

# Service transformation—managing a shift from business travel to virtual meetings

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## Abstract

It has been shown that the potential for environmental, and financial improvements through the increased substitution of in-person meetings by virtual communication is considerable. However, it has also been shown that this potential is not automatically realized by investing in the technology that can enable virtual meetings. This paper describes two case studies that explored the factors that influenced communication and meeting behavior. A number of drivers and barriers for virtual meetings are identified, and, in addition, measures are proposed to improve the utilization of virtual tools for business communication.

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## 1. Prologue

This paper analyzes how an organization can facilitate a shift from using one communication mode to another; more specifically this document address ways and means to replace some business travel and face-to-face meetings with virtual communications. The two studies, on which this article is based, were not intentionally approached from a product service system (PSS) perspective; the focus was rather on studying corporate management in a situation where environmental improvements are highly dependent on the individual employee's behavior. However, while some of the common failures, e.g. videoconferencing have to do with technology related problems, we found that the attitudes, skills, and preferences of the employees expected to use the systems, are equally important. It is possible to see this, as a failure of the management in the organization that invests in the technological equipment, but it may also be expressed as a lack of system's perspective, which includes the human factors. It is thus; equally relevant to argue that our failure to optimally capitalize

upon the environmental promise of virtual meetings can be seen as a lack in development of an integrated PSS approach. Thus, this article introduces a complimentary input on the PSS point of view with regard to enhanced communication simultaneous with reduced needs for business travel.

## 2. Introduction

Regardless of whether Information and Communication Technology (ICT) is contributing to an increase of personal transport on a macroscale or not, the fact remains that there are currently a range of ICT tools available that allow people, at different locations, to communicate and to meet each other without having to travel, by having so-called virtual meetings.<sup>1</sup> The potential is that by using these approaches, an organization can lessen the environmental impact of its activities and, at the same time, obtain substantial financial improvements as a result of cost savings due to reductions in time and costs of travel. However, it is clear, from

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<sup>1</sup> With ICT mediated meetings or virtual meetings, we refer to situations when professional (business) meetings between geographically remote participants are made possible with the help of audioconferencing, videoconferencing or web-meetings (such as NetMeeting).

empirical evidence, including the research undertaken at the IIIIEE[1,2], that the volume of business travel is not automatically reduced as a result of ICT infrastructure being installed in a company. Our goal was therefore, to see how this potential can be realized, on a microlevel, by a change of management policies and practices within an organization.

Most organizations are strongly dependant upon their ability to communicate; internally as well as externally. Much of this communication takes place in the form of meetings, a more or less formalized form of ‘an assembly for a common purpose’ [3]. Indeed many professionals, particularly executives, spend most of their time at work, in meetings. Business meetings are held for a number of reasons; to inform, discuss, present, collaborate, sell, strategize etc. Frequently, there is more than one reason for a particular meeting. Still it seems safe to assume that no matter whether the purpose is to improve the team spirit or to do a sales pitch, the ultimate reason for meeting is the need to communicate.

Currently ICT technologies provide a number of possibilities to replace some of the in-person meetings. By substituting a physical meeting that requires one, or more, meeting participants to travel, with a virtual meeting, the organization can reduce the volume of business travel and thus, save money and at the same time reduce the company’s impacts upon the environment.

### 2.1. An optimal meeting?

But, before we proceed, it is important to recognize that it is not only the environmental and economic aspects that are of importance when deciding which meeting form<sup>2</sup> is most appropriate. The character of the information should be conveyed and the purpose(s) of the communication must be considered, but there are also other factors of importance. A meeting can, for instance, provide a good possibility to expand one’s personal network and/or build a deeper relationship with other meeting participants. Both of these outcomes could be useful for the individual as well as the organization.

The concept of ‘optimal meeting’ was developed to illustrate the complex range of aspects that influence the costs and benefits that relate to a meeting.

The benefits of a meeting can be divided into two categories, private benefits and organizational benefits.

- Private benefits should reflect the sum of each meeting participant’s individual benefits from a meeting. This could include e.g. building personal networks,

building deeper personal relations, the pleasure of getting out of the office and seeing new places, etc.

- Organizational benefits should reflect the sum of each participating organization’s use of the meeting, including the short-term and long-term consequences of the meeting. But organizational benefits could also include private benefits that are of use for the employer as well, for instance if an employee forms a close relationship with a customer, this is also likely to be of benefit to the employer.

The cost of a meeting can be divided into three categories, private costs, organizational costs and societal costs.

- Private costs should reflect the total of each meeting participant’s individual discomfort from a meeting, this could include; having to stay away from home over night, or getting up very early in the morning to catch a flight, fear of flying, etc.<sup>3</sup>
- Organizational costs should reflect the participating organization’s full cost of the meetings including, e.g. travel cost, cost of accommodations, cost of travel allowances, the connection cost (virtual meetings), cost of time not used for effective work during travel, etc.
- Societal costs should reflect the cost to society of a meeting including the environmental impacts caused by the meeting, but also the costs of infrastructure, health care etc., that have not already been included through taxes or pricing mechanisms, i.e. the externalities.

Both costs and benefits will, of course, be affected by the choice of meeting form. By choosing a meeting form in which the total benefits exceed the total costs by as much as possible, or possibly where the total costs exceed the total benefits by as little as possible, the meeting is optimized. This is based upon the assumption that the firm leaders recognize/accept that environmental impacts are valid factors for their business to factor into their decision-making process and that they believe that they have a responsibility to minimize their environmental impacts.

By introducing the concept of optimal meetings, we are not suggesting that complicated valuation models should be employed while deciding on which meeting form to employ. However, while the concept will not, in itself, provide guidance on how to change meeting behavior, it has been proven to be useful as a platform for decisions regarding business meetings, travel and the

<sup>2</sup> By meeting form we are referring to the means of communication selected for a meeting, e.g. physical meeting, videoconference, or audioconference supported by electronically shared documents etc.

<sup>3</sup> The terrorist attacks on September 2001 and the current increased fear of terrorism, has discouraged many people from flying. Many organizations have reacted by restricting their employee’s business travels.

environment. As the concept clearly addresses positive and negative impacts of meetings, we have found that it allows us to move a discussion past the stage of defending or critiquing current meeting behavior into a more constructive discussion about what to do and how to make such decisions in a more fully informed manner.

