Introduction

The work of a crowd is always inferior, whatever its nature, to that of an isolated individual.

Gustave LeBon (1895/1960, p. 200)

The release of productivity is the product of cooperatively organized intelligence.

Dewey and Tufts (1939, p. 446)

“Collaboration” and “cooperation” among individuals – the harnessing of people’s skills and talents to conduct projects, make decisions, and create new ideas – are notions that are both commonplace and elusive. The contradiction between the two epigraphs underscores the fact that controversies concerning the value of collaboration are not new. We have all participated in meetings and team projects, in informal exchanges as well as structured games, but these activities remain only vaguely understood and nearly impossible to predict and control with any precision. Our modes of individual and group expression (our “virtual individuals” and “virtual groups”) are intimately linked with the technologies that support group interaction – technologies that have undergone dramatic change in the past decades.

Network-based computer applications designed to support joint efforts (“computer-supported cooperative work,” or CSCW, applications) have both staunch supporters and fierce critics. Promoters have characterized these systems as “coaches” and “educators” (Winograd and Flores, 1986); critics, in turn, have labeled the same systems as “oppressors” and “masters” with a “digitized whip” (Dvorak and Seymour, 1988). The terms “groupware” and “workgroup computing” can be found in many computing, management, and social science publications, along with words of high praise, condemnation, or ennui. Virtual reality (VR) applications have been incorporated into some CSCW initiatives, sometimes compounding confusion about the systems and further steepening the learning curve.

There are sensitive ethical and value issues involved in development and use of CSCW applications. Controversies surrounding these systems center on issues of privacy, dependence, trust, and freedom of expres-
sion. Discussions about the “real” and the “virtual,” about the use of technology to shape our notions of reality, have also been heated. A number of ethical controversies involving these systems have centered on stated intentions of designers; others have been rooted in concerns about the systems’ possible unintended effects and implications. Many developers claim that their systems involve efforts to make human interaction more efficient and productive, as well as to modify the quality and structure of group activities in a variety of ways. Critics counter that we know little about how groups (even familiar, face-to-face groups) interact, which makes introduction of these technologies in workplace and educational arenas risky and possibly dangerous. Linkage of groupware to the Internet adds more concerns.

The tailored social universes that are emerging in the era of CSCW–VR linkages have merited special concern. In the worlds of entertainment and education, VR applications can serve to alter our senses of cause and effect, and of the permanence or continuity of objects, in order to thrill us or to reinforce some important educational points. Our commonsense notions of how gravity functions can be readily altered when we don VR equipment or work in environments that have been augmented with VR-related techniques; objects we drop can fall “up” rather than “down,” and disappear and reappear periodically. In a related fashion, VR applications can serve to alter our instincts and judgments about social interaction.

Basic assumptions about what it is to interact with others in a team setting can be modified in VR- and CSCW-enhanced workplace and social settings. For example, a certain level of “consistency” is a strong value in everyday social interaction; we generally do not expect the people we are working with in our work groups to alter radically the manner in which they look or talk. However, in the VR–CSCW environment, team members may find that sudden changes in their personal appearances and demeanors are not only socially acceptable, but perhaps required for adequate levels of performance in the group context. Such changes could be used to underscore important points, or to “shake up” an otherwise moribund discussion. Team participants can have a large assortment of images or sounds associated with them; they can also manipulate these images and sounds in ways that are not in keeping with the gender and age stereotypes that participants are normally placed in.

In this book, I develop a framework for discussion of social and ethical dimensions of network-based computer systems, one that can be employed in many aspects of application design and implementation. I begin with an analysis of the evolution of network-based systems, with an emphasis on the emerging genre of CSCW applications. This is followed by a discussion of the self and group: discourse on these notions is an
Introduction

An essential component of network-based system design and implementation. Tensions between individual-oriented and group-oriented perspectives are not resolved by technologies, but find new dimensions and outlets in them. I then discuss computer software “genres” and “narratives,” and develop the notion of “genre-responsive design” (aspects of the practice of designers and implementers that contribute or relate to a particular genre).

