

# Preface

*Designing for Networked Communications: Strategies and Development* is a book about how we plan, use, and understand the products, dynamic social processes, and tasks upon which depend some of the most vital innovations in the knowledge society—social as well as technological ones. Focusing on various forms of design, implementation, and integration of computer-mediated communication (CMC), the book bridges the academic fields of computer science and communication studies. In this way, an interdisciplinary approach allows us to substantiate the overall argument of this book: The successful designing, integration, and adaptation of networked communications must involve users and actors at all stages of the development process, from the first outline of a strategy for the designing of systems and artefacts to the manner in which they are finally integrated and merged with existing practices, technologies, and media.

Managing complex processes such as these requires the development of strategies that will take into account some of the problems and processes, which can be anticipated. As will be demonstrated repeatedly in the chapters to follow, it is essential to further our understanding of such processes by identifying strategies employed by both developers and users in the dynamic processes of creating and using artefacts and systems. This book contributes substantially to answering some of the questions that arise from such *challenges*, as it presents the findings from well-documented research projects and in-depth studies of organizational work practices and learning environments.

## The Challenges

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*Networked communications* are proliferating. Today, not only are existing mediated forms of communication being remediated in electronic form (Bolter & Grusin, 1999), but also hitherto direct forms of communication in complicated social settings are being supplemented or even replaced by computer-mediated communication (CMC). We have come to depend on CMC products. As a result, the way they function and the way we use them inevitably influence or even determine how we communicate and how we think about communication. Thus, the continuous designing, integration, and adaptation of systems and artefacts in support of networked communications has already brought about profound changes in the everyday life of communities and organizations. This is particularly pronounced if the organized activities of such units depend on knowledge intensive work and learning.

In the present volume, several chapters present research results that substantiate the notion that such changes in our ways of communicating often bring about various difficulties and barriers. This is especially so, if the introduction of new communication systems is technology-centered and conceived of as an end in itself—meaning that users and actors are not involved in the process, even if they are required to put the systems into practice. If no urgent demand for technological innovation is experienced, and if the benefits of rearranging existing work practices are not evident, then such changes may make no sense to the users and actors. Even worse, if the early phases of introducing new artefacts and systems make existing work practices more difficult, then strain is added to a workday that often is already stressful. At the time of writing, a number of these problems have been identified (Kyng & Mathiassen, 1997), and they are becoming well documented through research that is conducted partly in parallel to research in the area of general technology studies (Czarniawska & Hernes, 2005; Engeström, 2005).

Although similarities between production technology and networked communication systems are evident, so too are differences. Very often, technologies and systems, brought into practice in support of human communications, are treated in much the same ways as production technologies (Moran & Dourish, 2001). However, the difference is striking although surprisingly unnoticed. According to the still-prevailing sender-receiver conception of communication, networked communications are said to rationalize and inform work practices; virtual organizing and virtual teams may replace existing collaborative practices and traditions; information and communication practices are modelled as if they were infrastructures; communication and information flows are charted and depicted in terms of input/output systems; and signals are being “sent”—almost like information package deliveries (Dervin & Foreman-Wernet, 2003).

If one accepts such understandings, it may well come as a surprise when human communication actually works quite differently from what was anticipated. It seems that production does have the capacity to rationalize, replace, and reproduce.

Communication technologies, on the other hand, are apt to produce even more communication. Networked communications systems and technologies produce rather than replace communication, increase rather than rationalize, and reorganize and transform rather than reproduce. If one is strategizing without taking into consideration such differences, then it will come as a surprise that virtual universities, distributed virtual organizations, globally “located” enterprises and businesses face serious problems due to the confining “production-technology” conceptions of human communication practices (Dourish, Grinter, Dalal, Delgado de la Flor, & Joseph, 2003).

New technologies and new media generally attract attention, in both popular *litany* and in reflected *systemic* understanding of technological and social development (Inayatullah, 2002, 2003); they almost invariably are assumed to represent improvements. Thus, when brought into practice with a one-sided focus on what is new, they tend to overshadow “old” ways of communicating. Thorough studies of organizational work practices, however, show us that the use of new technologies and media is best understood and integrated into work practices if regarded as a complexity of interplays or *assemblages* (Latour, 2005) merging new and older media. In this process of merging, they are both remodeled and rearranged while being adapted to the practices and activities that they were designed for. The interplay between old and new technologies and media is, therefore, an important aspect to be taken into consideration by designing strategies.

