e.g. in the corridors, during coffee breaks etc.). Second, the potential of VM technology could have been realised better meaning that a risk to exclude more distant offices of the organisation in the meetings initiated by the main office remains.

In studied organisations 53% of respondents do not experience that their ability to express themselves in a VM is restrained while 43% feel this at least to a certain extent. These figures have nearly no variation between three Swedish public authorities who participated in the survey. One of the most frequent comments taken up by the respondents on the reasons why it could be difficult to express oneself in a VM includes situations when there is a lack of balance in physical vs. virtual participation in a meeting. For example, if a bigger group sits in the same room while a smaller one or single participants take part in the meeting virtually, there is a risk that less attention will be paid to the needs of the smaller group and it might be easier to (unconsciously) exclude them from the discussions. The situation could be worsened with the "disadvantaged group" participating in a meeting via telephone. The main pathways to solve this problem include choosing a well-prepared and skilful meeting leader, who should make sure that all meeting participants are provided with an opportunity to express

themselves. A strict meeting structure, which is prepared in advance and shared among all meeting participants, is another way to combat the described problem.

Another group of hindering factors identified by the survey respondents is linked to the limitations of the technology used in VMs. One example is the problem with the sound or image lagging behind, which creates a risk that not everyone would be heard or seen in time for the one's comment or question. It is also important to remember to switch on the microphone in time for the comment to ensure it is delivered. Another example is linked to the lower media density in VMs as compared to F2FMs. VMs to a certain extent limit the regular pathways used by human beings to communicate such as body language, mimics, gestures etc., which might lead to restrictions in correctly estimating the time when to step in with a comment or question. The later risk might keep many participants silent. This is, however, true rather for audio-conferences, while video- and web-conferences help to overcome most of such barriers due to available live images of the meeting participants.

Other reasons why the meeting participants may feel restrained in expressing themselves in a VM are of a psychological nature. It might be difficult for one to step in with a comment or a question during a VM, if one is new in the organisation, if a meeting group is too big or if one is not used to make comments in F2FMs either and thus feels even less comfortable to do so in a VM. These situations create a risk that some important input might be missed. In a physical meeting one strategy to overcome such deficiency is to split people into smaller groups to ensure that everyone's participation is considered and collect the ideas from each group later. Such a possibility is restricted in a VM.

4.1.6 Performance, productivity and quality

When it concerns work efficiency, sometimes survey respondents found it difficult to assess changes in their own work efficiency due to VM use since they have been using VMs for quite a long time (or all the time) in their work and therefore the reference point is no longer present. Among those who responded to the question 44% perceived that their work efficiency has increased with the use of VMs, and 78% felt the same at least to a certain extent.

The major reason why the respondents felt an increase in their work efficiency is due to the avoidance of travelling to the F2FMs. Travel avoidance has two-fold implications in this sense: first, it saves time and effort, which creates more time and energy to fulfil other work duties; second, it allows for more uninterrupted work in one place (e.g. in the office). Travel avoidance is particularly relevant for employees in remote locations who need to travel to larger cities, where the key meetings are happening. Another reason for a perceived increase in the work efficiency is due to the possibility to participate in more meetings more often, if they are conducted virtually. This results into being better informed at the work place (see also sub-section 4.1.5) and having more discussions and interaction with many colleagues in different workplaces during a short period of time, which contributes to the overall work efficiency. Linked to this is the fact that VMs often allow for more efficient time use during a meeting due to their strict structure and more straightforward and direct moving to the point of the discussion.

While we discussed the reasons for VMs to increase the work efficiency of employees, there have been factors identified in relation to VMs, which might as well hinder the work efficiency. These include technology constraints and lengthy VMs, which might reduce the efficiency of the meeting itself; absence of the travelling time, which could be used efficiently for certain tasks (e.g. reading, thinking and reflecting, focusing on one task etc.); inability to network F2F and therefore increase personal competence, which has implications for more long-term work efficiency in an organisation; a risk of booking too many meetings, which eat up efficient working time and result into a lower work efficiency

due to the tiredness from a too fast working pace or too many hours spent in a VM; and time spent for administration a VM (i.e. its detailed preparation and management).

The question on whether work quality of employees has increased with the use of VMs was developed after the revision based on the expert feedback and the pilot survey. This was considered as an important but somewhat difficult to measure and follow up indicator. Survey results on this indicator do not vary much when comparing three studied organisations: on average 41% of respondents believe that the use of VMs has allowed them perform a job of higher quality, and 77% think so at least to a certain extent. One of the major reasons why 36% chose "at least to a certain extent" option is because the indicator is very much context dependent (as it was anticipated).

Reasons why VMs may increase work quality of employees are quite similar to the ones identified for the work efficiency. VMs help to avoid traveling, which may increase work quality in the following ways: 1) through time savings more time is opened to other work tasks; 2) by eliminating travel related stress the work is done better and in a more focused way; 3) by allowing a broader range of participants or experts with specific competences to take part in a meeting (e.g. from remote cities and countries) it is easier to fulfil certain tasks as well as achieve better quality in this. VMs also allow to book additional meetings, if needed, to ensure better communication, shorter and quicker updates between the work colleagues, which leads to better work results. VMs allow for immediate transfer of information: questions can be asked as they arise and responses are often immediate. Web-conferences, for example, allow asking very specific questions by pointing on the screen to the matter of concern.