Issues presented in this book are of more than theoretical interest. Many of today’s managerial strategies have less to do with the specific direction of employees than with the construction – and sometimes intentional distortion – of virtual individuals and groups. Various traces that individuals and groups produce in their work routines (including keystrokes, voices, and photographs) are often incorporated into their virtual entities, more than occasionally without the knowledge or consent of the persons portrayed. Not all of the construction of virtual entities involves a passive, unaware subject, however. Individuals and groups are often directly instrumental in many aspects of constructing their own virtual individuals and groups, from the letters they pen and pictures they draw to the utilization of such system-supported features as “agents” or “surrogates.”

Social and managerial sciences have contributed to the popular and current notions of the individual and the group, as well as to construction and modification of boundaries and relations between and among individuals and groups. International and interdisciplinary discussions aimed toward clarification and development of the basic notions underlying collaborative or cooperative work, and the associated place of the individual in these enterprises, are proceeding at an exciting pace. Some “ideal type” or prototypical cooperative work groups (from the quality circle to the self-managed team) have become popular topics of discourse. The social and managerial sciences, and the practitioner communities associated with them, are lending insights to network-based system design efforts – and in turn are being influenced in their own directions by the systems.

Technology, the self, and the group

Attention to issues of groups and cooperative enterprise in knowledge work can be traced back several centuries. Francis Bacon used the genre of the novel as a vehicle to impart his vision of cooperative scientific activity. His New Atlantis (1879b), first published in 1627, provided a dream and a model for future cooperative scientific enterprise, and reflected a vision that does not deviate greatly from many current perspectives on “computer coordinated,” groupware-supported science.

In New Atlantis, Bacon describes Solomon’s House, on the island of
Bensalem, the objectives of which included obtaining “the knowledge of Causes and the secret motions of things, and the enlarging of the bounds of the Human Empire, to the effecting of all things possible” (p. 480). In the House of Solomon, science is pursued in a cooperative format – with an assembly-line-style division of intellectual labor, made possible by the way science itself is supposedly divided into theory and experiment (a notion Bacon explored in Novum Organum).

Bacon was well aware of the notion that groups can limit and manipulate the perspectives of their members, as well as support and extend their members’ visions: he warns of how the customs and opinions of others can serve to distort our perceptions. Merton (1973) reflects that Bacon’s work is part of a long tradition of scholars who have “emphasized the corrupting influence of group loyalties upon the human understanding” (p. 122). The problem of how team-style, coordinated scientific activity can progress without danger of undue “contamination” by the social world is one that Bacon’s intellectual successors are discussing fervently more than 350 years later in the context of CSCW systems.

Today, interest in issues of self and group comparable to those that Bacon tackled is blossoming in a variety of contexts – from managerial and educational circles to “self-help” and “New Age” associations. From the neighborhood bridge club to the surgical team that repairs a heart, we are concerned with the effectiveness and fairness of the relationships that individuals have with the groups they are associated with. Popular works such as Robert Bellah et al.’s (1985) Habits of the Heart and Christopher Lasch’s (1978) The Culture of Narcissism provide a group-oriented approach to issues of the role of human associations and community in personal as well as social spheres. Alternative approaches have emerged, with other emphases and concerns. Wheelis’s (1958) The Quest for Identity and other volumes influenced by it warn of dangers of conformity that strong identification with community life can engender.

Both the printing press and the computer are linked historically with substantial changes in the way individuals view themselves, and in the way “individuality” itself is constructed. Statements that the advent of the computer will have at least as large and as dramatic an impact on civilization as that of the printing press have become commonplace. Many of the social changes for which the printing press served as a catalyst are chronicled in Elizabeth Eisenstein’s (1979) The Printing Press as an Agent of Change and in her earlier work (1969). Michel Foucault (1977, 1982) also links literacy, writing, and printing with various stages of the concept of individuality and the development of the notion of self; he contends that many aspects of the self are indeed modern inventions, closely linked to changes in organizations and technologies.
Introduction

I relate the advent of computer-mediated interpersonal exchange to various permutations of what “selfhood” and “group membership” constitute. Rather than comparing the computer and the printing press, however, I emphasize linkages among genres: for example, I compare the advent of the scientific journal in the 1660s with that of CSCW applications in the 1980s and 1990s. Scientific journals helped to construct “science,” as well as the scientist and the scientific community. CSCW and other network-based system genres are today serving similar functions in constructing various social activities and personae in such spheres of life as science, education, entertainment, and business.

