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Organizing control in real-time environment: The use of RTC tools in an educational startup

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This paper describes an ongoing Ph.D. research project on the use of real-time communication systems in a socially motivated internet startup company. In contrast to studies on the adoption, acceptance or effectiveness of a particular application I try to conceptualize and identify implications of real-time communications for organizing beyond instrumental gains and losses of organizational efficiency. Using a qualitative case study design the research explores the question how an organization conceptualizes its attempts to align people, resources and actions in a setting that may be perceived to lack traditional conditions for organizational control.

Real-time communication systems afford ways to reconfigure conditions for co-present practices across different boundaries. Whether designed or unintended (Riemer *et al.* 2007), this can be perceived to dilute the strict circumscription of the organization from its environment. Employees appropriate the new opportunities variably in different institutional settings, yet the communicative function necessitates that they react to the same system across different work environments. The essence of these systems goes necessarily beyond what is enacted in local practice.

Reflecting the current status of my project, the paper first discusses an approach for deciphering the elusive relationship between technology and organizing and presents then some preliminary findings from the first interviews and observation sessions.

Real-time communication in organizational settings

Fröbller & Klein (2006, p. 1) describe real-time communication (RTC) systems as a distinct type of tools resulting from the convergence of telecommunications and groupware systems. The applications typically combine a number of synchronous and asynchronous communication tools adding constant presence and availability information. Real-time communication application such as Skype may combine voice and video calls, instant messaging, text messaging to mobile phones, file transfers, conferencing and directory etc. services. RTC systems are believed to emerge as important managerial tools due to their capability to support distributed and mobile work (Fröbller and Klein 2006, p. 31–32, Huang *et al.* 2007, p. 242, Kakihara *et al.* 2005). Some industry observers are seeing hints of these applications superseding email for a particular cluster of hyperconnected employees (Aducci *et al.* 2008).

My research interest originated from the peculiar organizational reactions to the idea of using phenomenally successful, consumer-oriented Skype in the corporate environment. Since the first public release of Skype on 29 August 2003, more than 300 million user accounts have been created into the system with the number of concurrent users online topping occasionally 12 million people. Based on the combination of Voice over IP (VoIP) and peer-to-peer (P2P) architectures, Skype offers a range of real-time communication tools on a very low cost causing disruptions on the telecommunications market (Rao *et al.* 2006).

The idea of using applications such as Skype in the corporate environment has, however, met a plenty of resistance (Conry-Murray 2006, Lazar 2006, Morrissey 2005, Morrissey 2006). The perceived threat of RTC can generally be understood as potential circumventions of corporate control. Living in the millions of interconnected copies that are capable of relaying traffic through corporate firewalls, Skype system can support interactional arrangements that do not obey received organization boundaries. Morrissey (2005) writes:

“If you already lock down your desktops and restrict the software users can install, you probably don't have to worry. If not, immediately enforce a policy forbidding the use of Skype, and find out whether your firewalls and bandwidth-management tools can stop Skype in its tracks.”

Many companies have taken the advice. For instance, an IT policy document of a large, multinational consulting company conceives the boundary spanning character of Skype as a serious risk to company resources and thus bans the application within the organization. The fact that I was required not to quote the rather dull policy document serves as a perfect manifestation organizational of boundaries. They are perceived to insulate what goes on inside the organization in every respect from its environment. RTC seems to challenge the idea of organization as an entity strictly circumscribed from its environment exercising minute control within its boundaries.

The misfit might be ignored as a merely ill-conceived attempt to bring consumer innovation into corporate environment unless this would be what so-called Web 2.0 is all about. Instant messaging and Voice over IP (VoIP) calls make up a significant proportion of internet traffic and their adoption is taking off in the corporate environment (Gantz *et al.* 2008, Gantz *et al.* 2007, Lyman *et al.* 2003). One third of the Skype usage is estimated to take place within work environments and organizations are believed to face an increasing pressure from their employees to equip them with the whole range of internet-based tools (Aducci *et al.* 2008, Benkler 2006).

