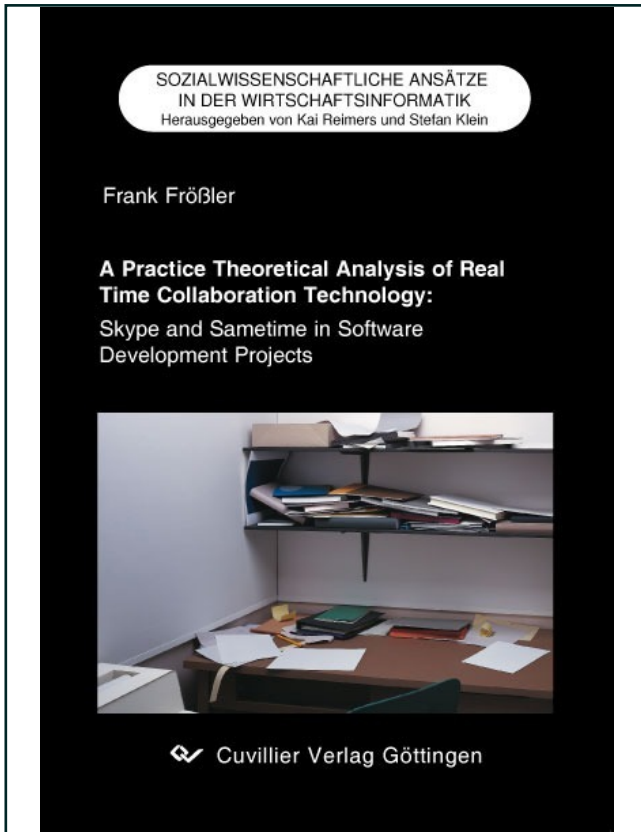




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**A Practice Theoretical Analysis of Real Time Collaboration  
Technology:**

*Skype and Samesite in Software Development Projects*



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# Chapter 1

## Introduction

Real-time collaboration (RTC) technology stands for a newly emerging genre of communication and collaboration systems which resulted from market convergence of the telecommunications and groupware market (Riemer et al. 2007a). Technology providers in the RTC market are currently pursuing two strategies which are partly overlapping. First, established providers from the telecommunication market (for example Alcatel, Cisco, Nortel, and Siemens) and traditional software companies (for example Microsoft, Oracle, IBM) are offering complex RTC solutions (cf. Elliot et al. 2005; Mohamed 2007). Such companies try to offer applications which encompass voice, instant messaging, presence status, e-mail, and audio/video conferencing. Most of the players are concentrating their efforts on their core capabilities and complement their service portfolio through the formation of partnerships and alliances (Burton et al. 2007; Musich 2007). Nortel is teaming up with Microsoft and IBM is partnering with Siemens, Avaya and Cisco Systems (Yedwab 2007). However, some of the established providers and also new competitors, such as Skype or Gizmo Project, are pursuing a second strategy and offering simple stand-alone applications which generally provide integrated VoIP communications, instant messaging, status information and conferencing (Lazar 2006). However, some of these formerly stand-alone applications, like Lotus Sametime, which started out as IM tools, have been revamped over time and resemble more and more complex and integrated RTC systems.

Irrespective of the scope of services offered by an application, RTC products contain at least one of the following four characteristics (Riemer et al. 2007a). First, unified communication refers to the integration of various information and communication channels, such as e-mail, telephone, instant messaging, or SMS (cf. Minifie 2007; Mohamed 2007). Second, the status information can give pre-dialling someone information on whether and how the person wants to be reached (Jennings 2006). Like in IM applications, the status information is provided in form of a buddy list. Third, contextualisation refers to the integration of RTC with existing information

systems, such as CRM or ERP. Users can initiate a communication act immediately from the software application in use. Finally, RTC applications can comprise features of groupware applications, such as team calendars or file sharing.