Mead’s (1934) account of the self does not have strong historical grounding. Unlike the previously described notions, Mead’s “self” was not linked with a specific technology such as the printing press. Nevertheless, Mead’s ideas have been influential in my work. Mead’s Mind, Self, and Society has played a pivotal role in both U.S. and European intellectual history, most strongly in development of social psychology and symbolic interactionism. Mead’s self is a social product, reflecting and intimately linked with its social surroundings through such constructs as the “generalized other” (an abstract entity that incorporates various social trends as well as moral or religious standards). Through its projection and interaction with a generalized other, the self receives a certain level of guidance as well as a set of social constraints. Projecting these idealized entities helps us make sense of an often-chaotic world.

Individuals deal not only with abstract expectations concerning their behavior, but also with a set of virtual selves – credit reports, photographic traces, educational records, and computer-generated profiles. These virtual entities can be a part of the individual’s sense-making efforts in the social realm, and thus serve some of the roles of generalized others. Individuals not only develop biographies and resumes, but have such accounts of their characteristics and interactions with others constructed by managers, bankers, teachers, and others in positions of authority. Many individuals either are now or will soon interact with teammates in groups in which group process and structure are shaped and mediated by network-based computer systems; the virtual groups constructed in these systems are also involved in some of the individuals’ own sense-making efforts.

We learn about ourselves, the groups we belong to, and the other human beings around us through interaction with virtual individuals and groups. How we respond to various manipulations of virtual individuals and groups provides clues as to how we construct certain situations. For example, we may respond quite directly and negatively when our names or other markers of identity are removed from a written work we have
produced. Manipulation and distortion of virtual individuals and groups have become easier to accomplish with certain kinds of technology (Oravec, in press). With digitized photography, our images can be removed from (or added to) snapshots of family gatherings, making it seem as if we were never present (or that we were indeed present when we weren’t). We still have a “mirror” of the group in question, but it is a distorted mirror – and as time passes it may serve to shape our own or others’ recollections of the family event.

Our virtual individuals and groups may be used in our job evaluations, for insurance purposes, and in the educational arena. Those who make many of the important decisions concerning our futures may never contact us directly; they may deal only with the virtual entities associated with us. Given the important societal roles of virtual individuals and groups, the proliferation of these entities is a matter of concern. If we lose control over the many, often distorted constructions of ourselves, we indeed lose control over our lives. We may not be able to understand the complex statistics used to construct a certain computer “profile” or analysis of our behavior (one that shows we have tendencies toward underachievement or antisocial behavior), yet we may face prejudice because of that profile. The growing array of virtual groups provides special challenges: we know little about how groups perform their functions, yet powerful tools for their management (groupware) can provide managers with profiles of our groups’ operations for purposes of administration and evaluation.

CSCW and other network-based system applications can also afford us heightened levels of control over the virtual individuals and groups we are associated with – including means to construct an assortment of computer-based alter egos and agents. In some VR environments, we are able to move digitized “hands” that can manipulate objects within the environments; some of these environments incorporate technology that simulates touch, allowing us to feel as if we were handling “real” objects (Smith, 1995). The term “avatar” is often associated with entities that are linked with us in VR contexts. Our computer-based agents are also performing such everyday functions as screening electronic mail and news for potentially interesting tidbits for our digestion.

Electronic surrogates may serve a complex assortment of roles in communications for the humans associated with them, as in the following system envisioned by researchers at NASA’s Ames Research Center:

The objective [of the Virtual Environment Workstation Project] is to provide a collaborative workspace in which remotely located participants can virtually interact with some of the nuances of face-to-face meetings while also having access to their personal dataspace facilities . . . With full body tracking capability,
Introduction

it will also be possible for each user to be represented in this space by his or her own life-size virtual representation in any chosen form – a kind of electronic persona. (Fisher, 1990, p. 29)

Simpler varieties of these systems (which associate various forms or shapes with team members rather than elaborate personae) are already available for use.