### 3. Two case studies

In case studies of two Swedish companies, both subsidiaries to Sweden's largest telecommunications company Telia AB, we had the opportunity to take a close look at the drivers and barriers for the substitution of business travel by virtual meetings. Our objective was to explore and understand which and how different factors influence meeting behavior within an organization, and to explore the managerial implications of these findings for a company's leadership that wishes to change meeting behavior in order to realize the environmental and financial benefits of virtual meetings.

The first case study was undertaken at Telia Research AB (TRAB). TRAB is a company with approximately 300 employees situated in four different cities in Sweden, conducting research within the field of telecommunications. All offices have advanced ICT infrastructures, including high quality videoconference facilities, conference telephones, Microsoft NetMeeting and similar electronic alternatives for effecting real-time communications. Another characteristic of this company is that the majority of the employees are highly educated and are experienced ICT users.

This study was finalized by September 2000 and the results were presented in a Masters thesis of one of the authors of this document [2]. Based on the findings from this study, a wide-ranging project was subsequently initiated within Telia AB Corporation to 'optimize' meeting behavior, ultimately, within the entire organization. As a part of this project a second case study was performed. The company studied was Telia Nära AB (Nära), a company 12 times the size of TRAB and with approximately 90 offices located throughout Sweden and having 3600 employees.

The company sells ICT solutions and services to private consumers and small companies. This company is different from TRAB not only in terms of size, and geographic locations, but also in terms of organizational structure, culture and the demographic composition of its employees. Characteristics of the two studied companies can be compared in Table 1.

This second case study, finalized in July 2001, applied basically the same methodology as for TRAB (as discussed in the following methodology section). As a result of a longer research period, and a sincere top management commitment from the studied organization, this second case study provided an the opportunity to put a

deeper research focus on the managerial implications for the organization that seeks to optimize its meetings.

### 4. Methodology

As explained before, our ambition with these studies was to explore how the environmental and financial promise or virtual meetings can be realized on a microlevel. Recognizing that meeting behavior<sup>4</sup> is likely to be influenced by many different factors, the case study form was chosen, as it is particularly appropriate when investigators desire to cover contextual conditions and when they rely on multiple sources of evidence such as inter-organizational partnerships and management information systems [5].

However, it should be noted that this is not a positivist research project where the successful implementation of ICT technology is analyzed through empirical studies of the experiences within a company that has successfully changed meeting behavior. Instead the case company was chosen because of its potential and commitment to the project and its willingness to change meeting behavior. This fact obviously needs to be reflected in the methodology. The methodology that was developed for this study is based on ideas of action research [6]. Distinguishing characteristics of the action research approach used were that we, as researchers, had an integral involvement in an attempt to change the studied organization. This intent was clearly communicated with representatives of the case companies. Moreover, in the research process, we did not only use the support from established theories, but also attempted to characterize and conceptualize our experiences into new theory development. The repeated research approach in the two case companies, which in turn, builds on the closely related experience from preceding research within Telia AB, can be described as a series of interconnected cycles, involving planning, acting, observation and reflection of the process after every step.

The practical methodology approach can be divided into three phases.

*Phase 1.* The character of the problem was identified through discussion with key people in the test organization. Based on the discussions, initial fieldwork, and literature studies within the field of communication theory, models of the factors influencing meeting behavior in the case study organization was constructed (See Figs. 1 and 2).

*Phase 2.* Based upon primary data, each of these factors was then evaluated. Primary data were collected

<sup>4</sup> The term meeting behavior is used for the collective choices that the individual, or individuals referred to, make with regards to meeting form for different types of meetings.

Table 1

A comparison of selected characteristics of the two studied case companies

Characteristics of the company	Telia Research AB (TRAB)	Telia Nära AB (Nära)
Number of employees	300	3600
Number of office locations	4	35 (90 Offices)
Type of business	R&D	Sales, service
Share of employees with a university degree	Very high	Low-medium
Organizational character <sup>a</sup>	Organic	Formalized
Decision-making	Decentralized	Centralized
Meeting infrastructure (supporting virtual meetings)	In-house videoconferencing, conference telephones, NetMeeting installed	Out-sourced videoconferencing, conference telephones, NetMeeting installed
External business contacts	Limited	Numerous
Clearly stated commitment to use virtual meetings	No	Yes

<sup>a</sup> An organization described as 'organic' is characterized by flexible working arrangements, basing their coordination on mutual adjustment or direct supervision. On the other hand, an organizational structure described as 'formalized' or 'bureaucratic' can be described as bureaucratic to the extent that its behavior is predetermined or predictable, standardized in effect [4].

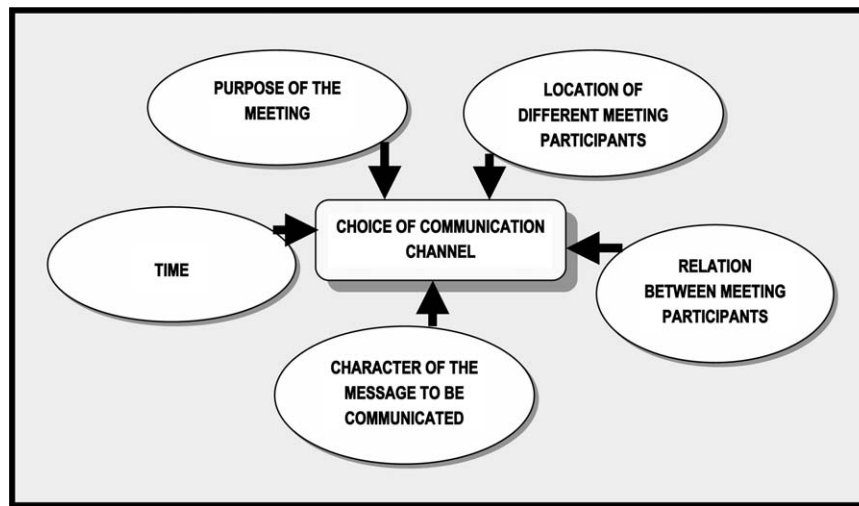


Fig. 1. A model of contextual factors influencing meeting behavior at TRAB.

through a web-based survey that allowed us to map out values, preferences, opinions, skills and attitudes of employees in relation to: (a) virtual meetings in general as well as the currently available ICT infrastructure and the ICT support in the organization; (b) travel and physical meetings in general as well as the current culture, organization and management control system at the case study organizations relating to business travel; and (c) environment, career opportunities, work satisfaction, free time, money and other forms of compensation.