In the following, I shall limit the investigation to stand-alone applications, namely Skype<sup>TM1</sup> and Sametime<sup>TM2</sup>. To present a brief outline of stand-alone applications, I will succinctly describe the set of features offered by Skype (Riemer et al. 2007b; Riemer et al. 2007c). First, users can generate a *buddy list*, which is well-known from other instant messaging applications, by sharing their user ID. The buddy list shows the status information for every contact and access is generally limited to the members of the contact list. Second, Skype provides *one-to-one chat* and *group chat* functionalities, i.e. text based multi-person conferences. Text conversations can be archived and chat histories are retrievable to all chat participants even after closing the chat windows. Furthermore, chats can be bookmarked which allows re-opening of chat conversations. Third, the *VoIP functionality* provides the opportunity to place free voice or video calls to other Skype users and to initiate conference calls. Moreover, Skype allows users to place calls to (SkypeOut) and to receive calls from (SkypeIn) traditional landlines or mobile phones. Skype charges a fee for the two services as it also does for the voice box and call forwarding to landline or mobile phones. Finally, Skype allows users to customize parts of the application. For example, users can set up a personal profile and display to other authorized Skype users of the buddy list a photo, postal address, phone number, date of birth, a personal homepage, and a short personal message that is shown as a speech bubble. Furthermore, hot keys, sounds, or ring tones can be configured by the users.

The business press and technology evangelists alike are bullish about both the future growth of the RTC market and the impact the technology will have in organisations. They say that the “era of unified communications is here” (Rybczynski et al. 2005) and argue that UC and instant messaging (IM) already are or at least will prove to be equally successful in organisations than e-mail was in the 90’s (cf. Caton 2006; Hutton 2001). Gartner, the technology research and advisory company, predicts that by 2011, IM “will be the de facto tool for voice, video and text chat with 95 percent

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<sup>1</sup> Skype is a trademark of Skype Limited. Skype is registered in the United States Patent and Trademark Office, and with the Trademark Offices of the countries of Australia, Finland, Benelux, Hong Kong, Israel, Japan, Liechtenstein, New Zealand, South Korea, Switzerland, and Taiwan.

<sup>2</sup> Sametime is a trademark of International Business Machines Corporation in the United States, other countries or both.

of workers in leading global organisations using it as their primary interface for real-time communications by 2013” (Gartner 2007). Furthermore, Gartner forecasts the RTC market to grow from \$267 million in 2005 to \$688 million in 2010. Other surveys report that 79% of the interviewed enterprises were planning to deploy unified communication over the next two years (Lazar 2007). In line with these positive claims, RTC is regarded as a remedy for a suite of social, organisational, and technological issues, such as unmanageable communication volumes, a myriad of communication devices in a disintegrated communication landscape, or challenges related to mobile/virtual collaboration (cf. Brodsky 1999; Gilbertson 2007; Hutton 2001; Lazar 2007). Moreover, the application of RTC is associated with the re-design of existing business processes and service portfolios (Brodsky 1999; Burton et al. 2007; Lazar 2007; Oliva 2003). The promises are that RTC will function as the driver for increasing productivity, improving communication, and saving costs (cf. Gilbertson 2007; Hutton 2001; Rybczynski et al. 2005).

So far, the discourse on RTC has been dominated by rather undifferentiated discussions in the business press. In this thesis, I attempt to develop an empirically grounded understanding of RTC and the factors which influence its use. To position this research project and reveal the research tradition it emerged from, I will in the next section briefly mention different approaches of studying information systems. Thereafter, I shall set out the research questions and objectives before I will outline the structure of the thesis.

## **1.1 Different approaches of studying information systems**

Together with its artefacts and services, the advent of each new technological trend brings with it promises and expectations about its potential value to address acute organisational problems of the era (Orlikowski et al. 2000). Technological trends can not be dissociated from the surrounding discourses (1) in the public domain which make a technology known to the wider audience and (2) in the communities of technology evangelists, business analysts, consultants, and academic cycles which form the core ideas of how the particular technology works (Iacono et al. 2001). In the domain of RTC, for example, experts hail the technology as a remedy for a myriad of social, organisational, and technological problems. As the previous discussion of the business literature showed, experts conceive RTC as an instrument for increasing productivity, driving business process redesign, and making a

significant contribution to the bottom line. However, some more critical voices are already starting to question the hype surrounding RTC (Burton et al. 2007). The problems of such uncritical discourses are twofold (Orlikowski et al. 2000). First, assuming a universally transformative nature of technology is not empirically supported by historical examples. Second, on a theoretical level such claims are misleading since technology may be treated like an external, independent object which automatically yields benefits for individuals, organisations and economies.

