Preface

The ideas that form the foundation of this book were developed during 25 years of working in libraries. In libraries, I worked on a daily basis with information systems and their users, and repeatedly wondered, "Why aren't these information systems more usable?" Now, as I wander through the campus of a major research university, I see students lining up to use automated teller machines (ATMs). They use ATMs easily, almost automatically, without thinking about it. Then I see the same students laboring over the online public access catalog (OPAC) in the University Library, every mark of agony and frustration indicating their lack of success in using the OPAC. To its credit, the library offers regular, hour-long instruction in how to use the library catalog, including both beginner and advanced sessions. But I wonder, "If a bank had to have its customers attend two hour-long evening sessions to enable them to use the ATM, wouldn't that be a terrible admission of failure in the design of their system?" And I am reminded of the objective articulated by the designers of Xerox copiers: "If we could make the experience of using a Xerox photocopier as simple and straightforward as the experience of walking through a door, then we will have made a truly usable copier" [Rheinfrank, J. J., Hartman, W. R., & Wasserman, A. (1992). Designing for usability: Crafting a strategy for the design of a new generation of Xerox copiers. In P. S. Adler & T. A. Winograd (Eds.), *Usability: Turning technologies into tools* (pp. 15–40). New York: Oxford Univ. Press].

The apparent difference in usability between ATMs and online catalogs may at first appear to derive from an inappropriate comparison. After all, OPACs are general-purpose search systems, while ATMs are special-purpose machines designed for limited tasks. Yet it is precisely the difference in the design of the two systems that produces the differences in their usability. Banks have thought out the tasks that their customers need to accomplish and have assigned some of those tasks to a system that has limited objectives but accomplishes those objectives in a reasonably straightforward way. Libraries, on the other hand, seem neither to have thought through the needs of their users and the tasks they are accomplishing nor to have developed appropriate systems to address those needs and tasks.

This first example compared a library information system with a commercial information system. In this book, there are a number of library examples, but for

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the most part the discussion is kept at a reasonably high level of generality. It is intended that this general discussion about the design of information systems, services, and institutions will cover principles and approaches that can be applied in a wide variety of design settings. The literature of system design suggests that information systems that support and manage business information, scientific data, and government files are as much in need of the user-centered approach as are library information systems.

The term "user-centered" in the sense used in this book can be traced back to 1974 [Walther, G. H., & O'Neil, H. F. J. (1974). The user–computer interface in an information utility delivery system: An empirical approach to user-centered design. In P. Zunde (Ed.), *Information utilities: Proceedings of the 37th ASIS annual meeting* (pp. 114–119). Washington, DC: ASIS], and perhaps further; the bibliographic tools do not really allow detailed searches of earlier materials. The term "user-centered" and the concepts driving its use are encountered today in an increasing number of domains. A recent scan of the literature showed this term being applied to specific design decisions, such as creating voice mail systems, vehicles for highway use, or computer-aided manufacturing systems. But the main focus of user-centered approaches seems to cluster around the design of information systems of various kinds. So, for example, we find the term being applied to databases, interfaces, and information architectures such as hypermedia. At the level of a specific information institution, user-centered redesign has been proposed for many functions of libraries, such as user-centered catalog design, indexing, and interlibrary loan.

This book brings together a great deal of the literature that is relevant to user-centered information systems and services in an integrated discussion that chronicles the revolutionary impact of user-centered approaches on the way information systems, information work, and information institutions are envisioned. But this book does not simply describe the changes that are occurring or that might occur in the future. The approach is frankly one of advocacy, and throughout the book there is a continuing argument that user-centered approaches are needed to achieve successful and usable information systems, services, and institutions. The terribly simplistic conviction that provides the conceptual foundation for this book is that much information-system design emphasizes the data contained in the system rather than the users of the system and what they want to do, and that is why there are so many bad information systems. Throughout the book I will try to convince the reader that user-centered design is possible and that, when applied to information systems, user-centered design will produce usable, effective information systems.

Ideas that lead to the creation of successful and usable information systems, services, and institutions form the core of library and information science. But the approach to library and information science taken here is not parochial. Rather, it is driven by an understanding that the ideas and concepts of library and information science can be found under different labels in many academic disciplines, ranging from the social sciences to engineering. One of the objectives of this book is

to bring together from many disciplines a wide range of literature relevant to user-centered design. Of course, completing this task in any comprehensive manner is impossible, and the continued evolution of the literature makes such an endeavor as difficult as jumping onto a moving train. Readers may find that the literature cited in this book is representative of a large corpus of research that is relevant and important to scholars and students in library and information science. This representative sample can form a starting point from which they can delve more deeply into this research, as they seek to understand users and to use this understanding to create usable information systems and services.

The contents of this book have been used as text materials in courses taught in three different schools of library and information science. The detailed discussion of users and their information needs, tasks, and resources is suitable for use in a course in information organization and access. The consideration of design principles and design alternatives can be used in courses on information-system design and information technology. The final chapters, on information services and institutions, could be applied to courses in user services and in management, respectively.

In addition to its academic audience, this book should be of interest to those who are responsible for designing information systems. Each chapter of the book discusses one step in the process of analyzing the users of information systems and designing elements of the information infrastructure to respond directly to those users' needs. It is anticipated that designers will adapt each of these general discussions to their specific domains and develop detailed approaches to the design of specific information systems, services, and institutions. At the same time, the general outline of information systems and information work presented here may be used by information professionals to understand the tools they are using and how they can influence the development of more usable information systems and services. To facilitate the use of this book by designers and professionals, a summary of the practical design implications developed in the detailed discussions is provided at the end of each of the even-numbered chapters.

This book was written in many interesting places, including Kilcrohane, County Cork (thanks to Betsy Hearne), and Pivot Lake, Ontario (thanks to my parents). But the bulk of the writing occurred during a semisabbatical from the University of Illinois during which I was invited to be a visiting scholar at the I. D. Weeks Library of the University of South Dakota. I particularly express my appreciation to the librarians and staff of that library, and I give a special thanks to Imre Meszaros and Heidi Nickisch for their hospitality in providing an environment in which I could write in peace.

Many colleagues will recognize ideas we have discussed over the years. To them, I can only express my gratitude for their willingness to debate and brainstorm. I am also indebted to four anonymous reviewers for their helpful comments. To my wife, Gillian, who helped me over many difficult spots with her constructive editing and suggestions, I owe more than gratitude.