At the same time, a number of situations have been highlighted by the survey respondents when VMs might not improve work quality but rather hinder it instead. These include (technical) problems with VM implementation, which may lead to inefficient meetings and misunderstandings; inability to use travelling time for other tasks (e.g. extra readings, meeting preparation and reflection, discussions with colleagues after the meeting etc.); a risk of work load increase with too many VMs, which leaves little time for quality work and preparation; and reduced opportunities for creative group discussions as compared to F2FMs.

4.1.7 Discipline and attention

According to the respondents in three studied organisations, the most important factors that contribute to the ability to keep attention in a VM include sound quality, meeting structure and undisturbed working environment. Sound quality is recognised as an absolutely necessary precondition for a VM to work, and 96% of survey respondents find that it determines their ability to keep attention. Sound quality is particularly crucial for audio-conferences, where the video is not available, however, even in the case of image/video presence the respondents find it much more important to have a good quality sound than a good quality image.

Another factor found important to keep the attention in a VM by 88% of respondents, which also influences to certain extent the sound quality, is the possibility to sit in an undisturbed environment. One of the issues, for example, in the case of Transport Administration is that many of its employees sit in the same open office, which implies simultaneous participation in different meetings over a telephone or Internet by various employees. This results among other things into sound disturbances and hindered possibilities to concentrate and/or contribute to creative discussions in a VM. While background noise "on the other side of the line" could be eliminated by switching of the microphones of those participants, who sit in a disturbed environment, there is a risk that the engagement of the participants will be reduced, which also complicates the situation for the meeting leader. The best solution in this case is to find a silent room from which one could participate in a VM.

It should be noted that a question that speaks about a meeting participant sitting in the same room or close to one's colleagues locally has been interpreted differently throughout the survey. Some respondents interpreted this question as if they sat in the same room with colleagues who worked on other tasks, while others - as that they sat together with their colleagues, who participate in the same VM. Therefore the replies were quite diverse on the matter, and there is a need to reformulate the question more explicitly, should it be used in future surveys.

With regards to a good meeting structure, 95% of respondents found it important to keep their focus and attention during a VM. It has been also highlighted that a well-organised meeting has a potential to be engaging not depending on whether it is a VM or a F2FM. One strategy to improve the discipline in a VM is for the meeting leader to prepare a meeting agenda in advance, send it to all participants before the meeting and then make sure this agenda is followed during the VM. Overall the experience and skills of a meeting leader contribute to the ability to keep attention in a VM by 87% of respondents to the survey.

It is mentioned by several respondents in all studied organisations that one of the most important factors to ensure the engagement and attention in a VM is the functioning of the technology. Access to technical support from the beginning was considered as important by 72% of respondents, while it was highlighted that this was rather applicable in the cases of the new technology use, absence of clear guidelines on how to eliminate technology failures and for the users with little experience of the virtual technology.

While verbal participation in a VM has been highlighted as an important factor to keep attention by 86% of survey respondents, factors such as the presence of participants' images and ability to comment in writing were considered less important. Meeting length was considered important by 78% of respondents, and the need for breaks in VMs has been highlighted to ensure that the focus stays present. Another strategy to keep attention in VMs is to keep them short but have more meetings instead.

4.1.8 Age

While it is quite difficult to observe any distinct pattern or correlation between the age and the rate of VM use before additional statistical tests have been carried out, it can still be noticed that the low rates of video-conference use (from no use at all to 1-5 times per year) are observed in the older age groups (over 50 years old). For web-conferences such low use rates are more equally distributed between the respondents in the age group between 30 and 59. When comparing frequent uses of VM forms (i.e. from every day to several times per day), audio- and web-conferences are more likely to be chosen in all age groups than video-conferences.

4.1.9 Meaning and significance

While the survey results presented in Fig. 2.29-2.31 may create an impression that VMs are perceived as the meetings to handle less important questions as compared to F2FMs (97% of responses), are of less importance (95%) and less serious (63%) than F2FMs, this might be a somewhat skewed interpretation of the data gathered in the survey. The problem with this data is that it is supplied in the best case by 72% of respondents, and in some cases by as low as 50% (in case of the opinions on web-conference use in Swedish EPA) to 31% (in case of the opinions on video-conference use in Transport Administration) of respondents. Therefore it is difficult to claim whether there is any definite trend observed in the relation to MS 1 and MS 2 indicators, and the technique applied to measure them can be questioned.

At the same time the (absence of) response was often supported by a qualitative comment with reflections on the question formulation and/or additional things to consider. In total 152 qualitative comments have been analysed throughout three studied organisations, which corresponds to 30% of total respondents on the questions related to the measurement of indicators on the meaning and significance of VMs. This figure includes 39% of respondents in the Energy Agency, 33% in the EPA and 22% in Transport Administration.

First and the most spread perception among all the respondents in the three studied authorities, who provided qualitative comments on the issue of VMs meaning and significance, is that the meeting form does not define the importance and seriousness of a meeting. Instead it is the meeting leader and its participants, who choose the applicable meeting form depending on the meeting objectives, structure, content, urgency and other practicalities (e.g. the location of meeting participants, frequency of follow ups, which activities the meeting requires, how well the participants know each other, available technology etc.). All meeting forms are recognised to be equally important and rather complement to each other, and the hope is expressed that there are no unimportant meetings and that all meetings have a reason to be held.