To reveal the implicit and explicit theoretical assumptions of discourses surrounding RTC and to theoretically position this research project, three different approaches of studying IS are briefly outlined. In their widely cited article, Markus and Robey (1988) distinguish theories according to their causal and logical structure. The causal structure identifies conceptions of causal agency, namely the technological or organisational imperative and the emergent perspective. The technological imperative (also often called technological determinism (cf. Woolgar 2002)) argues that technology is an exogenous force which determines the behaviour of individuals or organisations. The focus is then on measuring and modelling the changes caused by technological forces (Orlikowski et al. 2000). In line with the technological imperative, experts and consultants dramatized in the previously mentioned discussions outcomes of RTC use and offered certainties on the impact the technology might have.

In stark contrast to technological determinism, the organisational imperative implies almost unlimited choices over technological options and control over the outcome. Based on the presumption of rational agents, information systems are designed to satisfy organisational needs. The influence of broader socio-organisational constraints are almost neglected and treated as variables controllable by the main decision makers. The organisational imperative has informed studies on organisational change but has also been influential in the IS discipline. Lewin's (1959) model of group decisions and social change, propagating the three stages unfreezing-changing-freezing, has left a strong impression on stage-based models in the IS field. Following Lewin's model, researchers subdivided the implementation process in distinct stages and specified tasks and challenges for each phase which managers had to address with appropriate strategies (cf. Cooper et al. 1990; Kwon et al. 1987; Munkvold 1999). Following the argumentation of a stage-based approach,

organisational behaviour is best described by formal goals, procedures and administrative arrangements through which technology is controllable. Among others, stage-based approaches have received criticism for relying on rational economic interpretations of organisational processes, drawing upon universally applicable cause-effect relationships (cf. Fitzgerald 1996; Walsham 1993; Wastell 1996).

The technological and organisational imperatives fail to account for contradictions or diverse outcomes within studies and bodies of research (Robey et al. 1999). Rather than assuming universal valid claims, more researchers have argued to disavow attempts by the popular and academic cycle to explain technology *ex ante* (cf. Orlikowski et al. 1991a; Walsham 1993). Instead, it is proposed to follow a bottom-up approach to account for everyday experiences (Barley et al. 2001; Woolgar 2002).

Finally, Markus and Robey (1988) introduce the emergent perspective which assumes that the uses and consequences of IT emerge unpredictable from complex social interaction. With no dominant cause of change being accepted, the emergent perspective differs significantly from the former two approaches. Instead, an in-depth comprehension of the organisational processes and context is required to appreciate the implementation processes. Emergent perspectives generally apply a process approach to explain how sequences of events unfold over time (Markus et al. 1988; Van de Ven et al. 2005). Tracing changes over time, the process approach, in combination with an emergent perspective, allows to incorporate several different types of effects.

Following an emergent, processual approach, researchers have conducted a significant number of studies which have concentrated on a variety of aspects associated with the outcome of information systems, such as power, politics, control, or culture (cf. Bloomfield et al. 1992; Bloomfield et al. 1994; Coombs et al. 1992; Kling et al. 1984; Markus 1983; Wilson et al. 2000). Moreover, it is argued that rather than trying to explain technology *ex ante* or privileging the surrounding discourses, technology must be used to have an effect (Orlikowski et al. 2000). Distinguishing between espoused technology and technology-in-use emphasises that research should look at specific and embedded uses by particular people in particular times and places (ibid.). However, technology-in-use should not be understood as an invitation to neglect the IT artefact. Instead, there have been calls in the IS field to take a look behind terms such as IT artefacts or groupware (Markus 2005) and

explicitly theorize about “specific technologies with distinctive cultural and computational capabilities, existing in various social, historical, and institutional contexts, understood in particular ways, and used for certain activities” (Orlikowski et al. 2001b: 131).

From this discussion a picture of research emerges that requires expertise in studying both technological and organisational matters to simultaneously comprehend both (1) the role of human agents in institutional contexts, as well as (2) the enabling and constraining capabilities of technologies (Orlikowski et al. 2001a). Arguing against a technological or organisational imperative, this thesis takes an emergent, processual perspective which attempts to explain technology-in-use by focussing on human agents within their broader socio-organisational context. I intend to evoke a nuanced explanation of RTC which goes beyond the popular, technological deterministic claims in the media. I hope to do so through analysing the social practices which influence but at the same time are influenced by RTC. This theoretical perspective shall be introduced later on in more detail. Next, I will set out the research questions and objectives before concluding with a brief overview of the thesis.

