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# Adoption of Communication Media in Virtual Organisations - Case Evidence of Structural Dilemmas

Kai Riemer

*University of Münster*, [kai.riemer@sydney.edu.au](mailto:kai.riemer@sydney.edu.au)

Nadine Vehring

*University of Muenster*, [nadine.vehring@ercis.de](mailto:nadine.vehring@ercis.de)

Stefan Klein

*European Research Center for Information Systems (ERCIS), University of Münster*, [stefan.klein@ercis.de](mailto:stefan.klein@ercis.de)

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# ADOPTION OF COMMUNICATION MEDIA IN VIRTUAL ORGANISATIONS – CASE EVIDENCE OF STRUCTURAL DILEMMAS

Riemer, Kai, European Research Center for Information Systems (ERCIS), University of Münster, Leonardo-Campus 3, D-48149 Münster, Germany, kai.riemer@ercis.de

Vehring, Nadine, European Research Center for Information Systems (ERCIS), University of Münster, Leonardo-Campus 3, D-48149 Münster, Germany, nadine.vehring@ercis.de

Klein, Stefan, European Research Center for Information Systems (ERCIS), University of Münster, Leonardo-Campus 3, D-48149 Münster, Germany, stefan.klein@ercis.de

## Abstract

*Communication technology is a field of significant innovation: at a fast pace new systems are being introduced in the market. At the same time, advances in ICT drive the emergence of new organisational forms such as the virtual organisation (VO). The VO is regarded a concept that provides firms with the necessary flexibility in changing markets. Modern ICT, i.e. communication systems and tools, is seen as the basis for work in the VO, where people with different competencies come together in short-term projects to exploit market opportunities. Yet the contingencies of adoption and use of communication systems in complex organisational environments are only poorly understood. While literature claims that modern ICT is at the heart of the VO, our case evidence paints a different picture – only very lean media are used. We analysed communication practices at the group level using genre analysis. This leads us to formulate inherent dilemmas of the VO: Ultimately, it is the very structures of the VO that impede the emergence of communication practices and thus the adoption and diffusion of new ICTs.*

*Keywords: Communication systems, adoption, virtual organisation, distributed work, virtual teams.*

# 1 INTRODUCTION

Information and communication technology (ICT) is a field of significant innovation: As the convergence of IT and CT is finally progressing, new systems or combinations of systems have been introduced in the market at a fast pace (Riemer, 2007); integrated web conferencing or real-time communication systems are prominent examples (Riemer and Frößler, 2007). Some of the systems vendors argue – in line with their economic interests – for extended services (and richness of the media) based on a “more-is-better” logic. At the same time we witness profound organisational changes in a move towards the virtual organisation (VO) with its flexible, geographically dispersed, often mobile, ICT-enabled work environments. Inherently tied to the notion of VO is the idea of ICT support: ICT is seen as the key enabler of VO by most scholars in the domain, yet it is most often treated quite generically. Those who take a differentiated view see a need to support collaborative work in VOs with rich media and sophisticated communication systems (e.g. Shin, 2004; Thorne, 2005).

However, our understanding of the (contingencies of) adoption and use of communication systems within VOs is very limited. While the VO literature claims that modern ICT is at the heart of the VO, the empirical evidence presented in this paper paints a different picture. In this qualitative case study research we investigate communication practices in a subsidiary of a large multi-national firm in order to gain a better understanding of the use of communication media in VOs. Our case resembles the typical structures associated with a VO, i.e. the distinction of a long-term pool of competencies and the flexible configuration of short-term projects, organised in a geographically dispersed manner.

The contribution of our study is threefold. Firstly, we aim to improve our understanding of the role of ICTs and ICT-based communication practices within virtual organisations. So far, the VO has largely been portrayed on a structural level; little knowledge exists with regards to the actual VO work practices (i.e. on the group level) or the application of particular types of ICT for that matter. We analyse communication genres and media use on the project/group level in our VO case. Quite surprisingly, we find only very limited ICT support – only email and (mobile) phones are consistently used throughout the organisation. Several initiatives to introduce more sophisticated ICTs have failed or yielded only very isolated results. We investigate reasons for this apparent lack of adoption. Consequently, the second contribution of our study is to better understand the adoption of communication media in complex organisational settings (such as the VO). Our results lead us to argue that it is the very structures of the VO itself – flexibility, short-term nature of projects, fluidity, mobility, geographical dispersion – that hamper or impede the adoption of communication systems. Using a practice lens we argue that communication systems exhibit interpretive flexibility that requires interpretation and appropriation in context in order to find their way into peoples’ work practices. The VO structure however creates an environment in which these practices do not easily emerge. Thirdly, we argue for a re-contextualisation of future adoption research; we need to better understand the situated nature of communication practices when investigating ICT adoption in complex organisational environments.