It is also highlighted by the respondents that very important questions can be discussed in any meeting form, which is decided to be the most applicable considering the circumstances. For example, audio-conferences are likely to be chosen to solve more urgent (important) questions that cannot be solved otherwise. Audio-conferences are often complemented by additional communication means including e-mail exchanges and web-conferences. In the Transport Administration, for example, web-conferences are well-established in working routines, and therefore are used to discuss all sorts of questions, both of high and low priority or importance. Such findings resonate well with the earlier discussed finding that only 14% of survey respondents find business travelling as an indication of (high) status. This allows hypothesising that 86% of respondents would not view VMs as an indication of a lower social status either.

One reason why VMs might not be chosen to discuss important questions is the risk of technological problems arising during such a meeting. However, this is clearly the issue of good preparation, habit and education on how to handle VMs as well as the access to technical support in the case of emergency.

4.2 Virtual meetings and organisations

This study involves three Swedish authorities with different activities, a varied organisational setup and different needs for meeting. Thus the difference in the implementation and use of VMs can be expected, and therefore also a difference in the responses from the employees in these organisations.

On a very general level, the respondents from SEA are more positive towards the effect of VMs on the work productivity, quality, staff turnover and organisation attractiveness. In three out of four questions they come out as the most positive and in two questions as least negative. The employees at SEA also show a tendency to be less uncertain about their attitudes against, being the least uncertain in three out of four questions.

The respondents from the STA have the most positive attitude to VMs in their relation to work productivity and otherwise show a general tendency to stay close to the overall average. In contrast, the respondents from SEPA are least positive in their attitudes to VMs in four out of four questions, and SEPA also turns out to be the organisation whose respondents are most uncertain in all questions.

In summary, indications of several small but consistent differences are observed between the organisations in this study. Although statistical tests need to be performed before any such difference could be called "significant", it is deemed important to already now identify the reasons behind such potential differences. This is addressed in the following sub-sections.

4.2.1 Efficiency

The efficiency area of expected organisational effects covers the ways of working, and economic and time aspects. The results from the survey clearly show that a majority of the respondents believe that their own work productivity and quality has increased with the use of VMs due to the increased possibility of working more flexibly. Interestingly, the respondents in leading positions have a relatively more positive attitude to the efficiency effects of VMs. From this fact, it is possible to assume that the leaders of the organisation would be interested in driving organisational changes that would accommodate further implementation of VM technologies.

The results of the survey indicate that respondents who have been using VM for a longer period or respondents who are using VMs more frequently are slightly more inclined to a more positive attitude to the efficiency effects of VMs. Even if the difference from the overall average is small, it is at least possible to conclude that the perception of increased productivity and quality is persistent over time.

In-depth interviews within the framework of this project confirm the findings on the efficiency implications. Meeting and working virtually is expected to enhance our possibilities to make a better use of the skills and competencies available inside the organisation. It is now possible to form virtual teams that include people in remote locations, whose involvement would not have been feasible otherwise. Organisations have also a chance to more easily make use of employees with special competencies for shorter assignments or for advice in special areas. The same applies to external competencies, e.g. in the case with experts and consultants.

VMs, especially when they are combined with other collaborative tools like instant messaging and document sharing, are likely to increase the availability of the employees. Disregarding the individual effects that this might have on stress levels and work-life balance, this increase in availability potentially leads to shorter feedback loops and less delays in work. Such tools make it possible to organise work and teams more flexibly in space and time. They also allow for employees to work more flexibly, e.g. from home or on the run. Additionally this may also result in better conditions for business continuity in case of unwanted business interruptions. More availability of employees and a flexible way of organising reduces the vulnerability of business activities to unexpected events.

Most people interviewed also agree that VMs have an effect on the meeting culture. Adding new forms of meetings also adds to further needs for clearer rules on how and when meetings should be held and who should be invited. There is a clear trend in empirical data that VM capabilities lead to more frequent and shorter meetings. Another tendency observed is that VMs lead to an unnecessary participation, which decreases the efficiency of the meetings. In order to be on top of its meeting culture, an organisation needs to provide guidelines or policies that define meeting types, meeting forms and sets standards for what roles that should be present in what meetings.

When it comes to the issue of a meeting efficiency, there is a controversy about the effects of VMs, namely whether VMs are more or less efficient than F2FMs. On the one side, there are people who think that VMs are *not* as efficient as F2FMs due to increased risks of misunderstandings, unfairness, over-invitation, cultural aspects and technical hassles. On the other side, there are people who believe that VMs are *more* efficient than F2FMs due to better preparations and a better structure of the meeting.

Why is the efficiency of VMs relevant? Meeting efficiency is an important determinant for a number of effects. Increased efficiency is a major contributor to cost and time savings, and it also influences the performance of virtual teams and the meeting culture. In addition, it can have a psychological effect on the general opinions and feelings about using VMs. For example, if VMs are generally perceived as inefficient, the organisation will have a harder time to push for increased use of VM forms.

Many of the free text comments given in the survey touched upon the issues of time savings and meeting efficiency. For instance, respondents comment on the question about what potential time savings are used for. There is an indication of awareness that it is important to use the time saved from avoided travelling for value adding activities and not for more meetings. Respondents also comment on the fact that it is too easy to create web-meetings and invite people, which might have a negative impact on general work productivity.

