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Interactivity in the Wild

An Empirical Study of 'Interactivity' as Understood in Organizational Practices

KLAUS BRUHN JENSEN

Abstract

Interactivity remains a central and yet notoriously difficult notion in studies of computer-mediated communication. Compared to most previous research, which has taken theoretical and deductive routes, this article explores interactivity empirically and inductively with particular reference to collaboration within organizations. The study relied on a theoretical sample of interview respondents – designers of web applications as well as end-users, (middle) management as well as rank-and-file employees. The findings, first, help to specify the meaning of 'interactivity,' 'communication,' and 'information' for everyday work practices. Second, the respondents provide contextualized arguments and narratives concerning how media that offer different degrees of interactivity, may substitute or complement each other. Third, the analyses indicate how e-mail, web applications, and other media serve to constitute specific forms of interaction between colleagues and departments within an organization. For further research, the article suggests the relevance of examining interactivity, in part, as a characteristic of the simultaneous use of several media. Finally, the interview discourses bear witness to how the understanding of interactive media forms within organizations is shaped, as well, by the wider social setting embedding both media and organizations.

Keywords: interactivity, organizational communication, work, intermediality

Introduction

'Interactivity' remains one of the most central concepts – and one of the most notoriously difficult to define (J. F. Jensen, 1999; Kiouisis, 2002; McMillan, 2002) – in research on computer media in general, and in studies of web communication in particular. The notion also regularly informs accounts by both business leaders and established political interests (Gates, 1995; Government, 1994) regarding the potential commercial as well as broader social implications of the internet. Popular movements, in their turn, have sought to join a participatory, interactive variety of politics with computer technology so as to promote alternative forms of social organization from the local to the global level (Rheingold, 1994).

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The exploratory study reported in the present article, asked what ‘interactivity’ means in practice to people relying on web applications and other media in their daily work. While a great deal of previous research has taken a largely deductive approach, offering definitions, typologies, and scales of interactivity, this study seeks to complement that perspective by inductively tapping the ‘lay theories’ (Furnham, 1988; McQuail, 2000: 8) of ordinary social agents. In this regard, the article joins Hutchins (1995) in exploring distinctive features of human cognition and interaction, not merely in the study or the laboratory, but in the wild. Compared to, for instance, Downes and McMillan (2000), who interviewed teachers and other specialists in computing about their understanding of interactivity, this study involved ordinary computer users on the job.

The first section below briefly characterizes some main conceptions of interactivity, as formulated across several disciplines and interdisciplinary fields. These conceptions may be rendered in the form of a model, which, for the purpose of the empirical study, served to map the research domain, and informed the development of a guide for semi-structured interviews with employees from two different organizations – a large bank and a medium-sized web development company (see Appendix 2 for details). The following section lays out the design of the empirical investigation, and considers some methodological issues particularly concerning the respondents’ capacity to verbalize their media use and other work-related practices. The main portion of the article identifies and illustrates ways in which the present sample of respondents described, narrated, and argued about interactivity. The discussion of findings gives special attention to the different types of interactivity which respondents associated with particular media and with particular tasks within the organization, including their interrelations with coworkers and management. The final section addresses these respondents’ more general experience of computers in the workplace, for better or worse, and probes their views of what ‘interactivity’ might entail in the future. The conclusion reconsiders the specific relevance of qualitative empirical studies for theory development concerning computer media, and outlines some issues for further research on interactive media forms.

Interactivities: Modeling an Interdisciplinary Concept

Three Disciplinary Sources

Before there was interactivity, there was interaction, at least from the perspective of the history of ideas and scientific concepts. As indicated by one review of the terminological uses of ‘interactivity,’ it derives from ‘interaction,’ “a concept which generally means: ‘exchange’, ‘interplay’, ‘mutual influence’” (J. F. Jensen, 1999: 165). For the purposes of organizational and communication research, the groundwork on this concept was done within sociology. As a discipline, sociology has sought to theorize how the actions of two or more individuals come to be coordinated, thus enabling community and society. In modern societies, technologies of transportation and communication have played an ever increasing role in facilitating more complex interaction across time and space, what Giddens (1990) has referred to as time-space distancing. Nevertheless, interaction as such remains an elementary constituent of all social life, from the micro to the macro level, and across public as well as private social settings.

An important aspect of the concept of interaction, as developed within sociology and other social sciences, has been meaning or interpretation. In order to qualify as interaction, an activity must be interpreted in terms of some form of contextual meaning, relevance, or consequence, by participants and/or bystanders. One classic contribution emphasizing the meaningful nature of social interaction, was the work of Mead (1934),

who referred to the various kinds of ‘significant others’ in relation to whom individuals come to define themselves, their identities, and their competences. Beyond primary socialization and face-to-face exchanges, information and communication technologies – ‘media,’ for short – have become important arenas of significant others.

Concerning media, ‘interactivity’ has developed as a derivative of ‘interaction,’ suggesting an analogy between human-human and human-machine exchanges. While originating in the era of batch processing, with reference to a user observing and modifying the partial results of a run in an ‘interactive mode’ (J. F. Jensen, 1999: 168), interactivity has come to refer more broadly to the process by which a human operates a computer in a sequentially structured manner, as covered by the field of human-computer interaction (HCI) (Preece, Rogers, & Sharp, 2002). The field of artificial-intelligence research has pursued a more literal understanding of the analogy with rather mixed results (Partridge, 1991). Most importantly, in the era of networked personal computers, the notion of interactivity has highlighted the many ways in which users can modify the form and content of computer messages and, in doing so, accomplish a wide range of social tasks during work as well as leisure.

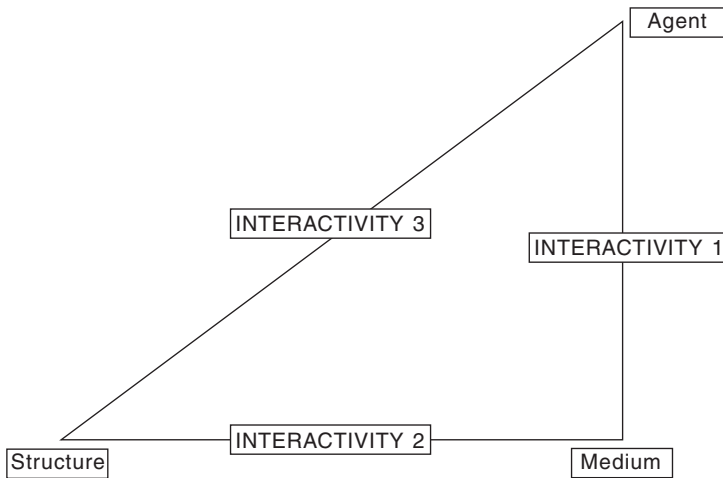
The third and most recent theoretical engagement with interactivity has occurred within the field of media and communication research (K. B. Jensen, 2002c). On the one hand, the modern media are constitutive elements of social interaction as traditionally studied by sociology; on the other hand, especially digital media forms increasingly facilitate interactivity in the sense of HCI, as earlier media forms begin to converge, to a degree, on a single computer platform. It is the joining of these two aspects of interactivity which has given digital media their distinctive technological profile and their major social implications. In the organizational context, for example, this entails a shift of focus, away from the ‘media’ of collaboration, and toward the processes of ‘communication’ between collaborators. Whereas some media and communication research has suggested that ‘interactivity’ is not only overused as a term, but useless as an analytical concept because of its diverse and frequently imprecise meanings (Aarseth, 2003), this article takes an alternative, empirical route, exploring how ordinary computer users speak of interactivity, which may still hold lessons for media research and communication theory.