Expansion of means for personal and group expression through electronic surrogates provides exciting (and disturbing) prospects. In the arts and technology journal Leonardo, Lentini (1991) projects the “mutation of the individual” in the form of electronic “doubles”:

With the anticipated advent of computerized human figures, it will be possible to create doubles of real persons with or without any relation to reality. One will be able to speak with them or manage them and make them do what one wants. I have no doubt that such operations will become within reach of most everyone, from the state to the citizen, in real or deferred time. (Lentini, 1991, p. 335)

Not all forms of virtual representation involve life-sized reconstructions of an individual’s physical shape, but the possibility of such expansive forms of computer-mediated expression and interaction opens new ways of thinking about what it is to participate in social activities. If our images can “stand in” for us in certain contexts, then what is it to be fully “present” in an event? Our relationships with these doubles – as well as with other virtual entities linked with printing, computing, or video imaging – have broad social and personal impacts: how we feel about these entities, and whether we draw associations between them and ourselves, help determine the activities they are involved in and the values they reflect. As I discuss in Chapter 2, some of us may become “mirrorless” in some contexts, and lose the tools for self-knowledge and identity management that virtual entities can provide. In contrast, others of us may become “persona entrepreneurs,” and attempt to explore and exploit the expanding set of means for development and dissemination of virtual individuals and groups.

VR is adding an assortment of dimensions to these issues. Some kinds of VR applications are stimulating thinking about new varieties of group interaction; for example, new kinds of therapist–client dyads are emerging. Clients and therapists may soon share VR experiences as a mode of communication and mutual discovery in one-on-one sessions. Larijani (1993) explores how “heightened senses of control and safety” possible in VR applications can create a new twist on therapy: “Because a person is engaged in the action and helps determine the course of events, he or she can safely explore issues that hurt or frighten under ordinary circum-
stances” (p. 90). Extension of these applications to diagnosis and treatment at the level of the small group is likely, as is the development of comparable permutations of the group in workplace and educational settings.

Many mathematicians are proposing that models are better manipulated through interactive graphics – through picking and poking at objects – than through series of equations and diagrams (Brooks, 1988). In comparable ways, we may be able to deepen our understanding of social interactions and structures by manipulating socially significant objects and experimenting with correlates of social forces in VR-enhanced environments. The vehicles we have today for sharing insights about social realms – which include books such as the one you hold now – may soon be supplanted by means through which we can learn through a broad panoply of experiential modes.

I also explore the approaches to management that are emerging from these technological and social innovations. Computer-mediated bibliographic traces and profiles play an important, if not primary, role in some kinds of management and administration. Such basic cultural themes as privacy, dependence, and autonomy are being given a new slant as social and moral theorists attempt to decipher the social trends associated with CSCW applications. The notion of “self as social construct” is becoming incorporated in discourse on informational privacy, as privacy theorists and activists struggle to obtain adequate conceptual tools to aid in understanding the interactions of computers and society (Post, 1989; Oravec, 1993). Related matters involving freedom of human association and interaction in computer-mediated systems are being explored and discussed by civil libertarians as well as technologists.

What is groupware?

Labels that technologies and genres are given, and categories in which they are placed, play an important role in how they are perceived and implemented. For new and complex applications in a growing, changing field such as computing, such labeling takes on even more importance. Even though labels apparently play important roles in discourse, far-reaching policy decisions concerning information and communication technologies are often made on the basis of ill-considered names, rubrics, and categories. By carefully considering the names applied to technology, we can begin to unmask some of the political and social commitments and assumptions associated with the technology (see Rowland, 1984; Opt. 1987).