To show whether any increase in the cost efficiency has been achieved, the total meeting costs should be related to the output of these activities. If the output remains the same, and the costs are lower, than the efficiency per unit of production has increased. Another possibility is to show an increase in productivity. If the output has increased at a faster rate than meeting costs, the productivity has also increased. The importance to consider the level of total productivity has been identified as important by a number of the respondents in the survey.

4.2.2 Staff

As a result of this survey, the empirical support for the positive correlation between the staff turnover on one side, and the use of VMs on the other has been strengthened. Thereby it is now feasible to assume that VMs have a direct relationship to another important potential effect – an employee satisfaction level. Although many organisations in this study do measure employee satisfaction through recurrent questionnaires, few have questions that can be directly related to the use of VMs and other collaborative tools.

Despite this the employee satisfaction with VMs is something that many of the interviewees in this study find interesting and relevant to investigate and follow up. A common view is that VMs and tele-working, which is often mentioned in this context, will have an effect on the employees' perception on the work-life balance and satisfaction at work. The basic assumptions for this is that individual employees will experience a decrease in their travelling and also more control over their own time, which will make them feel more efficient. Some of the comments from the survey respondents in this area are about the increased possibilities for employees with children to be able to find a balance in their responsibilities as employees and their responsibilities as parents (for more details see section 4.1.2).

Survey respondents who occupy some kind of a leading position (e.g. responsible for personnel, supervisors, project leaders etc.) tend to be more positive towards the positive effect of VMs on the staff turnover. Thus it can be assumed that employees in leading positions are likely to drive the development of VM tools in their organisation. However, as some respondents point out, the increased use of VMs also tends to create risks for managers as it also restricts their possibilities to come in a physical contact with their staff. This could potentially be a problem in some situations, and particularly in the organisations that have a strong culture of management and detailed follow ups. Also being responsible for the employees' development and well-being may turn out as challenging, if the team is spread out geographically. For instance, early detecting the signs of an employee becoming worn-out or facing other personal problems that affect the work quality in the long term is much more difficult, if the manager meets his/her team members seldom.

If the use of VMs and collaboration contributes to more satisfied employees, this might also work as an advantage for the *employer branding*[9] of an organisation. In turn this might help the organisation to recruit and retain the competencies it needs. The survey performed in this study shows that a clear majority of the respondents think that VMs will have an effect on the attractiveness of their organisation. Again the respondents in the leading positions are relatively more positive, which should work as a driver to further develop and try to market the organisation as an employer which puts value into flexible work settings and employees' freedom to control and plan their own time. Despite the fact that it is difficult to discern any distinct patterns regarding the age and VM use, several survey respondents as well as interviewees believe that if an organisation aims to attract younger people (primarily those born in the 1980s and 1990s) should be prepared to accommodate the expectations to work more flexibly in space and time.

Measurement of the employees' satisfaction with the use of VMs and virtual collaboration could be performed with the help of the employee satisfaction surveys. For instance, adding a few questions about the travel- and meeting policy and the employee's perception of the efficiency of existing collaborative tools will reveal the needs for the improvement in training or technical solutions. Also adding a few questions about the use of VMs in both entry and exit interviews would provide the information about potential and former employees' perception of the organisation in this area. In fact, 82% of survey respondents working in HR departments are positive to the effect of VMs on the organisational attractiveness, even though it should be noted that the actual number of respondents is very small (only 11 persons).

[9] *Employer branding* refers to the image of an organisation as an employer, which has certain characteristics, e.g. it is a good place to work for people with special skills or for people with small children

5 Conclusions and recommendations

This report presented, analysed and discussed the results of the survey conducted in three Swedish public authorities including Swedish Energy Agency, Swedish Environmental Protection Agency and Swedish Transport Administration. The main purpose of the survey was to identify and measure potential effects of virtual meetings on these three organisations and their employees. Major findings, discussion points and some recommendations for individual employees and organisations are summarised in the sections below.

5.1 General observations

The survey developed within the framework of the project *Implications and Reporting of Virtual Meetings* can be applied by other Swedish public authorities than the ones tested in this study, and primarily by those who would like to evaluate the effects of VMs on their organisations and their employees, and who consider they have a reasonable number of employees (at least 100) with at least minor experience of VM technology (i.e. have used each form of VMs - video-, web- and audio-conferences – at least two times in their work).

With regards to the question formulations in the survey, some revisions need to be made to the question #15, which sought to assess the meaning and significance of VMs, as many comments were received on its irrelevance or strange formulation. Another item in the survey, which needs to be modified in order to avoid the ambiguity in future responses, is the part in question #24 referring to the fact that one sits in the same room or close to one's colleagues. This question has been interpreted differently by different respondents.

Reflecting on the general findings from the survey, STA can be considered as a good case for others to learn on the success of its experience with web-conferences. Furthermore, two major tendencies have been observed among the survey respondents: 1) employees in the organisations, which on average travel more often (STA), have higher preferences to reduce their business trips than those in the organisations, which travel more seldom on average (SEA and SEPA); 2) employees in the organisations, which on average travel more seldom (SEA and SEPA), find travelling more stimulating and enriching than those who on average travel more often (STA). Should an organisation seek to further discourage business travelling and promote VMs, it is preferable to keep economic benefits of business travelling as low as possible.