An Interdisciplinary Model

In order to focus the various research questions regarding interactivity, it is helpful to relate the several disciplinary conceptions and interventions in one operational model. Figure 1 departs from the basic elements in ‘the constitution of society’ (Giddens, 1984), as understood in much recent social theory. The model assumes the interrelatedness of structure, agency, and media in modern societies. One of Giddens’ central points is that the social structure is not so much a constraint on individuals as an enabling condition of their actions. Pre-existing social institutions, procedures, and practices provide a context for individual action. Equally, the myriad actions of individuals serve to cumulatively reconstruct and, to a degree, reform the social structure. This dialectic is what Giddens refers to as ‘the duality of structure.’

Compared to Giddens’ contribution, the present model reemphasizes the role of media and, more broadly, the domain of communication and culture in social life (see further K. B. Jensen, 2002a; also Slevin, 2000; Thompson, 1995). Figure 1 understands ‘media’ in an inclusive sense, comprising both face-to-face encounters and technologically mediated communication. Social agents orient themselves toward each other and toward social structures with reference to more or less articulated frameworks of understanding, as expressed and preserved in more or less durable media. Without media of

Figure 1. An Interdisciplinary Model of Interactivity



communication, no coordinated agency and, hence, no society. The model has affinities to the emphasis placed on mediating artifacts in social practices by activity theory (Engeström, 1999). In studies of organizational communication (Jablin & Putnam, 2001), structuration theory has been influential in the attempt to account for how technological media shape, and are themselves shaped by, organizational structures and processes (Orlikowski, 2000; Orlikowski & Robey, 1991).

The model identifies three aspects of the concept of interactivity. Although each aspect has special affinities to one of the three research areas as delimited and reviewed above – sociology, HCI, and media and communication research – the model suggests their interdependence in practice. It is for empirical research to examine and clarify the nature of such interdependence and its implications for the design and use of different media forms.

- *Interactivity 1.* The first type of interactivity refers to the medium-user connection of communication, as examined not least by HCI research. Here, interactivity is a form of selectivity – users make selections from a preprogrammed range of options so as to make the session proceed. This structured interchange in ‘turns’ corresponds, in certain respects, to the turn-taking of an ordinary conversation (Sacks, Schegloff, & Jefferson, 1974). Whereas system developers and designers prepare the range of turn-taking, users, to a degree, also may customize their interface and the nature of their interaction with the system.
- *Interactivity 2.* The second type of interactivity covers the mutual influence of media technologies and social contexts on each other: How does a given technology come to be integrated into a particular social context? Such questions are familiar from classic sociology as well as from organizational communication research, which has been struggling with definitions of communication as either a separate phenomenon existing in parallel with other social, economic, and psychological phenomena, or as a constitutive feature – the organization as a system of communication (Deetz, 2001: 5). (A third position would define organizational communication essentially as a research specialization.) At issue is also the traditional problem of how to account for the relative determination of society by technology, and vice versa.

- *Interactivity 3*. The third and final type of interactivity focuses attention on individual social agents' exchanges with each other, as facilitated by media and as studied within media and communication research. At the same time, each individual agent encounters other agents as instances of the wider structure in which all are embedded. In structuration terms (Giddens, 1984), individual social agents participate locally and continuously in the maintenance of organizations and societies on a global scale. Importantly, the scale and speed of computer-mediated interaction are such that they promote new forms of social organization. To exemplify, not only do the seemingly minimal actions of automobile designers and construction workers accumulate as cars in computer-aided design and manufacture (CAD/CAM), but key social institutions such as banks and government services also become possible, in part, through computer-mediated collaboration.

In review, Figure 1 serves to specify some aspects of interactivity which are encountered and handled by multiple distributed actors in organizations as part of their daily work. The aim of the empirical study is to gain a better understanding of their 'emic' (Pike, 1967) or 'native's perspective' on interactivity. Toward this end, the interviews explored especially what has been termed Interactivity 1 and Interactivity 3 – the respondents' accounts of interaction with media and with colleagues within the organization – but also probed for descriptions and assessments of how the overarching relationship between various media and the organization in question (Interactivity 2) might be understood in the context of work.

Methodology

The empirical study took the common terminology of 'interactivity' as its point of departure, and went on to explore how a small sample of respondents described their interactions with various media technologies and with a range of collaborators in their workplace. In doing so, the study design assumed that the respondents would be familiar, to a degree, with such terminology from work as well as from public debate. Moreover, the respondents were well-placed to offer concrete accounts of interactivity as experienced and enacted at work. In addition to addressing the role of different media in collaboration with colleagues and in relations with management, the interviews asked for the respondents' 'best' and 'worst' experiences with computers at work – utopias as well as dystopias of computer media use. Individual interviews were chosen as the method of data collection in order to probe for specific nuances of terminology as well as to tap a range of personal and professional experiences with interactive media (Kvale, 1996; Marshall & Rossman, 1999). The interviews were conducted in mid-2002. The interview guide is reproduced in Appendix 1.

The respondents were selected so as to represent a reasonable spread of job descriptions and communicative tasks. They constitute a theoretical sample (Lindlof & Taylor, 2002; Miles & Huberman, 1994) with reference to different types of companies and different levels of their organizational hierarchies. On the one hand, both web developer and web user organizations – designers and end-users – were included. On the other hand, representatives of (middle) management as well as of the rank-and-file entered into the sample. Concretely, employees of large Nordic bank and of a medium-sized web development company in Denmark were interviewed at their place of work. A summary description of the companies and of the respondents is found in Appendix 2.

The main data set consists in eight depth interviews, lasting approximately 30-60 minutes each, which have been transcribed verbatim. Since the aim was to establish con-

ceptual distinctions and categories that inform the respondents' approach to media, an in-depth analysis of the full set of interview transcripts was carried out.

First, a 'heuristic coding' (Silverman, 2000: 170) was conducted of the transcripts. Compared with coding as traditionally understood, which assigns terms, assertions, and other linguistic units to fixed and mutually exclusive categories, the purpose of heuristic or 'indexical' (Fielding & Lee, 1998: 176) coding is to organize a large and complex textual data set into structures which allow for the retrieval, analysis, and interpretation of various sequences through several iterations. Heuristic coding has affinities to Herbert Blumer's (Blumer, 1954) research strategy of using 'sensitizing concepts,' which are meant to open up an empirical domain for analysis, rather than closing it around a definitive systematic or synthesis. The present analysis relied on the software package NVivo, whose features support heuristic coding. Recently, the relevance of computer software as one means of ensuring the systematicity and intersubjectivity of qualitative research has been recognized (Weitzman, 2000).

Second, a central purpose of the analysis was to identify nuances of the respondents' understanding of media within the workplace. Importantly, while some terms and distinctions were proposed in the interview guide, others were introduced or redeveloped by the respondents as part of their arguments and narratives – in accordance with the classic qualitative research strategy of seeking 'the native's perspective' (Malinowski, 1922). The analysis drew on the tradition of linguistic discourse analysis (Wetherell, Taylor, & Yates, 2001), which allows for a detailed explication of how people verbally articulate, for example, their professional competences, personal identities, and general worldviews. The approach, further, is a candidate for developing more procedural and explicit forms of qualitative data analysis which, so far, have been a weak point of the qualitative tradition (K. B. Jensen, 2002b). The present analysis gave special attention to three features of discourse:

- *Semantic categories* – the respondents' definitions of and distinctions between different kinds of media and work-related activities;
- *Arguments* – what counts as arguments concerning computers and other media, whether of a technological or social nature, and what respondents take for granted as premises of their arguments;
- *Narratives* – the kinds of stories that respondents tell to make their point, and the contexts in which they are introduced.