Precise origins of the buzzword “groupware” are unknown, but are widely attributed to Cal Pava of Harvard and Peter and Trudy Johnson-
Introduction

Lenz in the early 1980s. The following terms have been associated with groupware efforts in the past decade: “technological support for workgroup collaboration,” “workgroup computing,” “collaborative computing,” “interpersonal computing,” “coordination technology,” “computer-supported groups,” “group process support systems” (see Johansen, 1988, for more). Patricia Seybold’s group (which publishes Office Computing Report: A Guide to Workgroup Computing) has proposed the following nomenclature:

Groupware is only part of the story – a category of software. It doesn’t address the hardware, communications, and sociological issues that are a major part of the new trend toward collaborative work . . . to me, workgroup computing encompasses all of these elements as well as illuminating the concept of the people who make up the group . . . who sit at workstations on the network . . . who use the groupware. The term seems to capture best the human factor . . . which is ultimately the most important. (Marshak, 1990, p. 4)

In a lighter vein, Browning (1990) pinned the name “social lubricants” on CSCW applications in the Economist.

The word “groupware” has been used in a restricted sense – to identify multiuser application approaches, approaches that support such group activities as brainstorming, idea organization, and decision making. It has also been used in a broader manner to refer to any support tool for groups. Approaches in which the separately generated products of individual users are shared have occasionally been classified in terms of the “single-user application sharing approach,” rather than groupware per se (Ohkubo and Ishii, 1990, p. 145; see also Halonen, Horton, Kass, and Scott, 1990).

The fact that the term “groupware” has been openly utilized in academically oriented conferences has lent it some credibility, although how its usage will stabilize is still in question. The CSCW label was reportedly coined by Irene Greif in 1984 (Suchman, 1988a). Discussion of just what the acronym “CSCW” stands for was the topic of a panel session at a 1988 conference of CSCW researchers and developers. Grudin’s account of this session provides the following renditions of the acronym:

A brief history of the term was given by Irene Greif, who helped coin it in 1984 in order to concisely identify a group of researchers from different disciplines but with common interests. Mark Steflk suggested several possible expansions of “CSCW,” including “Can’t Stop Coining Words.” Robert Howard focused on the word “supported,” noting that in some environments, computers may instead compel collaboration. Several alternatives to “cooperative” were suggested by panelists, including “collaborative” and “coordinated,” but Rob Kling suggested
“coercive,” again touching on ethical issues that are salient to this field but were absent in the conference presentations. (Grudin, 1989b, p. 83)

Labels such as “groupware” can inspire interest, but also create confusion. Lee reports that although the emergence of the term “[groupware]” has created a stampede of manufacturers who describe their products as groupware, the products do not have a lot in common, except that they are all meant to be used by more than one person, not necessarily at the same time. (Lee 1989, p. 24)

He speculates that the resulting confusion about what groupware consists of may have contributed to the lukewarm acceptance that products with that label have had in some quarters. Suchman, the leader of one of Xerox’s current CSCW initiatives, states that she has problems with the theories and technologies currently placed under the label of “groupware”: “I have doubts about the extent to which we know what we are talking about – theoretically and empirically” (quoted in Williams, 1990, p. 95).

Categories of products that have been placed under the groupware umbrella include enhanced electronic mail and conferencing systems, schedule coordination aids, collaborative authoring tools and design support, project team coordination aids, group consensus-reaching and decision-making aids, and support for face-to-face meetings. Some of the applications just listed may be considered CSCW application “subgenres” (for lack of a better term) – forms of expression and communication that have identities of their own but that are still closely tied to CSCW-related notions and imagery. I explore several of these subgenres in depth (including collaborative writing tools and group decision-making aids).

Under the general header of “network-based systems” falls a substantial share of computing environments and related applications today. Early experiments in timesharing in the 1960s showed the value of connecting terminals to a powerful, central mainframe. Today, coupling of different types and sizes of computer components occurs with many variations. Network-based systems range from a small number of personal computers (PCs) and peripherals linked together in an office or school computer lab to complex and powerful “client/server networks” that incorporate an assortment of mainframes, workstations, printers, and storage technologies (discussed in Chapter 1). Large-scale networks (including the Internet, AT&T’s long-distance network, and IBM’s Global Network) are being coupled with CSCW applications such as Lotus Notes (Cortese, 1995; Electronic Messaging News, 1995). Not all computing is network-based, however; for example, computers are found in an increasing number of products, such as