5.2 Virtual meetings and individuals

Although in ¾ of cases VMs reduce *negative stress* of employees by substituting business travelling, there are also instances when they can contribute to the increase in personal stress levels (e.g. due to equipment handling, a risk for too tight worktable when one does not need to travel etc.), which are important to follow up by the managers in a respective organisation. For example, to ensure a better technical performance of a VM tool and therefore reduce stress among its participants, it is important to have a knowledgeable and experienced meeting leader who should check well in advance that the meeting will function. Another recommendation is to have clear instructions placed in the room allocated for VMs on how to establish a connection and overcome certain technical problems, should they arise. The availability of technical support is particularly crucial, should a video- or a web-conference include three or more participants.

VMs are shown to save time inside and outside working hours for employees in all three studied organisations. There is a clear indication that both types of time savings enhance *work-life balance* of the employees. While many find business travelling stimulating and enriching, they seek to balance the frequency and length of their trips with their private lives and home responsibilities.

F2FMs are confirmed to provide their participants with more diverse communication possibilities and are perceived as more applicable for the first time meetings, creative discussions and longer meetings as compared to VMs. While SEA and the SEPA find video-conferences as the most *fun and stimulating* virtual meeting form, SEA ranks web-conferences as number one on this scale. This is directly linked to the rates and routines of the use of different VM forms in the three organisations.

Overall half of all respondents in three studied public authorities believe that VMs use can increase the *attractiveness of their organisation as a workplace*, however, VMs cannot be considered as a main or single factor contributing to this. The importance of tele-working for better flexibility and work-life balance of employees has been highlighted. F2FMs are preferred over VMs when it concerns the *employment process* in all three studied organisations. When a VM is selected for the parts of the employment process, video-conferences are preferred in the SEA and SEPA, while STA prefers web-conferences.

Overall men tend to use audio- and web-conferences more often than women except for the frequent use, when no *gender difference* has been discovered. No difference has been found between men and women in relation to the frequency of video-conference use. More women (43%) than men (28%) have never used web-conferences. In all cases of frequent VM use the share of *respondents with small kids* at home is higher than those without kids while no difference has been observed for more seldom VM users on this parameter. Statistical tests need to be performed on the above variables.

VMs increase the *ability* of employees *to stay well-informed* at the workplace by allowing them to 1) participate in more meetings more often and be updated; 2) remain at the workplace and follow the latest updates; 3) have a better continuity of information flows and news both in their own as well as in remote offices. VMs limit the ability of employees to stay well-informed at the workplace by putting them at risk to 1) miss informal information and decisions; 2) get excluded from the meeting initiated by the main office, should they be located in remote offices.

In studied organisations 53% of respondents do not experience that their *ability to express themselves* in a VM is restrained while 43% feel this at least to a certain extent. Situations when there is a risk for such restraining include a lack of balance in physical vs. virtual participation in a meeting, limitations of VM technology or psychological barriers. The main pathways to address the outlined problems include choosing a well-prepared and skilful meeting leader, who should make sure that all meeting participants are provided with an opportunity to express themselves. A strict meeting structure, which is prepared in advance and shared among all meeting participants, is another way to combat the described problems.

VMs are found to both increase and decrease employee work productivity depending on the circumstances and factors embedded. Reasons for increasing work productivity include travel avoidance and associated time/effort savings and ability to work uninterruptedly in one place, possibility to participate in more meetings more often and therefore stay better informed and quickly updated, and a more straightforward nature of VMs to move directly to the point of a discussion. Reasons for decreasing work efficiency include technology constraints and lengthy VMs, absence of travelling time, which could be used for certain tasks, inability to network F2F and therefore increase personal competence, a risk of booking too many meetings, and time spent for administration of a VM.

Reasons why VMs may increase *work quality* of employees include travel avoidance and associated time and effort saving, elimination of travel related stress, and access to skills and competences of colleagues and experts in remote locations; more frequent meetings ensuring a more continuous communication; and immediate transfer of information. Reasons why VMs may decrease work quality of employees include (technical) problems with VM implementation, inability to use travelling time for other tasks, a

risk of work load increase with too many VMs, and reduced opportunities for creative group discussions in VMs.

Sound quality, meeting structure and undisturbed working environment are among the most important factors defining the high levels of *participant attention* in a VM. These are followed by the experience of a meeting leader, ability to comment orally, access to technical support from the very beginning and descent image quality. Factors such as the presence of participants' images, ability to comment in writing and sitting in the same room with colleagues are considered less important by the respondents. Key strategies to keep the attention and focus of meeting participants in a VM include: 1) a well-prepared meeting structure with an agenda shared before the meeting and followed by a meeting leader; 2) insurance of undisturbed environment for VM participants, in which they can reduce background noise as well as better concentrate on the content of the meeting; 3) keeping VM short (under two hours) and organising more meetings instead, if needed.

Low rates of video-conference use are observed in the *age group* over 50 while for web-conferences – in the age group of 30-59. Audio- and web-conferences are more likely to be chosen than video-conferences for frequent uses in all age groups. Statistical tests need to be performed on these variables.