In addition, interviews were conducted with employees representing a random sample of the full population. The results of the interviews provided a deeper understanding of how people in the organization communicate. The interviewees were asked to bring to the interview, a record of all meetings that they had had during the last two weeks. Then each meeting was discussed by mapping out who they met, what media were used (physical or different virtual solutions), why these

media were selected, the purpose of the meeting, what tools (e.g. whiteboard) they used, the form of the meeting (e.g. discussion structured according to an agenda, a workshop, etc.) who initiated the meeting and a few additional questions. These interviews not only gave a detailed picture of the needs that the employees have in different meeting situations, but also provided useful data on the groups that are most important to influence i.e. the most common initiators of meetings. Provided that the sample is representative and large enough, the results can also be extrapolated to give an estimation of how many physical meetings could be replaced by virtual meetings in the organization, and thereby, make it possible to prepare quantitative estimations of cost and environmental savings to be compared with investment costs.

Finally, some interviews with key people within the organization, were necessary to gain an understanding of the organizational factors that are or can be used to

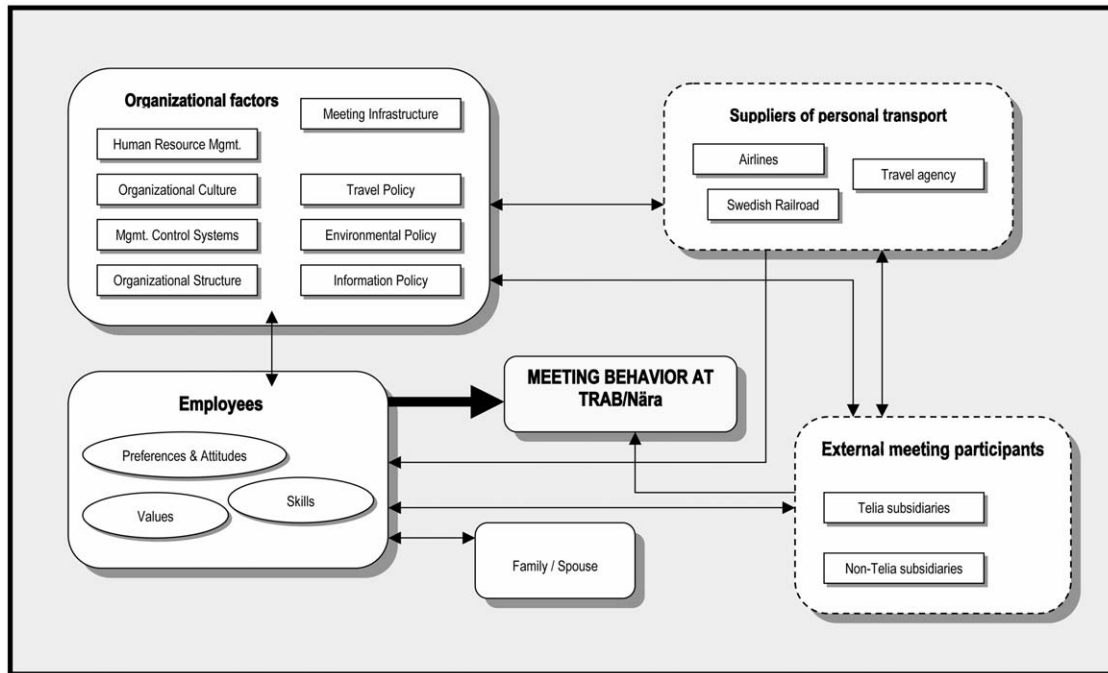


Fig. 2. A model of contextual factors that may influence meeting behavior at TRAB/Nära.

support virtual meetings, such as the ICT infrastructure, human resource management, management control systems, travel management etc. These interviews allowed the research team to identify who in the organization has the skills and the power, to initiate changes in these factors.

By analyzing the data, drivers and barriers for virtual meetings and manipulable and non-manipulable variables were identified.

*Phase 3.* A literature review of appropriate theories related to change management and a review of case studies of good and bad experiences with ICT-based communications within organizations formed a backdrop, for the final analysis of the findings and the design of recommendations for action.

The findings and proposals were discussed in a workshop together with key people within the organization, to benefit from their expertise and to ensure shared ownership of the final recommendations. The workshop was structured in two main segments. The first segment was comprised of a brief introduction to the concepts of optimal meetings, and some quantitative data were provided on the current meeting behavior within the organization followed by discussion of the costs and benefits related to this behavior. This session resulted in a documented consensus statement that explains why a strategy of optimal meetings, should be developed and implemented in the organization.

In the second segment, the findings of the initial analysis of meeting behavior within the organization were presented and discussed. After that, a ‘brain-writing’ session was held where all participants had to gener-

ate a number of suggestions of what measures can be undertaken to initiate a change of meeting behavior. These suggestions were then presented, discussed and prioritized by the group.

At this point, the case studies of TRAB and Nära ended, but the process has further developed in the following ways:

- (a) A person at Telia has been assigned to give a concrete form to optimal meetings, and to implement the recommendations derived from the project at a company group level.
- (b) A high-level executive steering group has been established to take the necessary decisions on a company-wide policy level.
- (c) The researchers act continuously as discussions partners in the development of new policies, changes in existing policies, guidelines for and practical design of the virtual meetings’ setting.

## 5. Looking for explanations—communication theory

As discussed in the Introduction, communication is an essential part of successful operations of businesses. It is therefore, reasonable to take a closer look at research within the field of communication theory for the purpose of finding theories that can be used to explain meeting behavior within organizations.

There are two prominent schools within the field of communication studies. The first school looks at com-

munication as the creation and exchange of meaning. This school is primarily concerned with semiotics, looking at the content of communication and its role in culture. The second school is looking at communication as the act of transferring a message. This school is concerned with the efficient and accurate transfer of messages and the role of different types of media in this process [7]. Since we were primarily interested in why people select a certain meeting form and not the content of their communication, it was the latter school that we decided would be most relevant for the purposes of this study.