Appendix 3 illustrates the application of the analytical approach.

It should be noted from the outset that an interview methodology necessarily focuses on the respondents' immediate as well as explicit understanding of both the 'interactivity' terminology and particular work practices. Interviewing is less suited to examine, for example, work tasks in their specific context or shifts in the organizational uses of technology over time, as covered by participating observation, think-aloud methods, document studies, and other methodologies. The value of interviewing for the present study is that it facilitates reflexivity on such immediate understandings, as expressed by interviewees in 'surface-structure' terminological categories (extrapolating from Chomsky, 1965), and as supplemented by their broader accounts of daily work with a variety of media. This approach to data collection, next, leads into analyses, interpretations, and inferences regarding 'deep-structure' conceptual categories and frames of reference. Current social theory recognizes a close link between discursive understanding and practice – between meaning and action – in 'the social construction of reality' (Berger & Luckmann, 1966). In addition to Giddens (1984), who refers to 'practical

consciousness' as a largely implicit everyday orientation that may, however, be retrieved and reflected upon, Pierre Bourdieu (Bourdieu, 1984 [1979]) has argued that social agents' frames of reference should be thought of, less as mental representations, than as situated predispositions to act. Accordingly, the following analyses departed from the respondents' immediate understanding and *terminology* of 'interactivity,' exploring their semantic categories and *concepts*, and noting, as well, their descriptions and reflections regarding their *practice* of working with and through media.

What is Interactivity?

Interactivity, Interaction, and Communication

In their initial reflections, the respondents distinguished two main aspects of 'interactivity'. First, the term was associated primarily with computers and software applications, and only to a limited degree with other media or with a more abstract, sociological conception of interaction. References were made to the experience that "things start happening by themselves" on a computer, as one secretary from BanCo (see Appendix 2) put it. One operates a "machine" or "system" and "receives something in return." This 'something' could be defined as a "return of investment" in terms of time and effort. As underlined by the head of the WebCo usability department (Appendix 2), however, the system ultimately is nothing but "a world of signals," not a world of human consciousness or meaning. The ideal outcome of the interchange was described by a web site developer as "a unique presentation" to a particular human user, being the product of a sequence of choices within a specific context of relevance:

[...] it has to be a presentation that no other user gets, because that presentation or screen image which is the result of some action taken by the user has to be unique to this user, has to be the result of some choices.

One of the examples given is that of figuring out mortgage rates when one is buying a house. The example indicates that both this and other respondents drew freely on their experience with media outside of work, approaching the computer as a common denominator across different social domains.

Second, 'communication' is the preferred term when it comes to colleagues, clients, and other collaborators. While some respondents reserve the term 'interactivity' for computers, and 'communication' for people, others prefer to speak entirely in terms of communication, assigning computers to the role of a more or less incidental tool. A secretary at BanCo summed up the view that "communication, you know, that's passing on information, and that we talk to each other." The WebCo head of usability added that communication entails a human element of meaning and emotion, saying that "it has to do with the exchange of messages and feelings."

Addressing 'interactivity' as a term in further detail, respondents chose different lines of argument. (One respondent was unfamiliar with the term in the first place.) Especially at the management level, some respondents engaged in further deliberations concerning 'interactivity' and 'interaction,' terms that were used interchangeably. A communications consultant at WebCo argued that the visual branding of a website could be seen as a means of interactivity if it implicitly projects a particular company profile and consistently supports user interaction. In addition, he mentioned that his partner, who is a choreographer and dancer, does refer to 'interaction' in an entirely different professional context:

[...] typically when she speaks of this, it has to do primarily with what different people do on stage, how they interact with each other, what kind of interaction generally is taking place around the stage [...].

Also the academically trained respondents, however, found that such reflections, when involving their daily work, tend to get “terribly abstract.” Nevertheless, most were comfortable considering the interactivity provided by different media types, as well as recognizing human communication as ‘interaction,’ even if they were inclined to reject further abstractions regarding interaction between, for example, sections of a company.

In some instances, a respondent’s terminology reflected the conceptual difficulty of establishing what it means to ‘interact’ or ‘communicate’ with a machine. The WebCo communications consultant described his view of communication as follows:

Communication to me [...] is an exchange between two persons or two systems, if you like. Of course, it’s pretty important whether you’re talking about systems or not talking about systems, but anyway, and communication typically will have a purpose, it may be more or less explicit, and it will be aimed at a specific user group, and the design will take into account what you wish to accomplish, and then there has to be an expected effect.

The hesitation and reflection midway in the quotation (“...but anyway...”) recalls, and elides, the distinction between the ‘interaction’ of sociology and the ‘interactivity’ of HCI. The respondent elaborated, however, that, to him, ‘communication’ has more to do with language and understanding, whereas ‘interaction’ is oriented toward action and outcomes.

The question of whether computers can, in some sense, communicate or even think – a familiar issue in artificial intelligence research (Boden, 1996) as well as in much popular culture, from cinema to computer games (Manovich, 2001) – was touched on in connection with views of humans and machines as partners at work. Mostly, the respondents explicitly rejected the notion of their computer being a colleague or partner, preferring the notion of a ‘tool,’ as elaborated below. Previous research also suggests that any tendency to treat computers as having personalities and emotions is preconscious, and is played out in practice (Reeves & Nass, 1996). In one instance, though, a secretary from BanCo told small stories of how, if something goes wrong, “you speak to it as if it were a human being, you know, you do that automatically, I think [...] you may be pushing the wrong button, well, then you get mad and say [...] ‘Really now, go faster!’ [...] or, ‘Don’t stop here, come on!’”. The same respondent noted that, at home, she might choose more abusive words to address her computer.

One additional aspect of interactivity is its status as a recognized and debated buzzword in much commercial as well as political discourse. Especially the respondents from WebCo volunteered critical comments on this matter. The communications consultant, who mentions that he previously worked in the media industry, argues that his former colleagues are guilty of overselling their products with reference to their interactive qualities, and finds that both he and his current colleagues have made a specific effort to develop and present their services in terms of communication. Also one of the site developers notes a widespread tendency to rely on sloppy definitions of interactivity in bids and presentations. In practical planning and design work, though, he adds, the hype may actually dissolve:

Of course, it’s absolutely no good in communicating with a client if you yourself aren’t 100 percent sure what you really mean by it, since the client is in the same situation, you know, so you of course may speak past one another, but really, you’ll quickly get down to very concrete issues, I mean, instead of moving at

that abstract level, so the danger of speaking past one another may be minimized that way, you know.

An interesting implication for further research is how different notions of interactivity may be passed back and forth, and negotiated, between discourses of marketing, public debate, and practical design. As concluded by, for example, Stone (1991), the cyberspace metaphor appeared to fundamentally affect not only literary, but also technical and design discourse of the 1980s.

Questions of Degree

Moving beyond the basic question of what 'interactivity' might be, the interviews addressed the different possible degrees of interactivity of various software applications as well as of other media. The respondents identified at least three degrees or varieties. First, as argued by one web site developer, a distinction can be made between basic information-gathering and more interactive uses of media. To him, interactivity:

has to be something more than, you know, for example, an ordinary website, you know, where you enter and find some information and read it. That's not interactive [...] although [...] there are many who put it like this, that it's more interactive than watching television, for instance, which of course it is to some degree, right, also more interactive than watching teletext perhaps [...].