In line with this notion of assemblage in the implementation and integration of tools for networked communications, the actual *designing* of such products may be understood as a cycle, where tasks require the creation of systems and artefacts, and where these in turn condition modifications of tasks (Carroll, Kellogg, & Rosson, 1991). The contributors to the present volume share the basic premise that the processes of designing and adapting must involve the active participation of the eventual users of communication systems.

To illustrate the breadth and complexity of the subject, we have chosen to understand the concept of *designing* in a broad sense covering both development and strategies, namely as: (1) the underlying scheme for the planning, functioning, and development of an artefact; (2) the actual arrangement and functionality of various elements of the artefact; (3) the development of strategies and adaptations required for performing tasks by means of the artefact in the given social context and subject to certain basic conditions; and (4) the development of creative strategies for social innovation and the identification of new tasks to be performed by means of a redesign of existing artefacts or with new artefacts.

Similarly, the complementary components of designing, for example, tasks and artefacts, are to be understood in an inclusive sense. The *tasks* discussed in the chapters of this book can either be interactive processes of communication between individuals by means of computer or telenetworks (within and across organizations) or the dissemination of information from a sender to a target group. The *artefacts*

range from a macro- to a micro-level, including networks, software, instantiations of systems, organizational frameworks, files, and even actual symbols being manipulated in the act of communicating.

On these pages, as in some of our earlier writings (Heilesen & Jensen, 2006), we may have introduced a slightly pessimistic view of the current state of designing for networked communications. Too often, it seems, the challenges of developing networked communications are underestimated or even misunderstood. But, of course, it should be recognized that this is a very recent and rapidly developing field in which the all-embracing and conclusive answers have yet to be devised. There are, however, a great many good beginnings, and we are happy to be able to present a fine sample of them in the present volume.

## **Organization of the Book**

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The book chapters are organized on the basis of three underlying themes:

- Organizational aspects and practices;
- Designing methods and principles; and
- Development of social conventions and interactions.

In 12 chapters, the authors of the book explore different instantiations of these themes, reflecting on the two complementary aspects, namely *strategies* and *development*. Although the importance and focus attached to these two aspects and three main themes do vary from chapter to chapter, we have decided not to organize the book into two, three or even six sections. Although you will certainly notice a progression from the first to the third theme as you read the book, we find it most natural not to impose too strict boundaries on the various themes and aspects. If we were to do so, we would obscure the fact that in most of the chapters more than one theme and aspect are in fact developed. This “overlapping” of themes and aspects only goes to illustrate the dynamic interrelations between organizing practices, methods of designing, and the influence of networked communications on human communication, conventions, and social interactions.

Below follows a brief description of each of the chapters:

Hanne Westh Nicolajsen and Jørgen P. Bansler, in Chapter I, *Evolving Information Ecologies: The Appropriation of New Media in Organizations*, examine how people in organizations appropriate new computer-based media, that is, how they adopt, reconfigure, and integrate advanced communication technologies such as groupware

or desktop conferencing systems into their work practice. Prior empirical studies of the introduction of new computer-based media in organizations have shown that appropriation and sustained use is often difficult to achieve. The chapter presents and analyzes findings from an in-depth field study of the adoption and use of a Web-based groupware application—a “virtual workspace”—in a large multinational firm. This study focuses on the fact that people in modern organizations have plenty of media at their disposal and often combine old and new media to accomplish their work tasks by adapting current genres and creating working configurations or assemblages of media with complementary affordances. Thus, the crucial role of organizational communication genres in shaping how people adopt and use new media is highlighted. The authors argue that understanding and facilitating the process of appropriation is the key to successful introduction of new media in organizations. The users of technology must play an essential role in this process because they have an intimate knowledge of the local needs and circumstances, and they are the ones who are required to change their behaviour and adjust to new technology. However, the enrollment of users and their active participation requires the necessary time to take part; users must be allowed to “play around” and experiment; and they must be provided with ongoing support and resources. This can, be organized, for instance, by creating a new position as *gardener* or *mediator*.