We begin by describing the VO concept and the role of ICTs in VOs (section 2), before we introduce the case setting (section 3). This is followed by a short overview of the empirical part of the study and the data collection methods (section 4). Section 5 introduces the communication practices and points out differences in pool and project, while section 6 gives an overview of media use and describes recent initiatives to introduce new media. We find evidence of very lean media use; in section 7 we discuss the reasons for this apparent lack of adoption and point out structural dilemmas of the VO setup.

## 2 VIRTUAL ORGANISATIONS

Virtual Organisations (VOs) are regarded as the appropriate organisational response to turbulent markets that provides companies with flexibility and agility. However, the term ‘virtual organisation’ is somewhat vague and obscure; many slightly different interpretations exist in the literature.

## 2.1 Different types of VOs

Most generally, two approaches to defining the VO can be identified (Franke, 2001; Kasper-Fuehrer and Ashkanasy, 2004): The first one sees the *VO as a type of organisational network*, “as a cooperative partnership (...) of independent economic actors that join forces on a temporary basis in order to achieve a common goal.” (Franke, 2001, 49) A VO thus is a network in which independent firms integrate their specialised expertise (Talukder, 2003). In this paper we focus on the second type of VO, which sees the VO as one *ICT-enabled corporation*, with headquarters in different countries whose employees communicate mainly through electronic means to overcome spatial dispersion (Shin, 2004). Hence, a VO is a geographically dispersed organisation whose workforce includes a significant proportion of remote or mobile workers (Bleecker, 1994).

## 2.2 Two-level VO structure – pool and projects

Moreover, the VO is typically associated with a two-level organisation structure: 1) a pool of competencies and 2) short-term projects configured from the pool (Wehmeyer and Riemer, 2007). The *pool* represents the long-term element of the VO and is interpreted as a portfolio of competencies (Tuma, 1998), from which *projects* are formed to swiftly exploit fast-changing market opportunities (Pihkala et al., 1999). This aspect of virtual organisation is called the switching principle (Mowshowitz, 1999); competencies are swiftly recombined to form projects of limited duration that are decomposed upon achieving their mission (Saabeel et al., 2002). The result is a high degree of flexibility in fulfilling customer orders (Franke, 2001). The downside however is also a high degree of volatility that is challenging for setting up, managing, and working in VO project teams (Riemer and Klein, 2008).

## 2.3 The role of ICT in the virtual organisation

ICT is at the heart of the VO concept: It is seen as an enabler for bridging space, time and cultural distances. Most VO authors stress the central role of ICT as a core instrument for communication and collaboration. A virtual organisation is seen as a collection of geographically distributed people who rarely meet in person, but who are linked by tools such as email, videoconferencing (Shin, 2004), groupware systems, electronic messaging and screen sharing systems (Franke, 2001). As Thorne puts it “virtual organizations are characterized by ‘cyber-technology-enabled working practices’ – telecommuting, shared desks, groupware and empowered virtual teams.” (Thorne, 2005, 583) Some authors also point to the mobility aspects interpreting the VO as being based on an “ultra-mobile workforce” that uses modern communication systems and devices (Bleecker, 1994). All in all, according to literature, VOs depend on effective collaboration between people enabled through technologies such as email, videoconferencing or more complex groupware systems that link people together for exchanging ideas or to meet in shared virtual spaces (Cohen and Mankin, 1999).

## 2.4 Summary of VO characteristics

Drawing on the above given introduction, the following key VO characteristics can be identified: The VO is a project-based organisation based on the principle of *switching and flexible reconfiguration* of competencies to *exploit opportunities in dynamic markets*; such projects often aim at developing *customer-specific solutions* and feature a *short- or medium-term planning horizon*. In doing so, VOs rely on a *geographically dispersed* and often *highly mobile workforce* with people working together in virtual teams that are heavily *supported by modern ICT*. Moreover, people often show *cultural diversity* due to the multi-national nature of the VO (Shin, 2004; Watson-Manheim et al., 2002).

### 3 THE CASE COMPANY INCOTEL

InCoTel (*name changed*) is a large multi-national electronics firm based in Europe. Its product portfolio ranges from telecommunications infrastructure over communications solutions (e.g. IP telephony) to various consulting services.

#### 3.1 Unit of analysis: the IAM group of security experts

Within InCoTel we focus on one particular business segment – the professional services and individual solutions (PSIS) segment, where communications technologies are developed and implemented as customer-specific solutions using project setups that strongly resemble the VO structure (see below). Within PSIS two types of divisions exist: first, a range of divisions focuses on the development of new products for different industries (e.g. Finance) and in various technological areas (e.g. Unified Communications). Second, several regional divisions are concerned with sales and the subsequent project-based development of customer-specific solutions. The organisational unit we had access to is located in the Germany regional division. Internally, this division is more or less divided into 1) a sales group, which manages the customer contact, 2) a solution centre, which holds project managers and administration people, and 3) two centres of competence (CoCs) with technical experts in the areas security and customer relationship management. Specifically, we had access to 21 employees, who form the identity and access management (IAM) sub group within the security CoC.