This respondent's criterion for 'true' interactivity is the unique presentation, as noted above. If sufficiently contextualized and defined by users, items of information, thus, may qualify as interactive.

Second, respondents associated a more substantial or genuine form of interactivity with the involvement of other people. Even if, as mentioned, communication was the preferred term for human interchanges, most respondents reflected on a broader notion of interactivity. A secretary at BanCo made a distinction between reading:

a particular message or some information, and then you have to, uh, react to it, act according to it, do something according to it [...] as opposed to actually in the system responding or communicating with the sender of some information.

Whereas these first two varieties could be considered communicative prototypes – gaining access to *information* and engaging in dialogue or *communication* – the third variety may be specific to, or typical of, computer media. In brief, it involves communication with oneself, sometimes in an intense sequence of turns, the main computer-related example being games. Here, communication entails imagining and participating in a distinctive universe whose actors and choices have been prestructured, despite significant degrees of freedom for the user. The communications consultant at WebCo explained how, as part of a campaign for the National Health Board concerning drug abuse, addressed to teenagers, the company developed a game which, within bounds, encouraged its target audience to explore that universe. Like one of the site developers, he further argues that games offer the highest degree of interactivity of all computer genres – as perhaps reflected in *QUAKE* tournaments as a regular Friday event practiced at the company during an earlier period. Moreover, the consultant comments that games may have more general implications for the design of interactive media in the future. At WebCo, at least, there seem to exist different 'schools' of design – one, including himself, that gives priority to 'user friendliness' and usability, and another group who, he says, live "a digital life" with separate internet identities, and who propose to develop alternative aesthetic universes for clients.

The respondents introduced an additional distinction between interactivity as a feature of computers as such, and as a quality of single applications. A controller at BanCo offered “my own definition” by saying that it is “not so much the kinds of programs and so on, but it is the interactivity that there is between me and that damned machine.” Others at BanCo as well as at WebCo emphasized the more or less interactive features of different applications; the IT professionals at WebCo, in addition, distinguished between interactivity as a feature respectively of products being developed for clients and of their own tools in the development process. One of the site developers advanced unpredictable responses as a criterion of interactivity. His browser, as used to surf either the internet or the company intranet, is his most interactive application, since “I don’t know quite, when I request something, what the next page is going to be, so that there’s more of a sort of dialogue than there is with the other programs.” Among these other programs, he counts PHOTOSHOP, in which “I know what kind of response I’m going to get.” The other site developer contributes another perspective, suggesting that interactivity may frequently be a feature of several applications in combination: “It’s an interplay of partly NOTEPAD in which you program and a web server which executes the program and a browser in which you view the result.”

In summary, the respondents particularly associate the terminology of ‘interactivity’ with computers and their various applications – Interactivity 1 as laid out in Figure 1 – while preferring ‘communication’ in reference to human-human interaction (Interactivity 3). This may be explained, in part, by the further distinction that they make between ‘information’ and ‘communication’ as different degrees or qualities of mediated interaction: Human-machine interaction can yield information, but only human-human interaction (even if computer-supported) offers the scope and depth of actual communication – although computer games and certain web applications may be said to reproduce or simulate some of these qualities.

The following section shifts attention from general categories and degrees of interactivity, toward particular similarities and differences which respondents ascribe to their main media of communication at work, including face-to-face conversation. Accordingly, the analyses begin to look in more detail at the arguments being mobilized to explain or justify the choice of particular media and communicative practices.

Interactive Media

E-mail

E-mail emerged from the interviews as the medium of choice for contacting others at work, a “super intelligent and super simple” medium of communication. Among its recognized ‘intelligent’ features is speed, in addition to the simplicity of sending information and receiving responses, as well as the possibility of contacting people at a distance and many individuals with one message. In this regard, e-mail might be said to qualify as an ‘interactive’ medium, offering ‘something in return’ and supporting an ongoing dialogue with others.

Among the specific organizational uses of e-mail, the respondents mention, first, the distribution of information relating to a meeting in a timely and precise manner. The head of the BanCo internal education department substantiates the need for e-mail as a support medium as follows:

I head a group of ten people, and there’s much information that would take up time at a staff meeting where we’re eleven people using each other’s time, and

which I have distributed via e-mails, so that people themselves may sort through a little what they're most interested in.

Second, e-mailed attachments appear to be considered preferable to placing materials on a company intranet, especially if the attached files are short. Similarly, e-mail may be preferred for relaying brief, factual information. A site developer at WebCo mentions that this is the case, for example, for "technical information, such as links, bits of program code, and so on [...] where syntax is very important."

Third, also in relation to clients and other external relations, e-mail is considered the natural medium of continuous contact. The communications consultant at WebCo argues, in addition, that communication with clients has particular tactical purposes, which e-mail can fulfill:

[...] to me, e-mail is an extremely tactical medium in the sense that I can, I know when to send my mails to as to accomplish particular things regarding a client project, when is the right time to send off different kinds of mails.

In comparing e-mail to other media, several respondents reflect on the extent to which various technological media have been taking over the role of conversation, meetings, and other face-to-face communication. One of the site developers argues that e-mail:

is probably the primary form of communication in-house, you'd have to say that. There are some meetings, and we still talk a little person to person as well, but that's because we have an open office setting, you know. If we didn't have that, I think, there would certainly be more mails [...].

The same respondent finds that although he can call out to colleagues in the open setting, a mail makes the message "official," for example, if lunch is late, or, more seriously, if employees are requested to keep a tab on the hours that they spend on different tasks.

Finally, examples are given that an interaction with a colleague is accomplished, not with one, but with several media in combination. Media may complement each other; they may also jointly – as a 'multimedium' – serve one purpose. As the section on telephones below illustrates, a telephone call requests immediate information, whereas, as one of the site developers says, one sends an e-mail "if it can wait an hour or two" – in itself a relatively short latency period. The other site developer, further, describes a practice of letting e-mail and telephone work together:

[...] if people have something that is important, they will typically call ahead or afterwards and say, I sent you a mail, could you take a look at it [...].

Face-to-Face Conversation

Despite the prevalence of e-mail, conversation remains an ingrained element of daily life in the two organizations. For one thing, some respondents, for example, one of the secretaries at BanCo, still "mostly work person-to-person." Moreover, while, for her, e-mail can serve as "a short version," other respondents agree that, in a variety of contexts, "I still think there have to be people [...] not just computers."

For another thing, 'conversations' come in many shapes and forms. Beyond multiple more or less informal exchanges with close colleagues, interpersonal communication also enters into formally structured meetings, planning sessions, and other collaborative efforts. The particular interdependence of face-to-face and mediated communication is emphasized by the BanCo's head of education with reference to the use of virtual workspaces in the form of LOTUS QUICKPLACE:

[In our] QUICKPLACES, we try within a project group to start out spending time together, although it costs money traveling around, and then sort of establish a framework of our cooperation, and we have looked each other deep in the eyes, so that we know what we mean when we do such and such and say such and such. And then we can keep going in QUICKPLACE [...].