### 5.1. Media richness theory

‘Media richness theory’, is based on the idea that the choice of communication channel should be based on the character of the information that needs to be communicated. Originally, intended to be a prescriptive model for choice of communication channel, guiding organizations towards increased communication efficiency [8,9], media richness theory has gradually been transformed into a theory, that explains how and on what grounds the communication channel is chosen within organizations [10,11].

According to this theory, different communication channels can be rated according to their density. The density is a measure of each channel’s potential for the effective transfer of complex, and ambiguous information, based on the following criteria [12]:

- potential to provide continuous feedback;
- ability to send and receive multi-signals (e.g. body language and tone of voice);
- possibility to customize the message according to the specific characteristics of the situation and the receivers;
- potential for language variation.

The density of the channel is said to correspond to its bandwidth, i.e. the amount of information per unit time that can be transferred. For effective communication the bandwidth, or the density, of the media should correspond to the character of the message.

Media richness theory, argues that to communicate efficiently and to avoid misunderstandings, a message with a high degree of complexity and/or ambiguity should be transferred through a dense medium. Clear and simple messages should conversely be communicated through a low-density medium thus, avoiding redundancy and the risk of overworking the information [13].

If one agrees with the idea that this theory can be used to explain the meeting behavior in organizations, it is assumed that the communication channel is chosen based on the ambiguity and complexity of the infor-

mation that should be communicated in relation to the individual’s perception of the density of the media [10].

Media richness theory, has been criticized for being too simplistic in these assumptions, and it has been claimed that other factors such as situational and social factors must also be taken into account if we wish to explain why a certain type of media is chosen for a communication task. These types of factors would not only influence the behavior directly but also indirectly by influencing the perception of different types of media.

As a result of this critique, many different versions of an expanded media richness theory, have been developed. Trevino et al. [14] expanded the theory to encompass two new factors influencing the choice of media, situational factors (time and place) and symbolic considerations (i.e. the ambition for a dignified form of communication). Fulk [15] suggests, in his ‘social influence model’, that the most important influence on the individual’s choice of communication media is his/her co-workers, and yet another study has shown that the individual’s personality also, to some extent, explains the choice of media [16].

Others argue that it is the degree of personal character in the message that influences the choice of media rather than the ambiguity and complexity. This argument is based on studies showing that employees preferred to use the phone for messages of a personal character, whereas e-mails were considered more appropriate for impersonal, work-related communication [13].

### 5.2. Channel expansion theory

One offspring from media richness theory, that is of particular interest, when one has the ambition of promoting the use of a certain type of media, is the ‘channel expansion theory’. This theory argues the bandwidth of a medium expands over time as the user learns how to use it better and better. This means that a less dense medium could be developed into a denser medium providing that the parties using it are on the same level on the learning curve for using it [17].

The channel expansion theory, has been supported by findings in a number of studies. One example that is often mentioned is that people with a lot of computer experience frequently rank e-mails much higher on the media richness theory, density scale than people with less computer experience [18].

### 5.3. Why is channel expansion theory relevant for an environmentalist?

Channel expansion theory, argues that intense use of a highly dense medium can prevent other less dense media from evolving. Therefore, we can draw the conclusion that there are not only a number of situational, social, and other factors that may influence meeting

behavior, but that the current meeting behavior in the organization will also be influenced by previous meeting behavior, unless something is done to change the situation.

But the most interesting aspect of channel expansion theory, is not that it can help to explain the current meeting behavior. The theory is particularly relevant because it can be used to send a clear message about what is important when managing meeting behavior within an organization with the intent to promote a specific type of communication channel. It tells us that it is important to have uniform meeting behavior so that everyone is on the same level on the learning curve for the types of media that are used, and it also tells us that by promoting the use of virtual communication channels it is possible to expand the bandwidth of these types of media, thus, increasing their range of use, and the potential for increased substitution of physical meetings with virtual meetings.

## 6. A model of meeting behavior

It was not our intention to try to either prove or disprove any of the theories presented above. Instead, we drew from all of these theories in an attempt to understand what influences meeting behavior at the case study organizations.

The findings in the TRAB study supported the arguments of the media richness theory, that the character of the information that needs to be communicated is one factor that influences the choice of media. However, the findings also support the critique of the media richness theory, in the respect of not taking other important factors into account. Clearly, situation-specific factors such as time, location and the relation between the meeting participants, the purpose of the meeting and the character of the message that is to be communicated, also plays an important role in the choice of communication channel or meeting form. Information contained in Box 1, includes a number of quotes, underlining the importance of these factors, that were collected from the TRAB and Nära studies.

We called all these type of factors situational factors as they are specific and change for each meeting. A number of situational factors are depicted in Fig. 1. The characteristics of these factors are such that it is difficult and sometimes inappropriate to manipulate them with the intention of changing meeting behavior.

These quotes emphasize: (a)–(e) the importance of different situational factors' influence on the selection of communication channel; (f) that a low-density medium can be preferred over a high density medium; and (g) supporting the channel expansion theory.

The importance of situational factors attracted our

### Box 1. Quotes collected from the TRAB and Nära interviews and surveys

- (a) "[the choice of communication channel] depends on the topic discussed"
- (b) "[selecting a virtual or a physical meeting] depends on the length of the meeting in relation to the time it takes to travel"
- (c) "I would substitute only the [physical] meetings that require very long time to travel"
- (d) "[We have selected a physical meeting form as] the purpose [of our meetings] is to listen, learn, and to support. You are filled with inspiration after such a meeting; a feeling of pride, and the meeting is characterized by spontaneity. Moreover, the people in the group don't know each other that well, so the physical meetings contribute to a positive atmosphere. In an audioconference, the purpose of the meeting should be well defined and you should have 'something to explain'"
- (e) "[We can not use virtual communication for] the first two meetings... we have to get to know each other first"
- (f) "I prefer audioconference meetings [to videoconference]. I think the video-part disturbs more than gives benefit"
- (g) "We use audioconferences more [as] they are working better and better"

attention to examine how the type and character of a meeting affected the choice between physical and virtual meeting forms. In the Nära survey, respondents were asked to specify in what type of meeting situations they preferred using virtual communication, and correspondingly, in what situations they preferred the physical alternative. The results are listed in Tables 2 and 3.