It is difficult to claim whether there is any definite trend observed in the relation to the indicators on the *meaning and significance* of VMs as compared to F2FMs, and the method applied to measure them can be questioned. Perceptions of some 30% of respondents suggest that the meeting form does not define the importance and seriousness of a meeting. Instead it is the meeting leader and its participants, who choose the applicable meeting form depending on the meeting objectives, structure, content, urgency and other practicalities. Such findings resonate well with 14% of survey respondents finding business travelling as an indication of (high) status. This allows hypothesising that 86% of respondents would not view VMs as an indication of a lower social status either. One reason why VMs might not be chosen to discuss important questions is the risk of technological problems arising during such a meeting. However, this is clearly the issue of good preparation, habit and education on how to handle VMs as well as the access to technical support in the case of emergency.

5.3 Virtual meetings and organisations

It is found relevant and interesting for the organisation to follow up on several indicators related to the organisational efficiency. This study shows that the relationship between VMs and their effects in this area (e.g. on the work productivity, organisational attractiveness etc.) is measurable.

Correctly configuring some characteristics in the organisational structure and thereby increasing the virtual maturity can reinforce positive effects of VMs in the organisation. There is a difference observed between the attitudes of the respondents in the three organisations in the survey. Partially such difference can be explained by how the organisation has chosen to apply their VM technologies. Whatever approach has been chosen, the implementation and increased use of VMs will not go unnoticed. To fully achieve all potential VM benefits and to minimise risks associated risks, it is important that the organisation also develops and communicates policies for VM application. Also VM users should be properly trained and educated. Not knowing how and in what situations to use VM technology is likely to increase the uncertainty with the users and lead to less benefits acquired by the organisation.

The recommended shortlist of indicators to measure in a given organisation is to start measuring the four indicators, which were tested in this study, in the following categories: perception of the relationship between work productivity, quality, staff turnover and attractiveness. These include:

- PPQ1: Share of employees who think their work productivity has increased with the use of VMs;
- PPQ3: Share of employees who experience their work quality has increased with the use of VMs;
- STO1: Share of employees who believe that VMs contribute to a decrease in staff turnover;
- SOA1: Share of employees who believe that VMs make the organisation more attractive as an employer.

The simplest way to do this on a regular basis is to combine it with employee satisfaction surveys. Changes in the above mentioned areas might work as triggers to:

- Investigate further implementation of new or more adequate tools (deepening VM implementation);
- Allow for more or new groups of employees become VM users (broadening VM implementation);
- Improve or extend training and increase user awareness and VM literacy;
- Alter travel- and meeting policies in a way that enables the employees find the correct level of flexibility in their work.

Therefore survey questions used in this study can be recommended to be used in the iterative data collection routines, e.g. in a recurrent employee satisfaction survey. If any specific data is searched for, it is recommended to supplement these surveys with interviews with specific target groups such as line managers or employees at the HR department.

However, on the top of what can be measured in employee surveys there is other information that can be used. Aside from what has been as tested in the survey, there are other indicators that can be used, if the organisation is interested in broadening the search for organisational effects of VMs. To fully measure and follow up on the organisational effects of VMs and other types of collaborative tools, the organisation also needs to collect data, which makes it possible to link and compare 1) overall productivity, 2) total meeting costs, 3) meeting efficiency, 4) VM utilisation levels and 5) emission data. In order to achieve this *base data* needs to be collected including: financial data (e.g. turnover or earnings), organisational data (e.g. number of employees, staff turnover, geographical spread) and time use data (e.g. from a time reporting system).

In order to make a full use of the information collected from the base data and the iteratively collected data, there is also a need to collect *specific data*. Such data in the case of VM effects on organisations includes primarily three pieces of information: travelling levels, VM utilisation rates and the use of resources including energy consumption and related emissions data.

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Annex I – Survey questions

Survey: EFFEKTER AV RESFRIA MÖTEN (Myndighet)

1. Är Du kvinna eller man?

	Responses	Percent
Kvinna:		
Man:		

2. Hur gammal är Du?

	Responses	Percent
- 24:		
25 - 29:		
30 - 39:		
40 - 49:		
50 - 59:		
60 -:		

3. I vilken typ av hushåll bor Du?

	Responses	Percent
Singelhushåll:		
Familjehushåll utan hemmavarande barn:		
Familjehushåll med hemmavarande barn:		
Annat / Kommentar:		

4. Om Du har hemmavarande barn, hur gammalt/gamla är barnet/barnen?

	Responses	Percent

5. I vilken myndighet arbetar Du?

	Responses	Percent
Bolagsverket:		
CSN:		
Energimyndigheten:		
Försäkringskassan:		
Jordbruksverket:		
Lantmäteriet:		
MSB:		
Naturvårdsverket:		
Pensionsmyndigheten:		
Post- och telestyrelsen:		
Riksarkivet:		
Rikspolisstyrelsen:		
Skatteverket:		
Tillväxtverket:		
Trafikverket:		
Transportstyrelsen:		
Tullverket:		
Annat:		

6. Vilken av följande beskrivningar passar bäst in på det område Du arbetar inom eller den funktion Du har? Välj det svar som är närmast eller ange "Annat/annan".