Also for smaller groups collaborating, interpersonal exchanges are described as qualitatively different and strategically important for getting the job done. The WebCo communications consultant comments that “there’s an incredibly good culture here of sparing on jobs, coaching each other regardless of management hierarchies, “ exemplifying the practice thus:

[...] if you have new projects, then you typically use each other to go into a room like this one, for example, and do different kinds of brainstorming sessions, and then the one responsible, so to speak, for the actual project goes back and writes it up, and then you can present the material once again to each other, I mean, people are also very, very good in precisely that kind of situation to refer to related materials [...].

The respondent does add that this practice also benefits from the geography of the company. In contrast to an earlier period, before two web companies merged into this one, the departments of design and usability now are located next door to each other.

Finally, the controller at BanCo suggests that several advantages of face-to-face and mediated communication may be combined in the future through the use of videoconferencing on a wider scale (a position that is challenged by others below with reference to future perspectives). Not only could this cut costs, he argues, but it might also strengthen the interactive aspect of communication:

I would hazard a guess that our travel activities could be cut by 50-60 percent as the availability of videoconferencing becomes [more common], and that we become more familiar with it. THAT’S [emphasis] interactive.

Telephones

The telephone, as noted, is a medium of immediate response, as compared to e-mail. However, these respondents suggest that, in daily work routines, telephones have become less important, also for in-house communication: “I think that nowadays you send more e-mails than you make phone calls, certainly,” said one site developer.

For some tasks, the telephone still serves its purpose. The other site developer, while noting that phones “are actually used rather infrequently,” draws attention to the importance of telephones in cultivating external relations since some clients prefer to speak on the phone. Internally, as well, phones allow for a more nuanced communication about complex assignments “instead of having to write a longwinded report.” This is particularly true if the matter is urgent and “one doesn’t feel like running to the other side of the building.”

It should be added that mobile and stationary telephones are described as having different profiles in terms of their typical or appropriate uses. Although this may follow, in part, from different pricing structures, making for shorter mobile phone conversations, the two technologies can also be seen to symbolize and entail distinctive social forms of communication. The head of usability at WebCo describes his two sets of expectations in the following manner:

If I call somebody on a stationary phone, [...] then it has an entirely different, relaxed feeling. I may have a purpose in calling them in the first place, but I can normally take my time, whereas if I call somebody on their mobile phone, then I'm normally ready to give a relatively short message or make an exchange since I don't know where they're at [...].

As part of the comparison, the same respondent suggested that e-mails and stationary telephones are similar insofar as one is not sure of making immediate contact. In contrast to this "oldfashioned world of telephones, [...] today we can get hold of people via the mobile phone if we really need them."

Web Applications and Other Shared Resources

Among their more or less interactive media at work, the respondents also commented specifically on interactive web applications and other shared resources. Whereas BanCo has used QUICKPLACES (QP) as a tool of inter-Nordic cooperation after the fusion of several banks into one, the WebCo respondents exemplified their uses of local-area network (LAN) drives and an intranet.

In the present sample, only the respondents from BanCo have had experience with actual interactive web applications, which "mediate interactions among multiple distributed actors who are not only users, but also designers in the sense that they contribute to the system's structure and content" (www.diwa.dk, accessed November 1, 2004). One of the secretaries recognized the QPs, alongside the BanCo intranet, as examples of interactive tools, the difference being that the QPs are dedicated, password-projected facilities, whereas the intranet is accessible for all employees. Others at BanCo were more skeptical. The head of internal education finds that QPs are not really very interactive, although they can support interaction within projects across different national computer systems and, hence, complement these. The BanCo controller goes further, arguing that this form of file sharing is not "sincere." In his view, a sincerely interactive application would imply a shared LAN drive, rather than files being downloaded to individual workstations and uploaded as part of a version-tracking process. Moreover, in his experience, the discussion groups regarding confidential materials which had been advertised as an important potential of the application, simply have not been used.

At WebCo, the communications consultant refers to a shared drive with presentations and other sources, including correspondence with clients, which may be used as a resource and recycled throughout several projects. To him, this resource, on a par with brainstorming meetings, is an important element of an open collaborative culture. At the same time, a key challenge is how to make this resource accessible, searchable, and applicable – how to transform potential information into actual communication and interaction. The consultant does worry that not all relevant information is being shared this way. More critically perhaps, his narrative of how sharing comes about, suggests that users will have to rely on word-of-mouth in order to navigate the resource:

So we use that a lot and then, in contrast, we also use one another a lot in order to get to know, 'have you worked on something, is there something on the drive that's relevant for me to take a look at,' for example, if I were to start a design process for a public authority, well, then I'd ask my colleagues, 'have any of you done something recently' [...].

Moreover, the two site developers at WebCo refer broadly to the intranet as a set of shared resources, as a "knowledge base" in addition to its news, calendars, and other facilities. New insights that have been published here, can next become the topic of fur-

ther discussion in various newsgroups – apparently, however, only among the developers at WebCo. They note an additional benefit of intranet servers, namely, that these are not as “obtrusive” as e-mailed attachments. Still, as in the case of presentations that may be made available to others and reused, the dilemma remains: which information, and how much, to make available to which collaborators, and, not least, through what structures of access? In some cases, then, colleagues come to serve as ‘media’ or ‘plug-ins’ that make the intranet system operative, or as unwitting gatekeepers who may in fact block access to a common resource.

One of the site developers, finally, elaborates how there may be a fine line between traditional web sites and certain more interactive web formats. His argument is that some web interfaces are becoming more comparable to software applications. His supporting example refers to “a web site [that] almost behaves as if it were an application”:

[...] if you have to report a traffic accident, for instance, to your insurance company, and you have to draw the scene of the accident, I would consider that somewhat more interactive than an ordinary web site, you know.

The same respondent immediately goes on to refer to communication between several users of a web site as another instance of interactivity. Once again, like the reference to a genre such as computer games, these examples indicate that the respondents’ notions of interactivity are being fed from a variety of sources within the workplace as well as outside.

To recapitulate, while the respondents do refer to conversation as integral to daily work, e-mail in particular is described as taking over coordination and collaboration, to the point of becoming the main medium, also in preference to telephones. With reference to web applications and other shared resources, which might offer versatile alternatives to e-mail, an argument emerges that these applications do not deliver sufficiently accessible and applicable resources in getting one’s job done. In addition, the respondents suggest that, to some extent, it is the combination of several media types into one ‘multi-medium,’ rather than single applications, which merits the label ‘interactive.’

Even though, as noted in the previous section, the respondents associate the terminology of ‘interactivity’ specifically with human-computer interaction, it thus appears that, in work practice, interactivity may be facilitated by various configurations of the agent-medium connection – Interactivity 1 as laid out in Figure 1 – depending on the task at hand and its embedding organizational structure. The next section goes on to consider the respondents’ understanding of this last aspect, their interrelations with other individuals and organizational units (Interactivity 3), as mediated in part by computers, as well as their more general conception of how different media serve to constitute the ‘organization’ of which they are a part (Interactivity 2).

Interactive Organizations

My Tool

A common metaphor regarding the place of computers in work which is offered by respondents at both BanCo and WebCo, is that of a tool – rather than, for instance, a partner or a medium. It may be an advanced tool, but a tool, “like a pen,” nevertheless. Further, it is indispensable for getting one’s job done, as defined always by organizational rather than technological criteria. Against this background, ‘too much’ interactivity can, in fact, be counterproductive because it might interfere with predefined aims. One of the site developers argues:

I don't think there's that much of an interplay maybe in what I do. It [the computer] has to do some things that I tell it, I don't need to be given a whole lot of options, I don't.