From these data, it became clear that the virtual communication alternative was considered more appropriate for certain types of meetings than for others. The results at Nära indicate that the virtual meeting alternative may be best suited for follow-up and information tasks, as well as for short and repetitive meetings. Particularly for 'kick-off' and 'kick-out' meetings, i.e. meetings in the beginning and end of a project, the physical alternative were considered the most appropriate.

We have to recognize that the prerequisites and preferences differ between organizations, and that each organization will have to identify its own set of preferences. Nevertheless, the results clearly underscore the impor-

Table 2  
Types of meetings when virtual alternatives are preferred

Form of meeting, categories of words	Number of respondents
Follow-up, check-up meetings	56
Informing, information meetings	51
Time: short meetings, maximum number of hours	37
Regular, repeated, consecutive meetings	29
Monthly-, weekly meetings	11
'Working' meetings	10
Decision-making	8
(When people) know (each other)	8

The table lists the number of respondents that stated a certain type of meeting in a survey at Telia Nära.

Table 3  
Types of meetings when the physical alternative is preferred

Form of meeting, categories of words	Number of respondents
Kick-off, kick-out	79
Discussion	11
Long meetings	10
Customers, external (contacts)	9
Important meetings, issues	8
Information meetings	6
'Working' meetings	6
Brainstorming	5
(Situations requiring) creativity	4
Many participants	3

The table lists the number of respondents that stated a certain type of meeting in a survey at Telia Nära.

tance of considering the type and character of meetings when choosing between the virtual/physical meeting alternatives.

While these situational factors evidently influence the choice of meeting channel, the findings in the TRAB study also indicated that they still do not cover the whole picture. It must be remembered that the meeting always takes place in a context. The meeting is not an isolated event, and in real life, meeting participants are likely to weigh many different objectives against each other, when deciding on the most appropriate meeting form. To place the meeting behavior into its context, a model of contextual factors that may influence meeting behavior, in addition to the above-identified situational factors, was developed. This model, presented in Fig. 2, includes organizational factors, travel service providers, employees, the family of the employees, and the external meeting participants. The same model was used when studying contextual factors in the Nära study.

A model is, by definition, not a complete picture of the context for each meeting participant. The rationale

for including the factors selected, was that each of them has either a direct or indirect interest in the meeting behavior in the companies, and could, therefore, influence it in some way either consciously or unconsciously. The second rationale is that all of these aspects influence a majority of the employees in the organizations.

The arrows in Fig. 2 indicate the flow of influence among the different factors in the model. As meeting behavior ultimately is up to the individual, it is argued that only employees and external meeting participants can influence the meeting behavior directly. The other factors can influence meeting behavior by enabling different ways of meeting and/or influencing the choices of employees and the external meeting participants.

We found that situational factors play an important role in the choice of meeting form, and that these factors should be taken into account when deciding whether to have an in-person meeting or to use a form of virtual communication. However, with the objective of this research in mind, the questions we asked were not only—which are the more important factors influencing meeting behavior, but also, which of these factors can and should be manipulated, either directly or indirectly, in order to influence the meeting behavior?

As stated previously, the situational factors can be very difficult to manipulate. It is also questionable whether it is appropriate, to attempt to manipulate situational factors, for the purpose of decreasing the environmental impact of business meetings. It would, for example, be very awkward to manipulate the character of the message to be communicated, for the purpose of adapting it for virtual meetings. While it would be entirely possible to manage location of different meeting participants to reduce business travel, simply by relocating all employees to one office, this would not only have significant social implications for the employees that were forced to move, it might also affect the core business of the company.

Many of the contextual factors could however, be manipulated by the organization for the purpose of introducing or reinforcing drivers, or for removing barriers to virtual meetings. The preference, skills and values of the employees in the organization can be impacted by manipulating factors within the organization. External factors are more difficult to influence but it seems reasonable to assume that the organization could influence the meeting behavior of external meeting participants, and in particular those with whom they have frequent collaboration, through special agreements and/or requirements regarding available meeting infrastructure. The travel agency could be influenced through agreements regarding the type of service that they should provide to the organization members.



## 7. Analyzing the influence of contextual factors at TRAB and Nära

How do the different contextual factors influence the meeting behavior in the two companies studied, and can these be manipulated? In an attempt to answer these questions, the barriers and facilitators pertaining to different factors presented in Fig. 2, were analyzed for each of the companies. The analysis is based on company literature, interviews and surveys conducted within the two studies. A compilation of the main findings is presented in Table 4, structured according to the suggested influencing factors.

Based on these findings, an evaluation was made of the extent that the studied factors can be manipulated by the management of the organization. Fig. 3, depicts the result of this analysis. The shades in the model indicate the level of influence that the management of the companies have over the different factors.

## 8. Lessons learned

In the following section, we sum up the lessons learned from the two case studies at TRAB and Nära, starting with general findings relevant for both companies, followed by more specific experiences from the TRAB and Nära case studies.

### 8.1. Managing a shift—beyond the technology issues

While ICT tools and infrastructure enable people to meet virtually, the spontaneous shift from in-person to virtual meetings in an organization is very limited, even in a company that is characterized by a very high level of 'IT competence' and a general curiosity for new ICT solutions. Although, part of the explanation can be attributed to technical inadequacies, it is clear that many other factors influence the meeting behavior in the studied organizations.

A general insight to derive from these studies is that if a reduction in travel is to result from the increased use of ICT, systems have to be put in place to encourage, support and provide incentives for the increased substitution of physical meetings with virtual meetings. The success of virtual communications is as dependent on 'people-issues' as it is on 'technology-issues'. This could be a simple measure such as training and information about available options, as well as support functions and user guidelines. Do not take for granted that people know how to use the tools available to them even if they are familiar with working with ICT. Also, do not forget that communication over a new medium requires some 'getting used to' before it feels comfortable for the users. It's just like learning to ride a bicycle, it is not until you

know how to do it intuitively, that you can forget about the process of biking and start enjoying the scenery.

### 8.2. The importance of training

The lack of training was particularly evident in the use of videoconferencing. Awareness of how and when to use the tools was remarkably low in both organizations, particularly bearing in mind that they are both telecom companies. A large number of the respondents had never tried videoconferencing, and those who have, often very limited training on how to use the media. Consequently, the use frequency of the media was very low.