In Chapter II, *Incompleteness and Unpredictability of Networked Communications in Use*, Dixi Louise Strand explores the use practices of a Web-based information system in large, distributed pharmaceutical development projects. This study highlights the process in which the system in question is held together, extended, and transformed into a working system for pharmaceutical projects. Assemblage is proposed as a productive concept in making visible the particularities of networked communications, their malleability, and the way in which they evolve in use through extensions, interferences, and unpredictable circumstances. The author presents an understanding of networked communications in use and consequently draws implications for further development strategies for such technologies. Thinking about the evolving use of Web-based information systems as a practiced assembly can thus turn our focus to the practices in which skills, demands, resistances and problems, and benefits emerge and how they may differ from one place and time to the next. The author argues that the concept and themes proposed provide an antidote to existing studies and a tendency toward being overly concerned with explaining use patterns through structures or depicting use as a matter of human resistance to fixed technological characteristics embedded by designers. The examples presented in this chapter emphasize the importance of continual user support and training and suggest that existing experiences and experimentation might be incorporated in multiple cycles of professional redesign.

Chapter III, *Strategies for Organizational Implementation of Networked Communication in Distributed Organizations*, written by Keld Bødker, Jens Kaaber Pors, and Jesper Simonsen, presents the results from a longitudinal case study of the use and implementation of a virtual workspace product used to support communica-

tion in a large distributed organization. The authors observe how implementation contexts are quite diverse, and they identify six factors important for understanding the implementation of CMC technologies: management position and role, administration, membership, evaluation and redesign, work practice integration, and dependency. Combining two recent models for change management, the authors identify three types of typical changes—anticipated, emergent, and opportunity-based—at an organization/infrastructure level and a work group level. Relating change management models to the findings from the empirical study, the authors synthesize implementation strategies on the premise that the levels identified are mutually interdependent. The authors conclude that the particular characteristics of technologies for networked communication cause successive changes, including configuration and re-configuration of the technology used in local organizational contexts. In this light, the options for organizational implementation are further operationalized by identifying challenges, immediate expectations, and aims, as well as strategies to stimulate change beyond the immediate effects of implementing CMC technology.

In Chapter IV, *Participatory Design and Creativity in Development of Information and Communication Technologies*, Nette Schultz, Lene Sørensen, and Dan Saugstrup present a new framework for user-centered designing of ICT products. The basic idea is to involve users at an early stage in the process of developing ICT products. The methods developed for this purpose combine principles for participatory design, focusing on human values and team work, with creativity techniques such as brainstorming, picture simulation, and the setting-up of a creative environment. Creating scenarios to serve as the basis for communication between system designers and users, the authors implement such creative environments in the form of a sequence of design workshops, conducted for creative users and experts, respectively. Both kinds of workshops are observed to be helpful in generating ideas and in stimulating the creation of a shared design language, bridging the gap between the user focus and the technical focus typically to be found in development projects. In addition, the framework of expert workshops also helps to create the team atmosphere that is highly important to large ICT projects. The framework is applied and discussed using the case of the MAGNET mobile communication development project (My personal Adaptive Global Net).

In Chapter V, *Information and Function Chunks as Building Blocks in the Control Room of Life*, Georg Strøm proposes a new way of ordering and presenting information on the computer. His premise is that we continue to organize information on the Internet in much the same way as we did when information was distributed only on paper. As a one-time specialist in designing control systems for telecommunications networks, he notes that the situation of the Internet user, running several applications simultaneously on a complex and highly-dynamic network where changes occur constantly, is not that different from that of the control room operator who has to supervise several pieces of equipment and react instantly to changes. Both types of users need to organize information in a flexible way so as to reduce

both the cognitive load and the effort required for dealing with information. As a possible way to reach such a goal, Strøm proposes five design principles that are likely to help facilitate user interaction with net-based systems: (1) informing the user of all changes that may affect him or her; (2) dividing information and functions into chunks representing the smallest possible units of meaning; (3) automatic synchronization of navigation and parameters in the different chunks; (4) using views to give users access to chunks that are relevant to a particular task or in a particular situation; and (5) facilitating the pushing or pulling of a view from one terminal to another where it is needed. Strøm concludes that, while it is technically feasible to implement these principles, the heterogeneity of the existing networks, considerations of compatibility, and market forces offer practical obstacles.