Because computers are a special, cumulative kind of tool, the communications consultant at WebCo, for one, worries that, instead of "having a library" in a traditional sense, he has himself "collected my library on my computer":

[...] once in a while I do worry whether the machine is going to break down, you know, because that would clearly be like eliminating a big part of your own KNOWLEDGE [emphasis] and at the same time also eliminating part of your own history [...].

In this context, 'history' is understood within a time frame of three years and of presentations dating from this period. Others, again, relate the tool aspect to matters beyond the workplace. One site developer simply notes, "I can do everything, and I do everything," exemplified by shopping, paying bills, watching movies, and taking care of his tax forms. The WebCo head of usability adds that his computer is an important "social tool" and that "I associate feelings with being connected to the outside world through my computer," including family and friends. Perhaps for this reason, "I get annoyed with it in exactly the same way that I get annoyed with my car when something's wrong with it, because I don't understand either one." What is referred to as a (social) tool, thus, also appears to be understood more generally as a medium of contact.

Organizational Units

Beyond human-computer and human-human interaction at the individual level, a crucial component of organizational communication is how different units and levels of an organization relate to each other, in part through its media infrastructure. As already noted, e-mail is ascribed a special role as a simple and convenient means of coordinating tasks across physical distances as well as between units of the organization. This also applies to WebCo, despite the relatively small size and the physical proximity of its various departments. In addition, at BanCo, respondents argue that an awareness of belonging to one department within a larger structure may be promoted through the intranet. As one secretary observes, "each department actually has its own homepage, and that's, you know, the way that you could say that they have an interplay with other departments." Also, as a reminder that not all work at BanCo (or WebCo) is centered on information and knowledge, this secretary explains how they depend on the intranet, in part, because "that is the only way of ordering supplies." In some respects, however, the relevance of information that is made available via intranets might be questionable. The controller at BanCo finds that, for instance, the finance department:

make it possible to retrieve all kinds of strange things, more or less useful. [...] maybe they should consider pulling the plug and see how much gets to be read. That's also, you know, the disadvantage [...] the possibilities are endless, so to speak.

However, relations between the units of an organization are not necessarily media-specific or media-dependent in a narrow sense. Interactivity in the sense of individuals and departments working together (Interactivity 3), is embedded in and anticipated by particular organizational structures, even though these structures only become manifest at intervals, for example, in the shape of media serving as supporting vehicles of commu-

nication. The head of internal education at BanCo, in particular, develops this argument with reference to how his unit offers its services to the employees of the bank:

[...] we have continuous, established relations so that we ensure that employees have the competences that they need in order to look after their jobs [...] plus some small projects are established when they are needed. [...] our customers, that's all the employees, and there are many of those.

Concerning supporting media, he notes that e-mail and calendar functions are used to coordinate activities, but that the communication with employees in terms of actual training takes place face to face.

At WebCo, several comments focus on the structure of communication between its several departments, or rather the lack of such a structure. A site developer finds, with reference to the design and usability departments, that “they mostly mind their own business [...] so we don't talk that much to each other.” The communications consultant explicitly argues that what he sees as a downsizing of internal communications has been “a big mistake.” Interestingly, in considering ways of promoting more coordination, the WebCo respondents refer not to media technologies, but to more face-to-face coordination between as well as within departments at meetings. The criticisms and proposed solutions also tie in with the question of management, which may be more or less interactive.

Management

Given the rather different organizational placements and professional tasks of this set of respondents, it is not surprising that their accounts of interaction with management differ. The head of internal education at BanCo and the communications consultant at WebCo give examples of how they frequently and freely have conversations with top management. At WebCo, this presumably has to do, in part, with the relatively small size and informal organizational culture of the firm; the consultant comments (positively) that the CEO “can't keep his hands from projects.” In comparison, one of the secretaries at BanCo explains how she gets all her information from her immediate superior, and emphasizes that he “weeds out what we don't have to know, and we get what we need. And we never miss any information.”

When it comes to the media for interacting especially with top management, the respondents at BanCo describe a standard procedure of relying on print or simply personal appearance, commonly supported with documents. In some cases, the telephone may serve as an alternative to face-to-face conversation. In contrast, e-mail seems to be a medium of choice, also at BanCo, for relations with one's own boss as well as with peers. One implication for further research is whether this balance in favor of face-to-face and print over electronic communication by top or strategic management, which seems surprising, may be found in other organizations, and whether this may change in the future.

The head of education also reflects more generally on the relationship between organizational structures, including the management hierarchy, and the degree of interactivity which a given media application – or a meeting format – ought to make possible. His argument is that interactivity is a means to an end, as defined by organizational needs:

[...] whether or not one wants a great deal of interaction, I mean, that decision has been made somewhere else, because here one uses what is available, and one is not able to influence, ‘would I like a little more interaction or not.’ of course, in the education department [...] we have sort of decided on a level of

interaction for our employees. I mean, that's based on what we find is right in pedagogical terms [...].

Whereas this respondent simply notes that "this decision has been made somewhere," at WebCo both the communications consultant and other respondents question what they perceive to be one-way communication by top management – performed at monthly meetings where management reviews the state of the economy, while some employees present ongoing projects and new initiatives.

External Relations

One additional aspect of organizational communication is the set of interrelations which an organization will seek to maintain with other organizations as well as with the public at large, an aspect that remains relatively underresearched (Cheney & Christensen, 2001: 231; Finet, 2001: 270). While focusing on internal communication, the interviews briefly addressed the respondents' understanding of such external relations and the place of media in maintaining them.

First of all, organizations mostly aim to speak with one voice. The head of education at BanCo remarks that "we're such a big corporation that we do not on principle make statements to the public." This, instead, is the task of a dedicated communications department, just as a national interest organization for banking and finance will address more general issues on the bank's behalf; external entities, by the way, are also understood as sources of information that can be placed on the intranet and have potential use value, for instance, for the education department. The same respondent adds that his department from time to time contributes information to the CEO, who then appears as the external communicator in press releases or specific media. Similar distinctions are made at WebCo, with reference being made, on the one hand, to clients as key external relations and, on the other hand, to the general public. The latter will be addressed in times of either crisis or success, at WebCo not by an internal department, but with the assistance of an external public-relations agency.

In addition to such specific efforts at interacting with the wider social setting, the respondents articulate an ongoing awareness of how others perceive the organization, in response to its external initiatives and activities incrementally over time. At BanCo, a secretary refers to the much publicized spread of e-banking as an important element of what people generally associate with 'being a bank'; the controller concurs that banks are recognized as being on the cutting edge of technological developments in society. In addition, the secretary finds that the posting of the bank's annual report on the public internet bears witness to its digital media profile. At WebCo, the communications consultant notes, more specifically, that the company is perceived, and perceives itself, as having a 'public-sector' profile. Although the implications of this orientation toward a larger public through various media at both organizations are difficult to assess, it presumably frames daily practices, to a degree, and contributes to the identity of employees vis-à-vis their 'significant others' both inside the organization and outside (Mead, 1934).

Family and Friends

It remains to briefly note that, like the respondents' computer uses in private, their personal lives as such have a bearing on work, including their understanding of interaction and communication. A secretary at BanCo argues that she personally is comfortable working with a computer, at work as at home. This is in contrast to acquaintances who "simply don't want it in the house," and who worry about children being influenced or

controlled by computers. She will limit herself, once in a while, after she and her husband have returned home, to complaining about “sitting in front of a computer all day.”