However, it is not clear that training and information will be enough, as (returning to our bicycle analogy) one also needs to provide a bicycle that is suitable for the purpose of the user, and ultimately convince him/her that bicycling has benefits that can outweigh the benefits of the alternatives, e.g. a Boeing 747 (business class, drinks included). These measures may include changes of the ICT infrastructure, the provision of incentive systems for a greater use of virtual meetings, the complication of the procedures involved in organizing a business trip etc. Here it should be stressed that the situation, in particular, with regard to organizational factors such as human resource management, organizational culture, management control systems and organizational structure, meeting infrastructure etc. are very different in different organizations and thus, cannot be generalized.

### 8.3. Management influence

The factors that were found to present either a barrier or a driver for virtual meetings in the case companies include; meeting infrastructure, organizational culture, employee preferences, attitudes and skills, possibly employee values, the family situation, external meeting participants and, to some extent, suppliers of personal transport. What is interesting is that the management of a company can manipulate some of these factors, directly or indirectly, in order to stimulate the increased substitution of physical meetings with virtual meetings. The most difficult factor to manipulate is the organizational culture, and this factor may constitute a major barrier for the introduction of new ways of meetings. However, through leadership and direct modifications within the other internal factors, management may consciously influence the organizational culture as well as the skills, preferences and attitudes and values of their employees.

### 8.4. Project leader's influence

In addition to managers in the line organization, project leaders play a key role in this respect. As the organizations increasingly shift towards working in projects,

more and more meetings are initiated within these projects. Commonly, it is the project leaders' role to call upon the participants to join the meeting, and depending on this person's attitude towards, knowledge of or skills in using virtual meetings, the use of these media for project meetings are more or less common.

### 8.5. Policy issues

In policy statements, the management can clearly express their support for the use of virtual meetings within the organization, and create a foundation for its development. However, the response to the policies

Table 4

Summary of conditions constituting drivers and barriers for an increased substitution of physical meetings found at TRAB and Nära

	TRAB	Nära
<i>Organizational factors</i>		
Organizational structure	Geographically dispersed organization working largely in projects—large need for remote contacts. No real drivers or barriers for VM found.	Geographically scattered organization, most of the work in the line organization, but also much project work—also large need for remote contacts. Drivers and barriers as TRAB.
Organizational culture	Technical curiosity an initial but not long term driver. Highly independent employees do not want to be told how to do their job, which works against the VM according to channel expansion theory.	The prevailing 'cost-awareness' is a strong driver for VM. Relatively high acceptance of directives regulating traveling and VM. No strong technical curiosity, rather hesitance to accept new, complicated methods.
Management control systems	Not drivers as control systems that reward economic or environmental efficiency hardly exist. Budget for travel not a limiting factor.	Both the budget process and the balanced score card system, helps to ensure that costs are kept down on a group and individual level, and provides incentives, in the form of bonuses, to lower costs. Nära's EMS identifies travel as the company's main source of environmental impact, and therefore, promotes VM to reduce them.
Policies	Telias' travel and environmental policies strongly support VM, but VM is not mentioned specifically, in TRABs' travel policy. Policies generally have little influence on employees at TRAB; e.g. only 16% claim knowing of the content in the environmental policy.	VM is mentioned in Nära's travel and environmental policy. However, these seem to have limited effect on the CTMV. A strong driver is the information policy, effectively influencing the use of VM.
Meeting infrastructure	Two types of in-house VC systems are available. Repeated failures discourage 60% of the respondents from further use. AC & NetMeeting are readily available, few web-cams.	Out-sourced VC facilities, numerous AC conf. telephones, 'quiet rooms' designated for VM. NetMeeting readily available, few web-cams. Yet more 'quiet rooms' with AC & NetMeeting were requested. Approximately, 83% of the interviewed employees were disturbed by poor reliability in NetMeetings.
Human resource management	No training in, and little information given about VM. Information has to be collected on the intranet. Most employees do not feel comfortable to handle the VC equipment.	As for TRAB.
<i>Employees</i>		
General	Since there is no major driver for VM in the TRAB organization, the CTVM is highly dependant on the individual.	Strong promotion of AC and a formalized management structure supporting it, leaves less up to the individual to decide on the CTVM as compared to TRAB.
Preferences and attitudes	General attitude of VM as second-class meetings. PM signal higher interest, seriousness and respect than VM. 70% enjoy getting out of the office, 50% agree that frequent BT is an indication of professional status. 70% enjoy BT abroad, but only 30% enjoy domestic BT. AC is the most preferred mode of VM.	More than two-third thought that a larger share of PM should be replaced with VM. AC is becoming accepted as a business meeting alternative. VC is seen by over 80% as too difficult, cumbersome, and expensive alternative. AC is the most preferred mode of VM.
Skills (and knowledge)	Many employees are unfamiliar with the VM tools. Only 40% think it is easy to operate the VC facilities. Frequent users found VC easier to handle. Project managers are not more skilled than other workers. Only 16% can handle VC support tools and 15% NetMeeting as a support tool to AC.	98% of the respondents used AC, 14% VC, and NetMeeting was used by 77%. At half of the office locations, respondents were not aware that they had access to VC facilities. More than 90% are disturbed by lack of meeting skills during AC (forget to mute, noise in the background, side discussions etc.). NetMeeting is relatively new and thus, little experience has been obtained with it until now. Thus, the statement—"we can become much better at this".

(continued on next page)

Table 4 (continued)

	TRAB	Nära
Values	Weak link between the employees' environmental concerns and CTVM.	As for TRAB.
Family/spouse	Large influence on CTMV, particularly employees with small children prefer to travel less.	As for TRAB.
<i>Suppliers of personal transport</i>		
General	None of the individual travel service providers had any significant impact on CTVM. As a whole they may have influence due to the travel-sector's extremely user-friendly ordering and booking systems.	
Airlines	Have bonus system for frequent travelers, no direct indication that this would influence CTVM, although one-third agree or strongly agree to the statement that they appreciate the benefit of 'frequent flyer miles', and 78% agree to the statement that a lot of people appreciate the possibility to buy duty free goods on a BT.	Not covered in the Nära study.
Swedish railroad	Have bonus system for frequent travelers, no indication that this would influence the CTVM. Rail only represent 10% of the BT.	Not covered in the Nära study.
Business travel agency	Not providing any specific incentives for travel, but offer a high service level.	Not covered in the Nära study.
<i>External meeting participants</i>		
General	External meeting participants clearly influence meeting behavior in respect of initiating meetings, and thereby deciding the form of meeting.	
Non-Telia subsidiaries	Hesitant to ask external contacts for a virtual meeting, as it may not be seen as 'appropriate'. Most respondents had no experience of e.g. a VC with external persons.	For business meetings—as for TRAB. However, standard contact with customers (>4 million) was predominately held via normal telephone calls.
Telia subsidiaries	Less than for non-Telia contacts, but still considerable hesitance to suggest VM to other companies within the Telia group. Approximately 50% of the meetings included persons from other Telia companies.	As for TRAB, but Nära has a lower % of inter-company meetings. Several Nära employees mentioned that they had promoted the use of AC in projects other Telia subsidiaries.