	Responses	Percent
Administration:		
Ekonomi:		
Handläggning:		
Inköp/upphandling:		
Juridik:		
Kommunikation/Information:		
Ledning:		
Personal/HR:		
Produktion:		
Teknik/IT:		
Utbildning:		
Utveckling:		
Inhyrd konsult:		
Annat/annan:		

7. Välj de alternativ som bäst beskriver Din arbetssituation:

	Ja	Ja, delvis	Nej	Total
Har Du en ledande befattning?:				
Har Du personalansvar?:				
Leder Du eller har Du lett medarbetare på distans?:				
Samarbetar Du med kollegor på annan ort?:				
Samarbetar Du med andra myndigheter?:				
Deltar Du i projekt med myndighetsexterna deltagare?:				

8. I min yrkesroll kallar jag till möten:

	Responses	Percent
Aldrig:		
1-11 gånger per år:		
1-3 gånger per månad:		
1-4 gånger per vecka:		
Dagligen:		
Flera gånger per dag:		

9. Hur ofta reser Du i tjänsten?

	Responses	Percent
Aldrig:		
1-5 gånger per år:		
6-11 gånger per år:		
1-3 gånger per månad:		
1-2 gånger per vecka:		
3 gånger eller fler per vecka:		

10. Hur stor del av Dina tjänsteresor är utlandsresor?

	Responses	Percent
Inga:		
Mindre än 10%:		
10-25%:		
26-50%:		
Över 50%:		

11. Hur upplever Du Dina tjänsteresor? Välj samtliga påståenden som stämmer in på Dig:

	Responses	Percent
Jag skulle vilja resa mer i tjänsten:		
Jag upplever att mina tjänsteresor ligger på lagom nivå:		
Jag upplever att jag reser för mycket i mitt arbete, men att min tjänst kräver det:		
Jag tycker att det oftast är stimulerade och berikande att resa i tjänsten:		
Jag skulle föredra att minska mina tjänsteresor om detta vore möjligt:		
Jag tror att tjänsteresor ses som ett tecken på (hög) status:		
Jag föredrar att resa till ett affärsmöte med övernattning:		
Jag föredrar att resa till ett möte över dagen (dvs utan övernattning):		
Jag upplever det som ett problem att tjänsteresor inkräktar på min fritid:		
Jag upplever att jag försummar min familj eller andra anhöriga personer på grund av mina tjänsteresor:		
Kommentar:		

12. Hur ofta använder Du Dig av följande typer av resfria möten? (Se frågetecken till höger för förklaringar. Om Du aldrig använt Dig av resfria möten, gå direkt till fråga 33, sida 6).

	Aldrig	1-5 gånger per år	6-11 gånger per år	1-3 gånger per månad	1-4 gånger per vecka	Dagligen	Flera gånger per dag	Total
Telefonkonferenser*:								
Videokonferenser**:								
Webbkonferenser***:								

13. Kommentera gärna Dina svar på den föregående frågan (dvs fråga 12)

	Responses	Percent

14. Hur länge har Du använt Dig av resfria möten?

	Aldrig använt	Jag har precis börjat	Mindre än ett halvår	Ett halvt – ett år	1-2 år	3-4 år	Mer än 4 år	Total
Telefonkonferenser:								
Videokonferenser:								
Webbkonferenser:								

15. Vid en jämförelse mellan olika former av möten (se vertikalt), upplever jag att (välj alla påståenden som Du anser stämma; har Du inte erfarenhet av en viss mötesform så välj "ej aktuellt/vet ej"):

	Används för att behandla mindre viktiga frågor	Känns mer seriösa än andra mötesformer	Signalerar att mötet är av mindre vikt	Känns mer roliga och stimulerande än andra mötesformer	Påverkar bilden av vår organisation på ett positivt sätt genom deras användning	Ej aktuellt/ vet ej	Total
Telefonkonferenser:							
Videokonferenser:							
Webbkonferenser:							
Fysiska möten:							

16. Kommentera gärna Dina svar på den föregående frågan (dvs fråga 15)

	Responses	Percent

17. Jag tycker att följande mötesformer (se vertikalt) lämpar sig för nedanstående syften (se horisontellt, flera alternativ kan fyllas i):

	Telefonkonferenser	Videokonferenser	Webbkonferenser	Fysiska möten	Total
Informationsmöten:					
Projektstart:					
Rutinmässiga projektmöten:					
Del av anställningsprocessen:					
Lönesamtal:					
Korta återkommande möten:					
Kreativa diskussioner:					
Workshops, öppna diskussioner:					
Utbildning:					
Uppföljning:					

18. Kommentera gärna Dina svar på den föregående frågan (dvs fråga 17)

	Responses	Percent

19. Vilka andra syften med möten / samarbeten är relevanta i Ditt arbete, och vilka mötesformer anser Du vara lämpliga för dessa?

	Responses	Percent
Telekonferenser:		
Videokonferenser:		
Webbkonferenser:		
Fysiska möten:		

20. Jag upplever att min arbetsproduktivitet har ökat sedan jag började använda resfria möten

	Responses	Percent
Instämmer helt:		
Instämmer i stort sätt:		
Instämmer till viss del:		
Instämmer inte alls:		
Vet ej/ ej aktuellt:		
Kommentar:		

21. Jag upplever att resfria möten hjälper mig att göra ett bättre jobb (högre kvalitet)

	Responses	Percent
Instämmer helt:		
Instämmer i stort sätt:		
Instämmer till viss del:		
Instämmer inte alls:		
Vet ej/ ej aktuellt:		
Kommentar:		

22. Genom att öka arbetsflexibiliteten för anställda, tror jag att resfria möten kan bidra till att minska personalomsättning i myndigheten

	Responses	Percent
Instämmer helt:		
Instämmer i stort sätt:		
Instämmer till viss del:		
Instämmer inte alls:		
Vet ej/ ej aktuellt:		
Kommentar:		

23. Genom att öka arbetets flexibilitet kan resfria möten göra vår myndighet mer attraktiv som arbetsplats

	Responses	Percent
Instämmer helt:		
Instämmer i stort sätt:		
Instämmer till viss del:		
Instämmer inte alls:		
Vet ej/ ej aktuellt:		
Kommentar:		

24. Hur upplever Du att följande faktorer bidrar till att Du blir engagerad och uppmärksam vid ett resfritt möte? Välj alla påståenden som stämmer in på Dig!