The IAM people are distributed across a range of 9 geographical sites located all over Germany, including the Munich headquarters of InCoTel. While people are assigned to one of the company sites as their home base they often travel and work at the client sites during project phases. The IAM group resembles a pool of security experts, who bring in their competencies on a case by case basis in projects with customers. In these projects the role of the CoC people is to support the sales personnel; i.e. they work as consultants or system integrators.

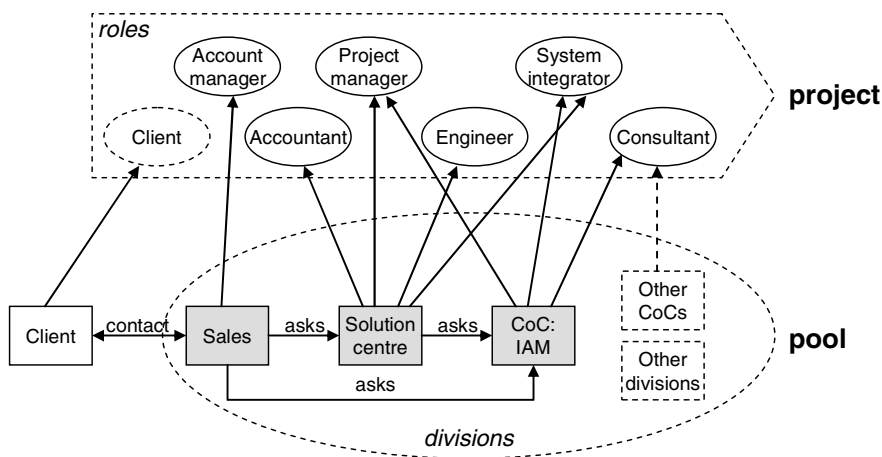


Figure 1: Configuration of customer-specific project from InCoTel pool of experts

#### 3.2 Pool and project at InCoTel

The way customer projects are organised within PSIS resembles the two-level structure of the VO as described in the literature: Projects are made up of people from different PSIS divisions including our focal team – the IAM group within the security CoC. Project initiation follows a stable pattern: The sales unit initiates the project; the account manager is the main contact person for the client. For a small project, sales might directly ask technical experts, e.g. members of the IAM group, to provide a project manager and technical consultants. In larger projects however, project managers, accountants

(for contractual questions), engineers (for business planning), and system integrators (for technical customising) are drawn from the solution centre, while the CoCs provide technical experts (as consultants or system integrators). In very large, technically complex projects personnel from other CoCs, other regions, or other technical divisions (e.g. the headquarters) are also integrated into the project, which leads to complex, multi-layered setups. Figure 1 visualises typical project roles and the way in which projects are set up. In this structure the sales division together with the solution centres and the CoCs function as a pool of experts with different backgrounds, from which, on a flexible and ad hoc basis, projects are assembled that are dissolved after a few weeks or months of project duration.

## 4 STUDY OVERVIEW

The results reported in this paper were gained as part of a larger study on communication practices in distributed work within InCoTel. More specifically, the data presented below was gathered as part of a communication analysis that aimed at documenting the communication genres and practices of the IAM group, as well as their current media usage behaviour. The underlying idea was to derive (organisational) recommendations for improving media use in distributed work within InCoTel. The IAM group was selected because of its model character and representativeness for distributed groups within InCoTel. Originally, we were approached by PSIS management with the idea to investigate the slow adoption of communication and collaboration systems (such as videoconferencing) within PSIS.

As already mentioned, for this study we had access to the 21 members of the IAM group, who are distributed across several geographical sites. As part of our communication analysis we aimed to describe the organisational context of this group, identify communication practices and media usage, as well as investigate why and how certain media are (or are not) being used by the group members. Consequently, we combined a range of data collection methods. First, we used *field observations* to get an in-depth understanding of the communication behaviour and media use. In doing so, we spent time with a sub group of five team members located at one office site. While this proved to be invaluable to gain an understanding of the context and certain parts of the members' communication, it quickly became clear that due to the flexible work arrangements this had to be accompanied by *semi-structured interviews* to gain a complete picture of communication and media usage. Third, to corroborate the interview results and to gain a more structured understanding of media usage, a *short survey* was distributed to all IAM members, which listed all available communication media and tools and asked for a self-assessment of how frequent each of them was used by the team members. Finally, the survey was followed up with *another round of interviews* to explore the reasons for these usage patterns.

In the following, we do not report on the whole study in rich detail, but draw on some parts for presenting our observation that the adoption and diffusion of media in the VO is indeed hampered by the very characteristics of the VO setup. We begin by briefly introducing the communication practices (and genres) in pool and project; these results are based on the observations and interviews. After this we sketch out media usage patterns within the IAM group (based on the media assessment survey) and present team members' reasoning about media use and adoption; the latter results stem from the second round of open interviews carried out after analysing the survey data.