PM, physical meetings; VM, virtual meetings; VC, videoconference/ing; AC, audioconference/ing; BT, business travel; EMS, environmental management system; CTVM, choice between the travel and virtual meetings alternatives.

strongly depends on how well they are supported by the management, and if they are accompanied by a system for implementation. If not, policies suffer the risk of becoming 'toothless' and ignored.

By agreements and policy statements relating to virtual meetings and business travel, it is also possible to influence external meeting participants, especially among other Telia subsidiaries.

### 8.6. External factors

Travel service suppliers could act as a potential barrier to an expanded use of virtual meetings, simply because they make travel so 'user-friendly', as illustrated by the quote from the Nära survey "as long as it is simpler to travel to a meeting than to arrange a virtual meeting, people will chose the traditional, simple way". Transportation providers are likely to be difficult to influence. There is, of course, the possibility of changing travel agencies that are more cooperative in helping the company to decrease it's reliance upon certain modalities of transportation. However, since the major railway and air-

line in Sweden have monopolistic positions on many routes, this possibility is limited.

The current services offered by the travel agency do not include the virtual meeting alternatives, and currently this service organization does not promote the non-traveling alternative. However, through an agreement between Telia AB and the business travel agency, it might be possible to modify the travel agency's influence on virtual meetings. A move in this direction is currently taking place between the construction company Skanska AB and their main travel agency Bennet BTI. Skanska is aiming to cut cost for traveling by shifting towards a larger share of virtual meetings, but in doing so, they are dependant on ensuring that their travel agency can suggest and provide a solution for a virtual alternative to the physical travel. As Skanska is a large multinational company and naturally a treasured customer to a travel agency, Bennet BTI has agreed to help Skanska in their efforts, and the two companies are now developing a sort of 'meeting agency' business together. Thus, Bennet BTI is becoming more than a travel agency, just like BP is claiming that it is becoming an energy provider rather

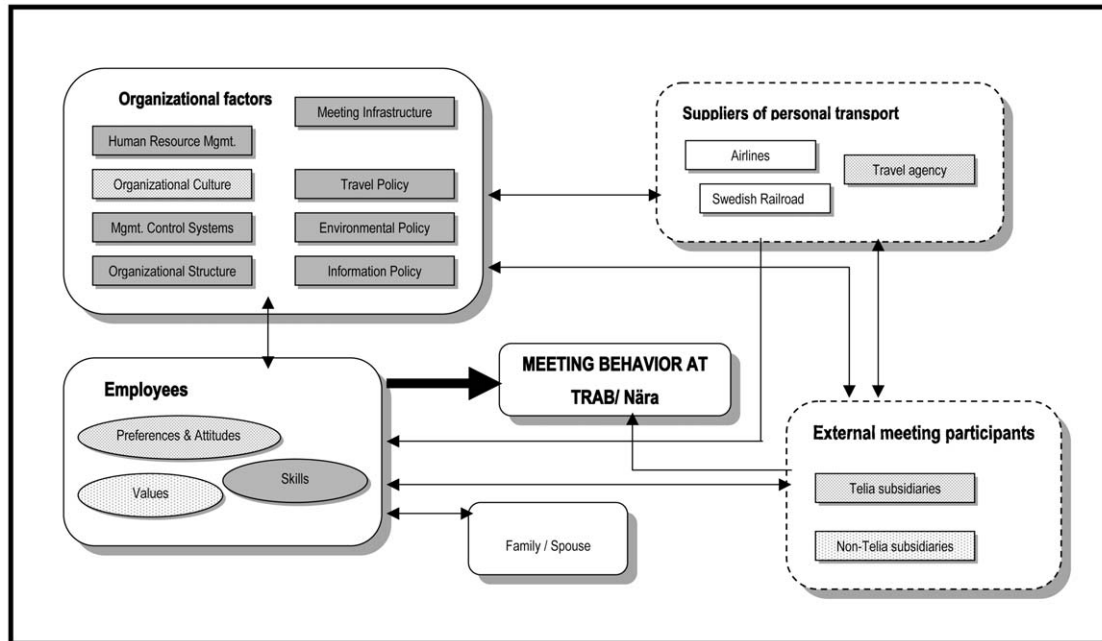


Fig. 3. A model of contextual factors for meeting behavior at TRAB/Nära, highlighting factors that can be manipulated by the TRAB/Nära management. The darker shade is used for factors that the management can change directly, the lighter shade is used for factors that can be indirectly manipulated by the management.

than only a supplier of petroleum products. This is an interesting new trend of product-services provision.

#### 8.7. Lack of 'meeting proficiency'

A last general reflection is the casual way that meetings are sometimes planned and undertaken, leading to many meetings being ineffective in terms of the time and resources. A quote from the Nära survey underlines the lack of meeting proficiency: "Most often the '[going to a meeting] in vain'—feeling is more related to poor preparations, expectations and structure. In those cases, many meetings feel like a waste of time, and if long traveling is involved, this feeling is, of course, emphasized, in respect of time consumption, expenses, and waste of time".

Even though it may seem like a far cry from environmental management, indications are that a better culture of meeting management could lead to more effective meetings, reducing the number of meetings and thus, the need for business travel. It should also be noted that effective preparation and meeting management are of even more importance in a virtual meeting, since the media may restrict the possibilities to improvise solutions e.g. for sharing documents and slide shows.

#### 8.8. Family influence

A driver for virtual meetings was found to be related to the family situation, as particularly employees with small children were reluctant to travel frequently to

meetings. Another group of employees that favored virtual meetings were frequent travelers, who expressed weariness for traveling back and forth to the company's main office. However, the most frequent travelers, persons involved in sales and procurement, were little inclined to approach the virtual meeting tools, which may be explained by their high degree of external contacts. Environmental concern could not be linked to an interest for virtual meetings, even though a majority of the employees expressed a feeling that environmental issues were important.