Technology and organizations

The relationship between forms of organizing and information and communication systems has been analysed in a number of studies (Beniger 1986, Bergquist and Ljungberg 2000, Fulk and Desanctis 1995, Kallinikos 2006, Yates 1989, Zuboff 1988). The nature of the linkage has, however, mostly evaded general conceptualizations beyond simplistic, technologically determinist or socially reductionist positions. Orlikowski and Barley (2001, p. 159) identified a relative isolation of information systems and organization studies and called for “new syntheses that fuse accounts of human agency, material constraints/affordances, and institutional dynamics into richer explanations of techno-social change”. Despite increasingly computer-mediated environment in which organizing today takes place Zammuto, Griffith, Majchrzak and Dougherty (2007, p. 749–750) report a declining interest in technology in the field of organization theory.

Analyses on new information and communication systems commonly associate their organizational implications with new patterns of communication they enable. Yet organizations are more than mere flows of mediated interaction increasingly based on the rendition of organizational reality as technological information points out Kallinikos (2006, pp. 95, 101–105) who calls the changing infrastructural conditions for organizing as the habitat of information. The emerging socio-technical environment is characterized by disaggregation and recombination of organizational practices at the level of technological information. From this perspective the flow of presence information across work environments represents a qualitatively new type of data involved in the ongoing configuration of settings in which people interact. This data, which is generally ephemeral and not stored into databases (yet), provides a novel perspective on how organizational reality is increasingly rendered as technological information.

Literature on corporate email and presence awareness

Email is an almost universally adopted tool for organizational communication. As the most important means of electronic communication it provides a reference point for subsequent communication technologies. I will first briefly review some studies on the adoption and use of email in organizational settings to identify key differences with RTC systems. In order to conceptualize the significance of these differences I draw then together a constellation of ideas around computer-mediated presence that can be seen as a case of computational rendition of reality.

Corporate email

In contradistinction to the global scope of email today, the initial uptake of the medium followed often the received lines of communication within the organization. Comparing telephone and email in early 1990s, Hinds and Kiesler (1995, p. 389) “found that lateral and out-of-chain communication was disproportionately by telephone for all employees”. van den Hooff (2005) describes email adoption in a longitudinal study from 1993 to 2000 as a punctuated learning process with gradually growing orientation towards communication across organizational boundaries. Kettinger and Grover (1997, p. 514) note that internet was one of the key enablers of interorganizational electronic mail that, nevertheless, relied by and large on centrally managed corporate servers.

Both the organizational adoption and the situated choice of electronic communications tool are conditioned by expectations regarding recipient availability. Sillince, MacDonald, Lefang and Frost (1998) studied email adoption in small firms in the UK. They found that smaller companies were less likely to adopt email and more likely to emphasize external orientation in email communication. The findings are generally consistent with the extended technology acceptance model developed and tested by Strader, Ramaswami and Houle (2007, pp. 61–62) who show that the adoption of electronic communication systems is conditioned by perceived network externalities. M. Lynne Markus (1994) criticizes media richness theory for being too individualistic and technologically determinist to explain choice of electronic communications medium by showing how managers use email for a wide range of communicative tasks mediated by expected recipient availability and norms of accepted behaviour (see also Straub and Karahanna 1998).

Focusing on the adoption patterns, medium choice and individual usage of email aforementioned studies say, however, little about its implications on organizing itself. Recent studies by Mazmanian, Orlikowski and Yates (2006a, 2006b) and Orlikowski (2007, p. 1443) on mobile BlackBerry devices¹ reveal that email can inconspicuously support heightened expectations of nearly immediate availability and reciprocity thus changing the limits of conceivable behaviour. The design of RTC systems take this to new level by enabling user to explicitly manage their availability.

Presence awareness

Awareness is a pivotal idea adopted by researchers in computer supported cooperative work to grasp how effective cooperation is accomplished without individuals focusing attention on aligning their acts (Schmidt 2002, p. 285). It entails actors unobtrusively both monitoring the others acts in order “to mesh with unfolding work of the colleagues” and making their own acts accordingly visible (Schmidt 2002, p. 291). The design of RTC systems incorporates a status indicator that intends to enable the user to signal his availability for other colleagues online.