## 5 COMMUNICATION IN POOL AND PROJECT

In the following we give a brief overview of the nature of communication on the pool level, i.e. among members of the IAM group, as well as on the project level, which represents the view of IAM group members being involved in a variety of projects within the PSIS division. In doing so, we present selected results of a genre analysis of IAM members' day-to-day communication, which has been recorded during observations and discussed in open ended interviews. Please note that it is not our intention to provide a full account of the genre analysis; we only present a summary of the communication genres (see table 1) and briefly discuss communication practices in order to describe how communica-

tion differs between pool and project. We begin by spelling out our practice theoretical understanding and by introducing genre analysis as a means to capture communication practices.

### 5.1 Genres as a means to structure and describe communication practices

Practices can generally be defined as a “routinized type of behaviour which consists of several elements, interconnected to one other: forms of bodily activities, forms of mental activities, things and their use, a background knowledge in the form of understanding, know how, states of emotion and motivational knowledge”(Reckwitz, 2002, 249). A practice understanding stresses the routinization of communication; with regards to technology a practice view directs researchers’ attention to the technology-in-use, i.e. the ways in which different people use technology in particular times and places (Orlikowski and Iacono, 2000). By routinely engaging with technologies in particular ways, people enact and re-enact a set of rules and resources (i.e. technology structure) which structure their interaction with that technology thus leading to emerging practices of technology use (Orlikowski, 2000). Hence, communication technologies are appropriated over time and become embedded in emerging and situated communication practices.

Genres have been recognised as a means to capture technology-enabled practices of communication; they are “socially recognized types of communicative actions [...] that are habitually enacted by members of a community to realize particular social purposes.” (Yates et al., 1999, 84) Genres are situated and rooted in a social context; they develop over time as a response to recurring communication situations. As such, they capture the ways in which people communicate. Communication genres emerge from social practices and in turn shape social activity by providing socially agreed upon templates that structure the communication (Kwasnik and Crowston, 2005). In doing so, a limited set of genres can describe the communication practices of a group; it acts as a form of repertoire on which group members routinely draw when they communicate with each other (Orlikowski and Yates, 1994). Hence, genres can serve as an analytical tool to understand the communication practices of a social group, because “in identifying and labelling genres we try to capture the gestalt of the various components of the communicative act.” (Kwasnik and Crowston, 2005, 80)

In order to identify genres, we need to specify how a genre can be recognized. What can be observed in a social context is the communication events people engage in during their daily routines. Conceptually, a genre is a class of communicative events, communication events in turn are instantiations of a genre (Swales, 1990). What “turns a collection of communicative events into a genre is some shared set of communicative purpose” (Swales, 1990, 46). Hence, purpose is the primary criterion by which to identify genres (Askehave and Swales, 2001). This purpose is recognizable for members of the discourse community (Swales, 1990). Consequently, while communication events can be observed, genres can be discussed and reflected on in open-ended interviews. Thus, we followed a two step approach: First we observed and recorded communication events; the resulting data was analysed and two sets of genres were identified for both pool-related and project-related communication. Second, the preliminary genres sets were discussed in interviews to arrive at agreed upon sets of genres. By comparing the genre repertoires on pool and project level we are able to pinpoint existing differences in communication practices.

### 5.2 Communication practices in pool and projects

Communication at the pool level can be characterised by a total of eight communication genres and is mainly concerned with information-sharing and group-related coordination (see table 1 for a full list of genres). The majority of events represented technical communication aiming at sharing knowledge and solving problems, e.g. arising from projects. For example, the genre *discussion of technical questions* is the most frequent one: members involved in projects need information from other IAM experts or have a technical question that is then being discussed; people might also *search for an information source*, i.e. when they do not know who can provide a certain piece of information.

Project communication is mainly concerned with coordination of project work and goal-driven collaboration on shared objects. For example, the often observed genre *time coordination* subsumes all communication regarding appointments and meetings. The majority of communication is task-related: The *joint project planning* subsumes communication in regards to formulating a plan, negotiating milestones etc., while another genre subsumes all communication with regards to *joint work on text documents*, mostly longer and complex interactions in which documents, e.g. technical specifications, are jointly written.

When comparing communication genres on the pool and project level some important differences come to the fore. Pool-level communication is to a large extent concerned with information sharing and, to a lesser extent, coordination, but does not comprise any interactions in regards to actual collaboration on joint objects. To the contrary, most communication on the project level is task-oriented and concerned with “doing something together”, that is working on joint documents or technical artefacts. Coordination does also account for a large amount of communication events. These differences have implications for the media and tools that are useful in the two contexts (see below).