#### 8.9. Attitudes to virtual meetings—'second class'

An interesting barrier related to individual preferences and attitudes was a prevailing hesitancy, particularly among many TRAB employees, about whether it is appropriate to meet e.g. customers virtually, an indication that virtual meetings were sometimes perceived as less significant, or second class meetings. External meeting participants could also represent a barrier, as well as a driver, depending on their attitudes, and skills etc. in their role as meeting initiators. The meeting infrastructure of external meeting participants was indicated to be a barrier (lack of access to equipment), but it was difficult to assess how significant this barrier was, as virtual meetings, other than telephone conferences, were found to be very rare and the option was seldom discussed.

### 8.10. The success of audioconferencing at Nära

The use of audioconferencing and to some extent Net-Meeting, has been very successful in Nära. The extensive use of audioconferencing is so notable that it is used by the Telia group as an example of good-practice for the environment.<sup>5</sup> The wide-spread application justifies a closer look at the prevailing conditions at Nära that have made this development possible. A number of factors are of vital importance in explaining the achievement. First of all, the managers in Nära, particularly, the information manager has actively promoted audioconferencing. The top management has sent directives to the Nära employees advocating the use of audioconferencing and also served as models by using telephone meetings combined with NetMeetings for several key meeting functions. It could be mentioned that, in turn, a major reason for promoting this meeting form has been because of strong directives from the Telia HQ to limit travel within the entire company group. However, the personnel at the HQ often call to meetings at their premises in Stockholm, expecting employees from different offices around the country to visit the office, as illustrated by the Nära quote: “the management at the HQ are experts in calling to physical meetings, even if it only is a one to two hour meeting. The lack of experience [in managing audioconferences] becomes clearly evident when someone suggests that s/he can join by telephone. They consider it as troublesome and the next time, they call someone situated in Stockholm to the meeting instead”.

Moreover, meetings in the Nära line organization are scheduled far in advance and the contents planned in detail. In addition, the form of the meeting is suggested, i.e. if it should be an in-person meeting or a virtual meeting. This improves the possibilities to utilize optimized types of meetings for specific meeting purposes. It also gives the participants a chance to prepare presentations, discussion topics and not the least themselves, for a specific form of meeting.

### 8.11. Audioconferencing vs. videoconferencing

In both the companies, but particularly at Nära, audioconferences were used more frequently than videoconferences. The technical infrastructure supporting both kinds of media is in place, but higher accessibility to conference telephones, simpler use, less or no need for booking, and higher reliability, may all have contributed to that the employees preferred telephones to videoconf-

erencing. Another crucial aspect is that the support and advocacy that audioconferencing enjoys from the Nära management, is on the contrary almost non-existent for videoconferencing.

## 9. A suggested approach for the realization of the environmental and financial promise of virtual meetings

There is a need to include a range of different types of expertise in the development and implementation of a strategy for optimal meeting. This expertise may include the IT department, the financial department, the corporate controller staff, the human-resource department, the information department, the environmental coordinator and representatives of the users. Only by including representatives responsible for the different contextual factors, it will be possible to manipulate those factors, to remove barriers and to introduce or reinforce drivers for virtual meetings. It should be noted that the modifications required within each of these factors do not need to include any fundamental changes.

An analysis of current meeting behavior is critical in the study of how to change an organization's meeting behavior and suggestions for improvements should be directly based on an understanding of the organization; each of the contextual factors and if and how the contextual factors are drivers or a barriers for virtual meetings.

There is a need to understand the specific situation of the organization before one proceeds into the design and implementation of the process to replace or partially replace some business travel with virtual meetings. Nevertheless, while our research cannot give a definite answer to what measures will be effective for increasing the substitution of business travel by virtual meetings in each particular case, it highlights some of the drivers and barriers that can influence the process, and it provides a general approach for addressing the issues that are applicable in any organization.

The methodology developed for these case studies was designed for initiating a process of change within a company. It was intended to answer the following questions, the answers to which we consider essential for the development and implementation of a successful strategy for optimal meetings.

1. What characterizes the current meeting behavior within the organization? What are the needs of the users, and is there a potential to substitute some of the physical meetings with virtual meetings?
2. Which contextual factors influence this behavior—what are the most important drivers and barriers for virtual meetings for the managers and employees within the organization?

<sup>5</sup> The information manager who has been a major driving force in the use of audioconferencing recently received Telia Nära's annual environmental prize for his efforts and success in replacing business trips with audioconferences and NetMeetings. Telia's Environmental Report 2000 also brings up audioconferencing at Nära as a good example.

3. Which of the relevant contextual factors can be influenced by the organization?
4. Who do we need to involve to influence the factors that can be manipulated?
5. What measures should be implemented to influence the factors in order to reinforce the drivers and overcome the barriers for virtual meetings?

### 10. Some reflections on the research approach

One of the effects of performing action research in an organization is that researcher's presence and the study actually affect the organization while one is studying it. This was seen in the case of TRAB and Nära.

It is perhaps, best illustrated by the fact that the study at Nära is a direct result of the study at TRAB. But it is not just another study, this time the case study is part of a much larger project, and while we, as researchers, have the opportunity to take an active part in this project, it is completely owned and driven from within organization. The role of the IIIIEE researchers is not only to lead a research project but also to provide support and guidance throughout the process of change within the case company.

The commitment to optimal meetings, within Telia is illustrated by the fact that a high ranking internal project manager has been assigned to the task of running this project, and the inclusion of a wide range of key representatives in the project's steering committees from corporate management as well as the management of Nära and TRAB. The project is, in effect, designed according to the recommendations that were generated from the TRAB study.

In addition, we have seen effects in terms of an increased awareness of the environmental implications of travel and increased interest in the available alternatives. This can be noticed particularly among the people that have been directly involved in the projects, but also among other employees that have come in contact with the project through its surveys, interviews and workshops. To what extent this will contribute to a change of meeting behavior is difficult to estimate, but we have seen that the project management has taken a conscious decision to optimize the project related meetings. In

practice, throughout this research we have 'walked the talk' and held most of our project meetings by virtual means.

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