¹ BlackBerry is effectively a mobile phone built around a sophisticated email application that receives messages automatically without the user having to actively retrieve them.

Awareness and visibility are features of a socially translucent system described by Erickson and Kellogg (2000) who associate the two attributes with accountability. The idea of accountability is simple yet powerful. Since a person knows the others know that he knows about their ongoing actions, he will feel accountable for relating his line of activity with the others'. Using an architectural setting of co-presence as an example Erickson and Kellogg (2000, p. 62) discuss a glass-door design: "Suppose that I do not care whether I hurt others: nevertheless, I will open the door slowly because *I know that you know that I know you are there*, and therefore I will be held *accountable* for my actions."

Visibility, awareness and accountability naturally coupled in physical settings while in computer-mediated communication their connection is open and negotiable. The flow of computer-mediated availability and presence data associated with RTC systems forces employees to enter into the negotiations over their availability and presence. It also makes easier to synchronize distributed activities in real-time.

Empirical case

The pilot study in April–May 2007 revealed that Skype was conceived quite differently in work environments underpinned by different conceptions of organizational control. Trying to balance various theoretical and practical requirements I decided to look at the co-evolution of a new organization and its real-time communication infrastructure instead of studying the intrusion of new kind of application into an established corporate environment. At my research site Skype had become nearly ubiquitous amongst an impressive array of internet-based tools informants reported using regularly for their work.

The School of Everything Limited (SoE) is a social enterprise incorporated on 27 September 2006 by five co-founders. The company is driven by the founders' shared determination to introduce a radical innovation in the educational sector while aiming at financial profitability at the same time. SoE develops and operates an internet-based platform² launched in September 2007 to support informal learning by matching individuals who are interested in teaching and learning various skills. The organization defines its mission on as follows:

² www.schoolofeverything.com

“Our goal is to do for education what YouTube has done for television, or what eBay did for retail: to open up a huge and fertile space between the professional and the amateur. A space where people teach what they know and learn what they don't.”

www.schoolofeverything.com/about/vision, accessed 19 May 2008

Organizational boundaries, control mechanisms and information infrastructures are known to be intimately related to each other (Ciborra *et al.* 2000). I will first sketch how the organization perceives its boundaries and control mechanisms and then discuss how RTC systems pertain to these aspects at SoE. This way I hope to acknowledge the role of new technology in organizing (if any) while avoiding determinist or reductionist positions.

Fluid organizational boundaries

The five co-founders started working on the idea that was eventually registered as School of Everything in early 2006. Located across the UK in different organizations they relied heavily on various forms of mediated communication until the Young Foundation offered in May 2007 SoE a place in a shared open-plan office where it could gather permanently. My fieldwork began in February 2008. An immediate observation was that the organization wielded only partial ownership over its employees' time, office space, and largely internet-based information and communication infrastructure.

The office space provides no physical boundaries for organizations crammed over time around small groups of desks, shelving, filing cabinets, server closets etc. The employees had kept working for other organizations as they did not receive regular salary until the company secured £350,000 on its first round of funding in April 2008. Neither is the company interested in accumulating intellectual property from software development activity. One of the founders pointed out that there was no business reason to keep the program code for the platform proprietary. Most of the programming is based on an open source content management platform Drupal while SoE code is released back into its framework.

These observations do not imply that the organization would not have boundaries or try to enact them. As a part of the efforts to organize to meet its targets tied to funding SoE will move to a dedicated space in July. The boundaries are, however, neither perceived definitive nor the basis for how the organization is held together. As a company, the boundaries of SoE are remarkably fluid.

Internet as the organizational information infrastructure

Internet is an intrinsic part of SoE's information and communication infrastructure. The organization stores and passes a great deal of its documents and data through various internet services such as Google Docs for editing documents and spreadsheets, Highrise for managing contacts, Skype and Google Chat for real-time communications, Twitter for micro-blogging, and FolderShare for document sharing.