<i>Group process / Genres in...</i>	<b>...pool</b>	<b>...project</b>
<b>Information sharing</b>	Discussion of technical questions Search for an information source General knowledge exchange Exchange of organisational information	Sharing of general project information
<b>Coordination</b>	Distribution of project tasks Group coordination	Project initiation Time coordination Distribution of work packages Coordination of task interdependencies
<b>Collaboration</b>		Joint project planning Joint work on text documents Technical customising
<b>Conflict resolution</b>	Escalation	Escalation
<b>Social communication</b>	Social talk	Social talk

Table 1: Comparison of communication genres in pool and project

## 6 MEDIA USE AT INCOTEL

In the next step we investigated current media use by the IAM members. To this end a survey was distributed. Since we wanted to get a complete overview of media use we distributed among all 21 members of the IAM group a short paper-based survey listing communication tools; 17 completed questionnaires were returned. In the questionnaire every piece of communication media or tool was listed that was accessible to IAM members and that served as a way for communicating either directly or indirectly. More precisely, we not only included typical media such as phone, instant messaging etc. but also tools such as document spaces or wikis that serve the purpose of exchanging information and can facilitate a form of indirect communication. For every tool on the list we asked the participants to provide an estimate of the frequency of usage.

### 6.1 Current media usage

The most obvious result of the survey is the fact that people most predominantly draw on email and (mobile) phones in their daily work (see table 2); email and mobile phone are the only media that are used on a daily basis by the whole group. Only a few other media/tools are also used quite frequently by a majority of IAM members, these are phone conferences, application sharing, document spaces and the mailing list. Other media such as video conferences (i.e. desktop conferences accessible from the desktop computer), instant messaging and wikis are hardly used by any of the IAM members.



When individuals see an immediate need to communicate (e.g. to access urgent information or for ad hoc project coordination) they routinely draw on the phone. Because they are dependent on their mobile phone when travelling, individuals routinely draw on the mobile even when in the office (one reason is that numbers are stored in the mobile phone contact list). Also, people tend to carry their mobile phones at all times, e.g. over lunch, in order to be accessible. Email on the other hand is used whenever communication needs documentation, e.g. for liability reasons. Email is by far the main medium for distributing documents (sent as attachments); individuals tend to not use the document spaces for this purpose. Also, appointments are arranged using email (time coordination).

Because a policy exists to use document spaces in order to document project progress and for archiving knowledge, project members often name one person who has to update the document space with project-related materials. However, document spaces are hardly ever used as part of daily work practices. This is largely attributed to issues of time pressure (email is faster) and mobility (no access when travelling). Sometimes group members draw on the spaces to get information on past projects.

	Mode of communication	Often (more than once a week)	Medium (more than once a month)	Seldom (one or more times a year)	No use	Missing values
1	Face to face	29%	53%	18%	0%	0%
2a	Phone (office)	65%	18%	0%	18%	0%
2b	Voice box (office)	6%	24%	29%	41%	0%
3a	Mobile phone	100%	0%	0%	0%	0%
3b	Voice box mobile	76%	18%	0%	0%	6%
4	Phone conference	29%	59%	12%	0%	0%
5	Video conference	6%	6%	41%	47%	0%
6	Application sharing	12%	53%	35%	0%	0%
7	Instant Messaging	12%	24%	18%	47%	0%
8	eMail	100%	0%	0%	0%	0%
9a	Doc space read	18%	59%	24%	0%	0%
9b	Doc space write	18%	41%	12%	24%	6%
10a	Wiki read	12%	12%	47%	29%	0%
10b	Wiki write	0%	24%	6%	65%	6%
11a	Mailling list read	59%	35%	6%	0%	0%
11b	Mailing list write	12%	24%	65%	0%	0%

Table 2: Frequency of use of communication media and tools by IAM members

For group communication individuals prefer face to face meetings. However, due to the distributed nature of work settings, most often they use phone conferences. Phone conferences do not require any special infrastructure compared to video conferences and people can also initiate and participate using mobile phones, e.g. while driving in the car. These conference calls are used for project status meetings or to discuss technical issues on the pool level. In addition, simple application sharing is sometimes used for working together on a document or a technical artefact, while at the same time communicating over the phone or in a phone conference. This seems to be a well accepted work practice, which however is not acted out on a weekly basis by most of the group members.

While these media and tools almost comprehensively describe the daily media use of the IAM members, some of the available media and tools are hardly used at all, even though recent initiatives tried to promote the use of systems such as video conferencing, instant messaging and wikis.

## 6.2 Initiatives to promote new communication systems

A few months ago, PSIS management saw the need to promote the roll-out of video conferencing, or more precisely of a web conferencing system, in order to better facilitate collaboration and team building in projects, where project members quite often do not know each other at the beginning. As a first step, the web conferencing system was used on a bimonthly basis to conduct virtual meetings at the

middle management level where virtual sessions replaced some of the physical leadership meetings. However, actual usage of the system did not live up to the initial hopes that system use would spill over to the IAM group and also to the project contexts. In our interviews, IAM members attributed the lack of web conference usage mainly to two factors – 1) technical hurdles in initiating a web conference session and 2) little added value as compared to phone communication.