The head of usability at WebCo, in presenting a highly articulate view of the work-home relationship, offers additional narratives of living with computers in an everyday that is characterized by a complex set of obligations and opportunities. As part of his e-mail client, he relies on a sorting function so that mail from his friends is placed in a separate file. In addition, the system also signals the arrival of private mail by a different font type: “that makes me happy in a different way than when there is some ordinary mail in the in-box, you know [laughs].” Just as “I may log on at home and go to work for half an hour or five minutes,” he may “log out of my work life in here by reading a private e-mail or checking out a web site that my girlfriend suggested that I look at.” Despite the technicalities, the two worlds coexist, certainly in his head: “it’s my life!”

In sum, the computer is referred to explicitly as a ‘tool’ in the context of work, colleagues, and the organization as such, but, like other media, it comes across as quite a flexible resource that is adaptable to a range of social as well as personal uses. On the one hand, media serve as instruments for concrete work tasks; on the other hand, they also feed the employees’ cumulative awareness of the organization and its surroundings as well as their readiness to act within and on behalf of the organization. In this regard, media and the communicative practices that they support could even be seen as the primary manifestations of the organization (Taylor & Van Every, 2000) – a special case being management, whose apparently limited reliance on technological media calls for further research. Thus, Interactivity 3 – daily work within the agent-structure connection of Figure 1 – is enabled by a variety of media uses (Interactivity 1), and the media infrastructure is one necessary condition for the maintenance of the organizational structure (Interactivity 2).

The Best, the Worst, and the Future

This final section provides a concluding perspective on the potentials of interactive media, as understood and experienced by these respondents. Not surprisingly, their arguments and narratives regarding situations in which computers and other media really served their purposes (or not), as well as specific criticisms and predictions, center on the media as concrete artifacts (Interactivity 1), but their accounts also carry implications for the organizational embedding and social uses of interactive media.

Most basically, respondents in various positions at both BanCo and WebCo reemphasize their dependence on the computer as a tool, recalling incidents of being unable to work because of a power failure or a server malfunction. Also situations in which either a terminal or a network connection seems to respond too slowly, provoke criticism. One of the site developers presents the following argument concerning the respective roles of computers and humans:

A computer should never be slower than me. It should always be faster than me in doing certain things. If I click on something, it has to come up at once. [...] I shouldn’t have to wait for a computer, I don’t understand why I should. There is no reason why I should.

Beyond the technical capacity of their information and communication systems, the respondents express their special resentment of various kinds of irrelevant information. In seeking a particular item of information on a web site, the BanCo head of education notes, “I get sick and tired of all those pop-up windows,” and he argues that he may, as

a result, decide to seek the information elsewhere. With specific reference to the phenomenon of spam, one of the WebCo site developers suggests that this concept includes not only unsolicited advertising and other information from strangers. From the recipient's point of view, there may be thin line between, on the one hand, such structural features of computer-mediated communication as pop-up windows or spam campaigns and, on the other hand, some colleagues' indiscriminate e-mailing, what the controller at BanCo refers to as "a shotgun approach" to communication.

A more general phenomenon of 'overload' was introduced and elaborated by the respondents. Several reflected on the mixed blessing of having access to ever more information and communication. The head of usability at WebCo summed up the overload experience metaphorically as "being at a reception around the clock." Further, he related the story of a colleague "who was shocked when he turned on his mobile phone to check his mail on a Sunday night [and] then suddenly there's a call from a frustrated customer." Unless one takes precautions to the contrary, access to information may imply communication from others – interactivity works both ways.

The respondents also comment on positive, even superlative experiences with computers. One of the site developers recognizes that, as a user, one only notices when the system is not working, and that one's threshold of tolerance may be lowered when working with computers a great deal. The challenge, according to one of the BanCo secretaries, is to arrive at the right balance between flexibility and support, allowing users to navigate their own course and offering various help functions if they get lost. If a balance is struck, the WebCo head of usability sometimes feels, "the computer disappears," a condition also advocated by Norman (1998). In this circumstance, the user may be said to interact 'directly' with the system, and can accomplish the task at hand "without the tool getting in the way of the task." In other situations, the same respondent notes, he feels "great joy" when he has the opportunity to explore what an application such as a spreadsheet can actually accomplish. Such user experiences might be compared to the experience of 'flow' (Csikszentmihalyi, 1975) in becoming one with, for example, a mechanical tool or with the events of a sports competition. As a result, "I almost end up spending more time on the tool than on the task."

In the end, regardless of whether the technical system is operative and whether the person at the other end appears to be responding in a relevant manner, the controller at BanCo reflects that one may still wonder whether the interaction works in practice, "whether the message has been understood at the other end." Perhaps information is being passed back and forth without resulting in communication. At issue are not merely the technologies and the social skills available, but also the very condition of technologically mediated communication. The wider implication is a presumably healthy skepticism regarding the concrete value of technological media. In his experience, "if you're sitting face-to-face with people [...] many will at least be more honest that they don't understand and say, 'I don't understand what you're saying.'"

Thinking ahead about their future with computers, the respondents introduce two main work-related considerations. First, one of the BanCo secretaries expresses genuine concern about the possible loss of jobs as computers take over more tasks. On the one hand, "you can't stop the future" and "you have to keep up." On the other hand, she reassures herself, "there has to be someone to control those machines." Perhaps social agency and interactivity ultimately arise from humans.

Second, the head of education discusses a related, if rather specific issue, as seen from a management perspective. In his experience, the question of how to integrate on-the-job training in a workday poses somewhat of a dilemma. On the one hand, it might

be better to send off the employee somewhere, because “if you are in the workplace, well, then people will come and grab the person anyway even though the person in question is training.” On the other hand, he prefers the argument that the flexibility is higher, and the cost lower, in the workplace. Whereas distance work enables people to accomplish similar tasks in two locations, on-the-job training, at least ideally, accommodates different tasks in one location.

Looking beyond the workplace, the respondents draw freely on a variety of examples in order to indicate their preferred or likely futures with computer media. Several anticipate and applaud more e-business in the form of daily shopping; more personalized services for interacting with public authorities or one’s doctor; and a universal system of digital signatures. One potentially divisive issue is the introduction of more webcams and other visual media of communication. Some respondents refer to, for example, videoconferencing as a way to limit travel. However, the head of usability at WebCo argues in some detail that this is likely to be useful only in specific work settings: “we also need to move around a little at home in our underwear.” One of the site developers adds that the issue of privacy extends to cookies and other tracking mechanisms; there ought to be limits to how much information may be collated on the consumption and communication habits of specific individuals. Also in a legal and political sense, ‘interactivity’ might be in need of specification: As suggested by Lessig (1999), digital codes imply social laws, sometimes by default.

Especially the IT professionals at WebCo present projections on what communication systems in the future will look like. One of the site developers refers to the implications of ubiquitous and pervasive computing. In response to a question concerning an ideal form of interactivity in the future, he replied: “That would be if we don’t have computers. [...] sitting down at a computer. It’s a bad habit we have, and I hope it goes away soon.” Concretely, he refers to omnipresent and multipurpose terminals as points of access to a central computing resource.

Nevertheless, in view of the systems currently available, there may be a long way to go for the ordinary user. Several respondents consider the problem of how to interrelate different elements and functions, not just of one’s own computer, but of the organizational infrastructure. Addressing this problem, the communications consultant implicitly returns to the early history of personal computing, calling for the development of some “self-referring” and “self-reflexive” structure. Vannevar Bush’s Memex (Bush, 1999 [1945]) remains the prototype of such a customized and integrated information and communication resource, as extended here from the personal to the organizational level. So far, according to these respondents, interactive web applications and intranets have not delivered that solution in practice.