The company depends on internet services it has little control over. Ciborra & al. (2000) discovered that even large corporations can hardly enforce rigid control over their information infrastructures. Traditional enterprise systems are, however, cordoned off from the internet which is the infrastructure for SoE. Since many of the internet-based tools are either free or relatively cheap, a rapid trial-and-adopt-or-abandon pattern has emerged within SoE.

"Because these tools are free or cheap we start off just by installing it and seeing if anyone starts using it. We've found it has happened organically that we've ended up dropping things because they are not quite what we need. Sometimes there are frustrations where I actually wish we could go back [to what we used to use] because I found them useful, but the other people didn't. Like the internal blog - I thought that was very useful."

Arnold, Co-Founder

These observations contrast with the earlier findings on email use in small companies by Sillince, MacDonald, Lefang and Frost (1998, p. 237) who argue that "small firms require few sophisticated ways of communicating internally because the entire workforce often works in the same room or building." Despite its small size, work in SoE has evolved as a mixture of co-located and distributed practices supported by new means of internet-based communication and information exchange. The pace of technology adoption maybe explained partly by the fact that SoE develops software itself, but in principle there is no reason why the ways of organizing could not apply to other industries as well.

Organizational control without boundaries

The founders of SoE share a strong sense of common mission, which has helped to hold them together with minimal external reinforcement such as a regular salary based on an employment contract. The idea of School of Everything crystallized during a project the founders collaborated on before incorporating the company. Having known each other for a long time they share what van Fenema and Räisänen (2005) call relational infrastructure. Mutual expectations are created effortlessly and many things can be taken for granted between the co-founders.

Shared mission and relational infrastructure are not, however, sufficient to keep the variety of activities aligned as the organizational objectives become more specific, and the number of employees as well as speed of operations grow (Beniger 1986). Despite the avid use of technologies SoE has not found computerized solution for organizational control.

“We have tried lots of project management tools and none of them has really worked for us. Really it is just a question of those weekly meetings making sure that we know what we are doing and then whenever the actual project need to work together then it is much more direct and hands-on.”

Seth, Co-Founder

Characterized by fluid organizational boundaries and internet-based information infrastructure the company relies on few formal and explicit control mechanisms. The organization instituted late 2007 regular meetings Mondays, in which everybody is supposed to be present. The role of these meetings in keeping things in order was elaborated by another co-founder.

“We’ve started to get a rhythm and because of that we do not need to keep track of where everyone is and what they are doing.”

Arnold, Co-Founder

Weekly meetings enacted a company-wide a temporal structure though which “people makes sense of, regulate, coordinate, and account for their activities” (Orlikowski and Yates 2002, p. 686). As computerized control is not adequate and organizational boundaries do not secure constant co-presence, there is a need for structure that secures enough co-presence to enable keeping things aligned.

Real-time communication in School of Everything

Drawing from the idea of presence I will next discuss some observations how RTC tools pertain to how work is organized at SoE. In general, none of the informants mentioned any explicit policies on how to use the variety of tools. People drew to a significant degree on their personal habits and attitudes towards each tool.

“It [Skype] is a sort of necessity rather than hey this is a really good idea, let’s get on and do it. It is kind of I need to, I have to, I have no choice.”

Arnold, Co-Founder

The tool-environment has, nevertheless, a kind of inevitability as the medium through which work is done.

Physical co-presence

All members of the organization valued physical co-presence that had been somewhat scarce resource throughout the history of SoE. It was said to provide ‘unparalleled emotional metadata’. The organization had obtained an office space, but the nature of work and multiplicity of organizational commitments resulted in employees not being always physically present. Arnold described a practice that had evolved between him and a lead developer:

“ Mike works for three and half days a week, including a half day from home. [...] We are starting to get a rhythm where he is with us on Mondays, Wednesdays and Fridays.”

Arnold, Co-Founder

While the whole organization was present to each other on a weekly basis on every Monday, the pattern between Arnold and Mike is an example of how that common rhythm consists of a variety of sub-ordinate rhythms. Lacking firm boundaries and formal controls, the organization is nevertheless quickly setting up temporal structures to maintain coherent outputs. RTC is heavily involved in this process as the alignment of various sub-patterns is based on virtual temporal symmetries (Orlikowski and Yates 2002, p. 695).