For conducting web conferences individuals need a web camera and for initiating a session one has to first login to the system, then create a session and send an email with invitations and a web link to all participants. In the day-to-day work these steps turn out to be too cumbersome. All interviewees found it too time consuming to initiate a session; being under time pressure people rather turned to setting up a phone conference, which is much faster and also done routinely by most IAM members. Moreover, when travelling, people lack the necessary infrastructure to enter a video conference. While they can still participate via phone, the added benefit is lost. In regards to this added value IAM group members more or less told us that they are comfortable using the phone in most situations. When a richer medium is needed, e.g. at the beginning of projects, they prefer face to face meetings. Hence, web conferences are perceived as ‘nice to have’, but did not make their way into the group’s work practices.

Another initiative is concerned with promoting the use of instant messaging in both IAM group and the projects in the PSIS context. Instant messaging is available to all employees in the division for testing and usage. Consistent with the literature the idea is to improve accessibility in the virtual context (immediacy of communication) and to ensure a better flow of information (Nardi et al., 2000). However, most individuals did not use the system so far; within IAM current usage is restricted to a small sub group. Being confronted with this lack of adoption it turned out that most people had deliberately refrained from using the system, albeit for varying reasons (see table 3).

Time Pressure	People did not use/test the system, because it is too time consuming. Typing in a message is too time-consuming; people rather call someone over the phone. Incoming messages are interrupting when working on the computer, since people feel they are obliged to answer straight away (which runs counter to working under pressure).
Mobility	When travelling, people don’t have access to the system.
Reliability	The presence status indicating that people are available is unreliable. Hence, people try calling others over the phone anyway.
Media richness	People report a higher likelihood of misunderstanding as in phone conversations.

Table 3: *Reasons for not using instant messaging*

A third initiative promotes the use of wikis; it was started by some members of the Munich office in order to create a central knowledge container for IAM members. The idea of the wiki is to collect experiences with regard to past projects, solving typical problems, or important product news. However, active use of the tool is still restricted mainly to the Munich sub group. While some individuals tend to draw on the wiki to look for information, only few people actively join in writing (see table 2). Reasons for this can again be attributed to time pressure, but also to a critical mass problem (see table 4). Interestingly, all indirect communication tools (wiki, but also document spaces, mailing list) are only used very infrequently by the group members. A reason for this also lies in the reported importance of personal contacts and existing practices for accessing information; people turn to contacting other people by phone whenever they need to know something.

Time Pressure	Writing wiki articles is too time-consuming during day-to-day work. People cannot bill time spent writing wikis on a project; no direct incentive to contribute. People have to fill other databases (document space) with project information, so that they do not see the need to spend more time maintaining “redundant” information stacks.
Critical mass	There is currently not enough information in the wiki for people to use it.
No clear strategy	The wiki has not been endorsed by management; hence, people tend to wait. Multitude of information storages: people do not know on which information sources to draw when searching for information; hence they draw on personal contacts.

Table 4: *Reasons for not using the wiki*

## 7 DISCUSSION

Having reported on the media usage patterns of the IAM group members and on the reasons for not adopting newer or more advanced technologies, in this section we discuss these findings against the backdrop of the virtual organisational setup and its characteristics introduced in section 2.

One of the most prominent reasons for not using or even testing new communication systems is the time pressure experienced by group members working in the VO case setup. People are often involved in a multitude of projects at the same time with the pressure to bill as much time as possible to these client projects. At the same time they are also part of a group of people (the pool) who need to exchange knowledge and to keep up to date with the latest technological trends. In situations of time pressure individuals have little interest in testing out new tools, especially when they do not see the immediate benefits. The high amount of travelling and working at client sites further increases time pressures and also impedes the use of certain tools due to a lack of infrastructure when travelling. Moreover, well established practices of phone communication and accessing knowledge through personal networks exist; direct media such as phones are being used to get information and not groupware tools or wikis. Established practices often hinder the emergence of new ones (Wenger, 1998). This is aggravated by both the fact that most communication systems need to become part of social practices and the fact that communication in pool and projects is fundamentally different.

Communication systems, such as web conferences or instant messaging, are open, general purpose systems that need to become part of shared social practices to unfold their full potential (Orlikowski and Iacono, 2000); typically, their potential cannot be derived from their set of features (Riemer et al., 2007). Rather, these systems need to be appropriated by people in context (Orlikowski, 2000). Moreover, many systems need to exceed a critical mass of usage in order to be used effectively (e.g. wikis or instant messaging). This requires adoption on the group level by way of the emergence of shared practices. For doing so, group members need time to experiment with new tools and a shared social context in which situated practices and norms for using tools can emerge (Wenger, 1998).