## **1.2 Research objectives and research questions**

In contrast to the business media and technology evangelists with their often overly optimistic forecasts and technological deterministic claims, this thesis aims at portraying a more nuanced evaluation of RTC. It aims at delivering an account of RTC use which does not regard technology as either an exogenous force or an almost infinitely malleable resource. Rather, it is my objective to offer an ontological explanation of RTC use; that is a conceptualisation of RTC which does not solely concentrate on the technology or the individual but explains how both factors are interrelated and the constitutive elements of social practices (the ontological understanding shall be explained later in more detail). The main objective of the research project is to develop a sophisticated understanding of how RTC affects the way people go about doing their work. The aim is therefore to give an empirically grounded explanation of RTC which focuses on (1) RTC as the premise for the opportunity to enact certain social practices, (2) implications of RTC on people’s experience of the life world, and (3) the implications of the socio-organisational dimension on RTC use. The main research questions are therefore formulated as follows:

- **How might we understand the implications of RTC on people's work practices and forms of social interaction?**
  - How can RTC use be conceptualised?
  - How does RTC affect forms of organizing work in dispersed/ co-located organisational settings?
  
- **How can we understand the enabling and constraining implications of the socio-organisational dimension on RTC use?**
  - What role does management play in promoting innovative forms of RTC use?
  - What challenges do users encounter while embedding RTC in existing/ new social practices?

So far, no in-depth case studies on RTC use have been published and an empirically informed theoretical conceptualisation of RTC is missing. Attempting to better comprehend RTC, the thesis makes a theoretical and empirical contribution. First, practice theory is introduced to theoretically underpin the understanding of RTC in situ. In particular, I develop a phenomenological understanding of the material artefact and integrate it in social practice theory to rehabilitate the status of things. Furthermore, the concept of awareness is discussed and embedded in practice theory. Second, so far, no in-depth case studies on RTC use have been published. Consequently, one of the contributions is to provide two case studies which offer rich empirical data on professionals' experience with RTC. Third, interweaving the theoretical and empirical work, I intend to advance the discussion on RTC. I shall theorize on how users experience RTC and embed it in forms of organizing work. Furthermore, I elaborate on how people's perception of each other altered and conclude with a discussion of social practices which either support or impede RTC use.

### **1.3 Structure of the thesis**

In this chapter I introduced RTC technology, broadly circumscribed and justified my approach of studying ICT, and outlined the research questions and objectives of the project.

In chapter two, I shall revisit previous research on ICT. Since scarcely any empirical research on RTC has been published, I will review work on technological artefacts that show some similarities with RTC. In particular, I will concentrate on groupware



and instant messaging. As the previous discussion on RTC has shown, traditional software companies such as IBM or Microsoft are offering RTC products and either develop completely new solutions or revamp existing ones. Because of the history of many of these companies and their product portfolio, groupware features are part of their RTC solutions. In addition to the technological overlaps, a rich body of work with in-depth empirical accounts on groupware implementation and use has been published over the last two decades which provides an invaluable starting point for this discussion. Additionally, I shall draw upon work on instant messaging. With its chat functionalities and status information, IM shows many similarities with RTC and some of today's RTC applications like Lotus Sametime derived from simple IM applications.

In chapter three, I develop a practice theoretical perspective which is informed by Giddens' structuration theory but extends it by focusing on some theoretical areas in more detail. More specifically, I shall elaborate on aspects of power and knowledge which are central components of social practices. Additionally, the discussion delves into issues on awareness/co-presence and integrates a phenomenological perspective on the role of material artefacts into a practice theoretical understanding.

The research methodology and research design is presented and justified in chapter four. To do so, I clarify the ontological and epistemological position and justify the suitability of the selected research method. I shall then give detailed information on the selection process for the research sites, the field work, data collection and data analysis before closing the chapter with some reflections on the research endeavour.

In chapters five and six, the two case studies at local.ch and IBM are described at length. Each case study begins with a discussion of the broader socio-organisational context and the forms of organising work before giving a detailed account of how RTC was embedded in people's work practices.

Chapter seven draws on the earlier developed theoretical perspective and previous research on groupware and IM to make sense of the empirical data. More specifically, I shall first conceptualise how users experienced RTC and embedded the technology in their work practices. Afterwards, I discuss the implications of the socio-organisational context on RTC use and *vice versa*.

Finally, chapter eight summarizes the results of the theoretical discussion, the case studies and the analysis in a structured manner. I shall reflect upon the lessons learned from the two cases, discuss implications for future research on RTC and ICT in more general, and give some advices for practitioners intending to apply RTC.