Conclusion

This exploratory study has examined what ‘interactivity’ might mean to people relying on various types of media in their daily work. Departing from widespread references in both research and public debate to the coming of more interactive media forms, its main aim has been to tap the ordinary user’s perspective, focusing on organizational contexts. As basic research, the interview study provides grounded (Glaser & Strauss, 1967) descriptions and illustrations of how three theoretically conceived aspects of interactivity are experienced and enacted in practice. Qualitative empirical studies, while commonly recognized as sources of theory development (Denzin & Lincoln, 2000), may be of particular relevance for understanding how highly flexible and adaptable information and

communication technologies are contextualized and contribute to the emergence of specific forms of social organization.

Several of the categories that the respondents articulate and illustrate – ‘interactivity,’ ‘communication,’ and ‘information’ – as well as their accounts concerning the prominence of different media forms in different work practices, lend themselves to survey-based research on a representative scale, in part to facilitate an informed adoption and integration of ‘new media’ in organizations (Rice & Gattiker, 2001). The findings also identify a number of issues for further qualitative studies. First, the respondents’ descriptions, arguments, and narratives indicate that ‘interactivity’ may be the practical outcome of the simultaneous use of several software applications, and of several media, as one ‘multi-medium,’ rather than a characteristic of the structure and operation of a single application. Second, some of the accounts of shared resources, for instance, via an intranet, imply that there are unresolved questions of how to access, navigate, and apply such resources – through operational search functions or by relying on collaborators as ‘media.’ Third, the accounts of management uses of media begin to suggest what may be a distinctive ‘non-technological,’ if effective practice, which should be examined in other contexts. Finally, both the respondents’ introduction of computer uses outside the workplace and the references to commercial ‘hype’ regarding interactivity, serve as reminders that their understanding of information and communication technologies has been informed by a number of sources, and that the ongoing formation of this understanding should be studied, as well, with reference to the wider social setting of which employees and organizations are a part.

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Appendix 1. Interview Guide and Transcripts

Interview guide

- People who work with computers sometimes use the expression ‘interactivity’. What does that expression mean, as far as you are concerned?
- Some people also talk about ‘interaction’ or about ‘communication’? What do those expressions mean, as far as you are concerned?
 - [optional follow-up questions]
 - Do you think there can be different degrees of interactivity?
 - Do you know others, for instance colleagues, who perhaps use these expressions in a different way?
 - Do you have family or friends who use these expressions – how?
 - Have you met expressions such as ‘interactivity’ in media and public debate?
- Some people pay attention to the relation between humans and machines when they talk about ‘interactivity.’ How would you describe your relation with your computer during a workday?
 - [optional follow-up questions]
 - The best possible
 - The worst possible – whose fault is it?
 - Are there particular applications or programs that you would describe as particularly ‘interactive’?
 - Do you see your computer as a colleague or partner?
- Some people also see their relations with colleagues – for instance via e-mail – as ‘interactivity.’ How would describe your relations with colleagues during a workday?
 - [optional follow-up questions]
 - What difference is there between having contact face-to-face, via the telephone, via e-mail, via XXX [a relevant application in the organization in question] ?
 - Is there a difference between your relations with colleagues nearby and in other parts of the country or the world?
 - Have there been changes in your contact with colleagues in recent years?
- We have also talked to some people who find that there is a kind of ‘interactivity’ going on – an interplay – between different departments of their company, and between the company and society around it. What do you think of that idea?
 - [optional follow-up questions]
 - Are there other departments that are particularly important for your daily work? – What kind of contact do you have with them?
 - Do you have an interplay with management? – What kind of contact?
 - Do you have an interplay with other companies?
 - Do you have an interplay with the general public?
- People sometimes express great hopes that computers will promote more interactivity in the future – on the job, during leisure, and in society at large. Try to imagine the best possible kind of interactivity – what would that look like?
 - [optional follow-up questions]
 - No technical or financial limitations!
 - Do you have colleagues or acquaintances who have different views?
- Would you like to add anything about interactivity?

Transcripts

The translation of interview quotations into English has been made by the author. On transcript notations, see also Jensen (1998).

Appendix 2. Organizations and Respondents

BanCo

A large Nordic corporation in the area of banking and finance; the outcome of a merger in 2000, which, among other things, generated a need for additional resources of information and communication.

- B1 – head of the department of internal education (male)
- B2 – controller (economist) (male)
- B3 – secretary (female)
- B4 – secretary (female)

WebCo

A medium-sized web development company; the outcome of a merger in 2000.

- W1 – head of usability department (male)
- W2 – site developer (male)
- W3 – site developer (male)
- W4 – senior communications consultant (male)

Appendix 3. Sample Data Analysis

A familiar issue in qualitative research projects is how to document analytical procedures and substantiate inferences from data within the confines of journal articles and book chapters. Compared to the tables and models of quantitative survey research, for instance, qualitative findings mostly do not lend themselves to cumulated and standardized formats. In the body text of this article, the emphasis is placed on reporting substantive findings regarding the respondents' terms, concepts, and practices concerning interactive media at work. Here, the underlying approach to three key features of interview discourses is illustrated briefly (for a full-scale application, see K. B. Jensen, 1986).

Semantic categories. Semantics – the study of meaning – offers analytical means of access to people's 'ideas,' 'opinions,' and 'worldviews,' as expressed in language (Corley & Kaufer, 1993; Lyons, 1977). Addressing the notion of 'communication,' for example, one respondent offered the following definition:

Communication to me [...] is an exchange between two persons or two systems, if you like. Of course, it's pretty important whether you're talking about systems or not talking about systems, but anyway [...].

On the one hand, this definition emphasizes the very exchange between two sources of information or meaning as the distinctive feature of communication; on the other hand, it identifies an unresolved issue, for this as well as for other respondents, i.e., in what sense both humans and machines might be said to communicate. The data analysis aimed to establish such categorical distinctions and interrelations within and across the respondents' accounts of their media use at work.

Arguments. As noted by Jerome Bruner (Bruner, 1986), arguments may be seen as one of two basic modes in which people approach social reality, the other mode being narratives. Assertions, premises, and supporting examples all suggest commitments and priorities that bear on the respondents' engagement with people and media at work. Reflecting on the importance and value of his computer, a respondent argues that:

[...] once in a while I do worry whether the machine is going to break down, you know, because that would clearly be like [...] eliminating a big part of your own KNOWLEDGE [emphasis] and at the same time also eliminating part of your own history [...].

Two points, in fact, are being made. First, assuming that part of the value resides in the customized and cumulated structure of his computer (which may be difficult to back up), the respondent indicates that "his own" knowledge extends to this information resource. Second, this knowledge is understood, not just as instrumental information, but as a source of meaning, identity, and history, at least in a professional sense. In this regard, the respondents' arguments begin to suggest how the media they use relate to their understanding of self, collaborators, and the organization.

Narratives. Stories, finally, are told by respondents to clarify terms, exemplify arguments, as well as to elaborate on the contexts of media use at work. With reference to an experience of information and communication overload, one respondent introduced the story of a colleague:

who was shocked when he turned on his mobile phone to check his mail on a Sunday night [and] then suddenly there's a call from a frustrated customer.

The narrative, among other things, draws attention to the fact that accessibility and interactivity pose problems as well as potentials in the design and use of media systems.