While in a project context, certain communication systems might indeed be useful, e.g. web conferencing for team building or instant messaging for ad hoc coordination, practices of using these systems do not easily emerge in VO projects. A short-term project, staffed with people from different backgrounds, who also work in a distributed fashion, does not resemble the ideal environment for the appropriation of communication systems and the proliferation of joint practices of using systems. According to the flexibility argument, in VO projects people come together swiftly. Consequently, they do not work together long enough in stable structures (i.e. a shared social context) to invest in joint practices. In combination with time pressure, this environment does not lend itself to the natural emergence of new communication practices. Only little time exists to experiment with new tools; initial learning does not happen, practices as a result of organisation/social learning do not emerge. What is more, such practices also do not emerge on the pool level. While people in their divisions (e.g. within IAM) share a social context and a long-term perspective, new practices of using systems, which might be useful for a project context, do not emerge, because people simply do not need them in the pool. As discussed above, communication needs can be very different. Since on the pool level group processes are not concerned with collaboration and the same amount of coordination, people are not in the situation to build out shared practices of using tools that might later be useful for project contexts.

Consequently, our main argument is that typical VO structures create an environment in which social practices of using new communication systems cannot emerge naturally, which impedes the adoption of these tools. This leads us to formulate an inherent dilemma of virtual organisation: While new ICTs are supposed to support people working in virtual organisations, it is the very structures of the VO that impede the diffusion and adoption of new ICT. In such a context people draw on established practices of communicating, e.g. by using lean media such as email or phone. These existing practices (habits) are strong enough not to be abandoned unless individuals see immediate gains straight away without having to experiment with new tools.

A second VO dilemma, which stems from the two-level structure, concerns the promotion of change: While line managers, at the division or pool level, might see the need (and also have the budget) to introduce new media and tools (as was the case at InCoTel), they are in a weak position to initiate and drive the adoption of such ICTs. Line managers can hardly initiate the use via the pool level since communication here does not require those systems (see above). And in projects there is little time and incentive to invest in new practices of tool-based communication. Our interviewees reported that, while sometimes project managers required people to use novel ICTs (with mixed success), tool-usage did not spill over to the pool level. Generally, practices are socially situated and can hardly be copied or transferred. Hence, individuals, when moving to a new project context, are not able to draw on practices (of tool usage) acquired in other contexts.

## 8 CONCLUSION

The dominant view in the VO literature sees modern ICTs at the heart of virtual work. Yet the notion of ICT is rather generic. In this study we analysed in detail the communication practices in a VO case example. The structures found at InCoTel resemble almost exactly the VO blueprint, featuring a two-level structure of pool and project. To our surprise we found only very lean media usage in day-to-day communication. We investigated the reasons for this apparent lack of adoption of more sophisticated ICTs. Our analysis leads us to point out two dilemmas in the VO structural setup with regards to communication systems adoption: First, while modern ICTs are supposed to enable VO, it is the very structures of the VO that hamper the diffusion and adoption of new communication systems. The VO concept, on the group level, leads to structures that impede tool appropriation and the emergence of the necessary communication practices. Second, line managers on the pool level, with the initiative and necessary budget to introduce new ICTs, face the challenge of driving the diffusion of tools aimed at improving collaboration on the project level for which practices do not emerge on the pool level. And even if tools are promoted and cautiously tested on the pool level (in a sub group of the company such as IAM), in projects, with people coming from all parts of the organisation, people turn back to the smallest common denominator for communication, i.e. email and (mobile) phones. New, more complex tools are not adopted; diffusion does not happen.

Our study points to a need for more contextualised research approaches for understanding the adoption of communication media in (complex) organisational setups such as the virtual organisation. We claim that the social context has to be considered in order to capture the situated nature of communication practices. In order to understand adoption (or the lack of adoption) in a professional environment we carried out an analysis of communication practices at the group and task level, embedded in a broader organizational analysis. Such an organisational analysis provides insights into the interplay of organisational structure, existing practices, peoples' perceptions of tools and actual adoption and usage patterns. We see our study as part of a stream of research investigating media adoption from a practice theoretical perspective. We argue for a re-contextualisation of communication analysis: Understanding communication practices requires a more refined understanding of communication events, their temporality, sequence, complexity etc. Communication is not just a simple and isolated act, rather it is typically embedded in criss-crossing networks of relationships and different modes (and contexts) of work. We used genre analysis and communication genres to grasp the unique and situated nature of communication in our case. More studies are needed to replicate our analysis in other contexts.

## References

- Askehave, I. and Swales, J. M. (2001) *Genre identification and communicative purpose: a problem and a possible solution*, *Applied Linguistics*, 22 (2), pp. 195-212.
- Bleecker, S. E. (1994) *The Virtual Organization*, *The Futurist*, 2, pp. 9-14.