Online status indicator

The status indicator feature in RTC applications is designed to informate peer availability across settings of work environments and thus provide rudimentary aspects of presence awareness beyond physical co-presence. Its use, however, illustrates complexities that emerge with computer-mediated presence. Rendering presence as technological information does not merely transport it across settings, but changes the phenomenon itself.

None of the informants told they set their status simply to correspond to their availability for communication. For instance, Arnold tended to hide his presence to avoid incoming calls and messages at inappropriate occasions while Seth usually kept his status online whenever he had his computer turned on. The informants were aware of these complexities and also acted upon them:

“I have a couple of friends who hide their status, but I know they hide their status so occasionally I just try them anyway and sometimes they are there.”

Seth, Co-Founder

SoE also started posting on the website short snippets about the ongoing activities at the office using Twitter micro-blogging tool.

Distant collaboration

RTC systems are typically associated with collaboration over distance. According to informants the relevance of this aspect for SoE had diminished since the organization gathered now regularly at the office. There were, however, still occasions when collaboration over distance was needed. Arnold, who was reluctant to make his status visible online, described the value of mediated presence on a planned occasions.

“I generally use [Skype] when they are out of the office such as yesterday when Mike was working from home and we were trying to sort out the wiki together so we ran Skype for whole time which was couple of hours going through things just on chat.”

Arnold, Co-Founder

RTC tools seem to provide unprecedented medium for this kind of virtual temporal symmetries at the microscopic level of ongoing practices. Since software development work takes place on the same screen where RTC tools sit, the communicative and other tasks are interleaved just by switching the active window. In a similar manner, Lucy described having Skype voice line open while editing a document in Google Docs with a colleague in other organization. Mediated communication can become less punctuated and more unobtrusively interwoven with the unfolding task structure of organization.

Collaboration over distance was also essential for individual members to be able to serve their other organizational commitments while working at the SoE office. Given the new virtual temporal symmetries afforded by RTC systems, an employee can engage in real-time the temporal structures of a several organizations while being physically present at one.

Short distance collaboration

The use of RTC tools is not, however, limited to distant collaboration. The employees ping for small pieces from information and exchange documents using Skype while sitting just few desks away in the same room. More interestingly, it is used to avoid making one's current activity visible to colleagues in general while interacting synchronously with one of them.

In an open-plan office short distance collaboration took place also across organizational boundaries. Seth was involved with organizing an event with another small organization located in the same building. His involvement with these activities were synchronized with the help of Skype chat.

Concluding remarks

Looking across the range of different tools involved in playing out presence awareness that arguable differentiates RTC systems from their predecessors I have tried to pinpoint ways they may reframe interactional settings and thus change how organization perceives its boundaries, control and information infrastructure. Figure 1 illustrates a variety of functions computer-mediated presence obtained within SoE.

	Within organization	External communication
Within local setting	hide one's line of activity from co-present colleagues	hide one's line of activity from co-present colleagues
Long-distance interaction	substitute for physical co-presence	engage in the unfolding operations of another organization

Figure 1. Computer-mediated presence performed for a variety of functions by individual employees.

Acknowledging Licoppe's (2004) remarks that social relationships transcend any particular interaction, medium and situation, the interplay of variety of tools is key element in how SoE is organized. Looking exclusively at one tool would provide only a very limited view into the questions motivating this study. It is also important to note that physical and mediated presence are not separate domains, but can overlap in various ways. Furthermore, the concept of virtual temporal symmetry could provide a useful perspective to study further organizing in the context of increasingly informatized presence and work tasks.

The findings presented in this paper have some obvious limitations beyond the provisional nature of the research. The case does not tell whether the observed ways of organizing are sustainable once the organization becomes more established and grows in size. The creation

of viable organizations can, however, be seen as interesting on its own right. Given the current lack of established “real-time communication” culture in organizations some of the findings may become moderated once people become more accustomed to professional RTC.

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