	I mycket hög grad	I hög grad	Något	Ganska lite	Inte alls	Vet ej/ ej aktuellt	Total
Att mötet är välstrukturerat:							
Att den som leder det resfria mötet är erfaren och bra på detta:							
Att mötet hålls kort (under två timmar):							
Att jag kan skriva kommentarer (chatta):							
Att jag kan delta verbalt (inte bara chatt):							
Att deltagarna finns med på bild:							
Att bildkvalitén är riktigt bra:							
Att ljudkvalitén är riktigt bra:							
Att jag sitter ostört i en bra miljö:							
Att jag sitter i samma rum som, eller nära, mina kollegor lokalt:							
Att jag kan få teknisk stöd från början / i tidigt skede:							

25. Kommentera gärna Dina svar på den föregående frågan (dvs fråga 24)

	Responses	Percent

26. Resfria möten frigör tid som jag använder till annat arbete

	Responses	Percent
Instämmer helt:		
Instämmer i stort sätt:		
Instämmer till viss del:		
Instämmer inte alls:		
Vet ej/ ej aktuellt:		
Kommentar:		

27. Resfria möten frigör tid för mig utanför arbetet

	Responses	Percent
Instämmer helt:		
Instämmer i stort sätt:		
Instämmer till viss del:		
Instämmer inte alls:		
Vet ej/ ej aktuellt:		
Kommentar:		

28. Användningen av resfria möten bidrar till att minska min stressnivå

	Responses	Percent
Instämmer helt:		
Instämmer i stort sätt:		
Instämmer till viss del:		
Instämmer inte alls:		
Vet ej/ ej aktuellt:		
Om så är fallet, vänligen berätta hur!:		

29. Jag känner mig osäker på hur man hanterar utrustningen för resfria möten, och/eller upplever en risk att mötet inte ska fungera tekniskt friktionsfritt (svara gärna för varje mötestyp!):

	Instämmer helt	Instämmer i stort sätt	Instämmer i viss del	Instämmer inte alls	Vet ej/ ej aktuellt	Total
Telefonkonferenser:						
Videokonferenser:						
Webbkonferenser:						

30. Vänligen kommentera Dina svar på den föregående frågan (dvs fråga 29)

	Responses	Percent

31. Resfria möten bidrar till att jag känner mig mer delaktig och välinformerad på min arbetsplats

	Responses	Percent
Instämmer helt:		
Instämmer i stort sätt:		
Instämmer till viss del:		
Instämmer inte alls:		
Vet ej/ ej aktuellt:		
Om så är fallet, vänligen berätta hur!:		

32. Jag upplever att resfria möten hämmar min möjlighet att komma till tals

	Responses	Percent
Instämmer helt:		
Instämmer i stort sätt:		
Instämmer till viss del:		
Instämmer inte alls:		
Vet ej/ ej aktuellt:		
Kommentar:		

33. Jag kommer att ha ökad nytta av resfria möten i mitt arbete framöver

	Responses	Percent
Absolut:		
Troligtvis:		
Kanske:		
Troligen inte:		
Nej:		
Vet inte/Inte aktuellt:		
Kommentar:		

34. Övrigt som Du vill tillägga

Kommentera gärna även själva frågeställningarna i denna enkät (t.ex. vilka frågor som var lätta/svåra att förstå och besvara, vilka frågor som verkade mer eller mindre relevanta för Dig, samt vilka frågor Du skulle vilja lägga till)

	Responses	Percent

Annex II – Survey opening message

Enkäten "EFFEKTER AV RESFRIA MÖTEN"

Med denna enkät vill vi få en uppfattning om vilka effekter användningen av resfria möten (dvs möten i realtid via video, webb och telefon) har på olika myndigheter, både såväl organisationen som på dess medarbetare. Under 2011 - 2013 medverkar ni och 18 andra myndigheter i projektet: "Resfria möten i myndigheter" (REMM) med syfte att öka och utveckla användningen av resfria möten. Parallellt med REMM-projektet pågår ett forskningsprojekt vid Lunds Universitet om vilka effekterna dessa möten får. Denna enkätundersökning är en viktig del i denna forskning.

Några av frågorna i enkäten berör Din privata situation. Vi ställer dessa frågor eftersom vi vill studera hur resfria möten påverkar balansen mellan arbete och privatliv. Alla svar hanteras helt anonymt, men Du kan naturligtvis välja att inte besvara dessa inledande frågor.

Genom att fylla i enkäten hjälper Du oss att förstå hur resfria möten påverkar individen och organisationen, något som vi vet väldigt lite om i dagsläget.

Stort tack för Din tid och hjälp!

Peter Arnfalk och Yuliya Voytenko, Lunds universitet