- Cohen, S. G. and Mankin, D. (1999) *Collaboration in the Virtual Organization*, In Trends in Organizational Behavior - Volume 6: The Virtual Organization (Eds, Cooper, C. L. and Rousseau, D. M.) John Wiley & Sons, Chichester et al., pp. 105-120.
- Franke, U. (2001) *The Concept of Virtual Web Organisations and its Implications on Changing Market Conditions*, eJoV - the Journal for Networks and Virtual Organizations, 3 (4), pp. 43-64.
- Kasper-Fuehrer, E. C. and Ashkanasy, N. M. (2004) *The Interorganizational Virtual Organization*, International Studies of Management & Organization, 33 (4), pp. 34-64.
- Kwasnik, B. H. and Crowston, K. (2005) *Introduction to special issue: Genres of digital documents*, Information Technology & People, 18 (2), pp. 76-88.
- Mowshowitz, A. (1999) *The Switching Principle in Virtual Organization*, eJoV - the Journal for Networks and Virtual Organizations, 1, pp. 6-18.
- Nardi, B. A., Whittaker, S. and Bradner, E. (2000) *Interaction and Outeraction: Instant Messaging in Action*, Computer Supported Cooperative Work, Philadelphia, pp. 79-88.
- Orlikowski, W. J. (2000) *Using technology and constituting structures: A practice lens for studying technology in organizations*, Organization Science, 11 (4), pp. 404-428.
- Orlikowski, W. J. and Iacono, C. S. (2000) *The Truth is Not Out There: An Enacted View of the "Digital Economy"*, In Understanding the Digital Economy (Ed, Brynjolfsson, E.) MIT Press, Boston.
- Orlikowski, W. J. and Yates, Y. (1994) *Genre Repertoire: The Structuring of Communicative Practices in Organizations*, Administrative Science Quarterly, 39, pp. 541-574.
- Pihkala, T., Varamäki, E. and Vesalainen, J. (1999) *Virtual organization and the SMEs: a review and model development*, Entrepreneurship & Regional Development, 11 (4), pp. 335-349.
- Reckwitz, A. (2002) *Towards a Theory of Social Practice: A Development in Culturalist Theorizing*, European Journal of Social Theory, 5 (2), pp. 243-263.
- Riemer, K. (2007) *The Market for E-Collaboration Systems - Identification of Systems Classes using Cluster Analysis*, 15th European Conference on Information Systems, St.Gallen, June 7-9, 2007.
- Riemer, K. and Fröbller, F. (2007) *Introducing Real-Time Collaboration Systems: Development of a Conceptual Scheme and Research Directions*, Communications of the Association for Information Systems (CAIS), 20, pp. 204-225.
- Riemer, K., Fröbller, F. and Klein, S. (2007) *Real Time Communication - Modes of Use in Distributed Teams*, 15th European Conference on Information Systems, St.Gallen, 07-09 June 2007.
- Riemer, K. and Klein, S. (2008) *Is the V-form the next generation organisation? An Analysis of Challenges, Pitfalls and Remedies of ICT-enabled Virtual Organisations based on Social Capital Theory*, Journal of Information Technology (JIT), 23 (3), scheduled for publication.
- Saabeel, W., Verduijn, T., Hagdorn, L. and Kumar, K. (2002) *A model of virtual organisation: a structure and process perspective*, Electronic Journal of Organisational Virtualness, 4 (1), pp. 1-17.
- Shin, Y. (2004) *A Person-Environment Fit Model for Virtual Organizations*, Journal of Management, 30 (5), pp. 725-743.
- Swales, J. M. (1990) *Genre Analysis: English in academic and research settings*, Cambridge et al.
- Talukder, M. I. (2003) *The Perception of Professionals and Management Personnel on the Virtual Organization*, The Journal of Computer Information Systems, 43 (3), pp. 92-99.
- Thorne, K. (2005) *Designing virtual organizations? Themes and trends in political and organizational discourses*, Journal of Management Development, 24 (7), pp. 580-607.
- Tuma, A. (1998) *Configuration and coordination of virtual production networks*, International Journal of Production Economics, 56/57, pp. 641-648.
- Watson-Manheim, M. B., Chudoba, K. M. and Crowston, K. (2002) *Discontinuities and continuities: a new way to understand virtual work*, Information, Technology & People, 15 (3), pp. 191-209.
- Wehmeyer, K. and Riemer, K. (2007) *Trust-Building Potential of Coordination Roles in Virtual Organizations*, Electronic Journal for Virtual Organizations and Networks (eJOV), 8, pp. 102-123.
- Wenger, E. (1998) *Communities of Practice: Learning, Meaning, and Identity*, Cambridge University Press, Cambridge, UK.
- Yates, Y., Orlikowski, W. J. and Okamura, K. (1999) *Explicit and Implicit Structuring of Genres: Electronic Communication in a Japanese R&D Organization*, Organization Science, 10 (1), pp. 83-103.