Simon B. Heilesen, in Chapter VI, *A Short History of Designing for Communication on the Web*, establishes that Web design is important for how we communicate on the Internet, and also how it has an effect on computer interface design in general. In this chapter, the author examines the development and history of Web design as a prerequisite for understanding what it has become today. The history of Web design is outlined in terms of the complex interplay of various social, cultural, economic, technological, and communicative factors, and the outline concludes with the presentation of a framework for Web design. The author suggests that Web design may be facing major changes as the requirements of users and the technologies employed to meet them are changing. The chapter concludes by offering some reflections on the future of Web design. As the Web has become all-embracing, some conventions—and genres—have emerged, on one hand, making it possible for the trained user to recognize quickly the look and feel of common types of Web sites such as the corporate Web site, the news site, the fashion site, the e-commerce site, and so forth. On the other hand, the advent of Web logs, wikis, and similar social software are blurring the distinction traditionally made between Web publishing and computer-mediated communication, thus challenging the notion that Web design is something unique. Furthermore, the author concludes that we are just witnessing the early stages of pervasive, wireless networked computing, where Internet access will be integrated in all kinds of electronic devices. This development seriously challenges the conventions of Web design that have been developed in the first decade or two of the WWW era.

In Chapter VII, *Fostering Innovation in Networked Communication: Test and Experimentation Platforms for Broadband Systems*, Pieter Ballon, Jo Pierson, and Simon Delaere pose the question of how to foster innovation in networked communications by setting up broadband environments for joint testing and experimenting. The authors identify six types of test and experimentation platforms (TEPs): testbeds, field trials, prototyping platforms, living labs, market pilots, and societal pilots. The typology of TEPs is matched with the characteristics of real-life TEPs in three European benchmark countries, that is, Finland, The Netherlands, and the United Kingdom. By constructing this conceptual framework, the authors suggest that the creation of open platforms should further the interplay between business actors,

helping to tackle the systemic failures associated with broadband innovation. The authors argue that the strategic relevance of TEPs lies in the extent that networked communications are made possible between various public and private stakeholders—including users; in the establishment of a trusted setting that resembles real-life situations; and in supporting non-linear, mutual shaping innovation processes with semi-mature technology. The notion of networked communications is closely linked to many of the characteristics for differentiating TEPs. This refers to: the openness in results and partnerships, the objective of open innovation activities, the stakeholder involvement (technology producers, service providers, professional users, and/or private users), the real-life organizational setting, and the involvement of “medium immature” technology.

Based on their work at Coventry University in implementing a university-wide strategy of rolling out a learning environment, Frances Deepwell and Kathy Courtney in Chapter VIII, *Envisioning Potential: Stories of Networked Learning Designs from a UK University*, explore the ways in which new understandings of the potential of technologies in higher education may be developed and shared within communities within an organization. As well as emphasizing the importance of community-building and the creation of communities of practice in a networked learning implementation, a particular focus of the chapter is the way in which the design of artefacts and processes can enable these shared understandings of new technologies to spread within a complex, organizational context. The authors draw on their experiences of the managed introduction of the Web-based virtual learning environment, WebCT®, and apply techniques of narrative inquiry to aid their understanding. Deepwell and Courtney have explored the narrative accounts in terms of an overarching theme of “building shared understandings” which they have organized around three areas of their experience, namely designing for a community, developing a discourse, and developing artefacts. They argue that design decisions in these three areas have been highly significant in terms of the levels of acceptance and future direction of an online learning implementation.

In Chapter IX, *Reflective Designing for Actors and Avatars in Virtual Worlds*, Sisse Siggaard Jensen proposes a *virtual 3D exploratories* designing strategy by which to facilitate knowledge sharing and social innovation in organizations and work groups. The strategy will allow users to build virtual worlds aimed at exploration, and to interact and communicate with one another by means of avatars. To substantiate the designing strategy, the chapter discusses virtual phenomena such as avatar-based interaction and communication, and scenarios designed for reflective practices. As an empirical background, this chapter presents narratives and video-based self-observations from 12 experiential sessions undertaken as part of the international EQUeL research project involving the construction of a *Virtual 3D Agora-world*. The findings from the Agora-world sessions indicate that problems seem to arise in a process of remediation. With reference to her findings and a comparison with some of the general features of multi-user online role-playing games, the author observes that, first, a reflective designing strategy should emphasize the differences

between virtual and real-world framings to challenge existing ideas, notions, practices, expectations, and strategies. Second, that in communicating and interacting with avatars, actors also need a well-known framing in support of their activity. To address these challenges, and inspired by Brenda Dervin's "sense-making triangle", Jensen introduces a "designing triangle of exploratories" meant to serve as a thinking tool for the designing of virtual worlds for organizational knowledge sharing and social innovation.

Torkil Clemmensen, in Chapter X, *The Psychology of Online Sociability: Theory and Examples*, reviews current approaches to online sociability and presents the psychological *social reality theory* of online sociability while focusing implicitly on cultural models. The social reality theory is exemplified by analyzing sociability in a university-level, virtual world course. The author examines the question of how to understand the students' design of conditions for sociability as a communication of cultural symbols, such as avatars and virtual landscapes, and the social reality of perceived groups of people. The results from the analysis illustrate different kinds of online sociability: superficial, convivial, and negative sociability. The author concludes that the experience of sociability is an outcome of complex and culture-specific structures and processes. In practice, this means that planning the sociability of both products and dynamic social processes in a knowledge-creating context, such as a university course, only constitutes half of the design for networked communications; the other half involves understanding how people with different cultural backgrounds actually use the processes and products. Finally, the chapter provides solutions and recommendations to designers and researchers emphasizing that we need to understand different cultural practices in terms of cultural models for classroom performance, romance or flirt, collective movements, and so forth, both offline and online to design and support human forms of online sociability.

Jørgen Skågeby, in Chapter XI, *Designing Control of Computer-Mediated Gifting in Sharing Networks*, addresses the number of domains where sharing technology increasingly has come into use: open source software development, health care, self-fulfilling leisure activities, social networking, teaching, and research. It is argued that not only conversation-driven communication is of importance to end users, as the networked gifting of digital material indicates. The pro-social provision, or gifting, of goods in multiple user sharing networks is largely determined by the relationship that an individual has to the larger group(s) of which he or she is a member. This relationship can be both a conflict of interest and a pattern of cooperation reflecting a predicament of acting in self interest versus in the interest of the collective. The author outlines the relationship model to be used as a relatively stable determinant of types of gifting acts, and five dimensions of control are also introduced. Modeled in this way, the dynamics of sharing networks make gifting a continuous re-negotiation between reactive actions and overall tactics. The author claims that the benefits of studying and designing for gifting are several: it can help managers in supporting and sustaining communities; it provides designers and developers of services with a well-researched foundation for the design of

digital gifting; it creates transferable design conclusions to be used within domains with commercial or utility-based interests; and it makes service providers able to distinguish and evolve their services.

Finally, extending networked communication to include telecommunications (which are rapidly converging with computer-mediated communication), Louise Barkhuus, in Chapter XII, *Mobile Networked Text Communication: The Case of SMS and Its Influence on Social Interaction*, presents a qualitative study of the use among young adults of mobile text messaging (SMS). Based on a case study and drawing on the available literature on the social impact of mobile telephony, she discusses what effects the SMS technology has on social interaction. Focusing on how this new communication technology helps overcome shyness, how it is used for micro-grooming, and how it can be controlled by the user, the author illustrates how SMS helps maintain social relations and assists users in their activities. The author argues that SMS facilitates users in their everyday life through the ways it supports awareness and accountability, characteristics that make the technology socially translucent in much the same way as is the case with richer media. She concludes that simple information and communication technologies such as SMS may provide powerful tools in new designs of information and communication technologies.

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