# World Wide Research

## Reshaping the Sciences and Humanities

edited by William H. Dutton and Paul W. Jeffreys

with a foreword by Ian Goldin

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# Preface

## Uncloaking a Revolution in Research

A revolution is under way in the technologies being developed to support research across all disciplines. It is often cloaked in technical terminology—an alphabet soup of acronyms and obscure articles in specialized conference proceedings. However, its results might fundamentally transform the ways researchers go about their work, just as innovations such as the mobile phone, the Internet, the World Wide Web, and email have altered how we carry out our everyday lives. The consequences of the rise in increasingly powerful and versatile computer-based and networked systems for research—what this book calls "e-research"—will generate waves well beyond the laboratory or the ivory tower because they are more generally changing how we know what we know.

Our edited volume offers authoritative and accessible insights to the nature of this new set of technologies, how these technologies are being applied, and with what consequences in a variety of fields. It explains why major public and private investments are being made in e-research and how they promise to shape the quality of research that underpins policy and practice that are affecting how we work and socialize, as well as how we make once-in-a-lifetime decisions on climate change, medical treatments, urban design, and other strategic issues. The success or failure of e-research is not predetermined, but it is likely to be an assorted mix of some spectacular failures, many incremental improvements, and some as yet undreamed of major successes, much like the creation of the Internet and Web from earlier phases.

Most fields of research have already experienced change in the technologies they use and on which they increasingly depend. For example, the Internet has offered new pathways for researchers to get information and communicate with colleagues. Future advances may introduce an additional step change in the collaborative and computational potential of researchers around the world. This change may be only a chimera or what others see as the dawn of a glittering age of discovery. Will it be for the better or the worse? Who will benefit and who will be disadvantaged? Readers of this book can find informed answers here.

## Who Should Read This Book?

The research community, their funders, and the providers of the technologies they use must understand the technological changes taking place in research. This subject is too important to be left to the technical experts and a few tech-savvy researchers in the sciences and humanities. That is why we have edited this book to offer contributions from well-informed authors that can be read by anyone with a serious interest in the future of research and its role in policy and practice.

The authors explain complex technical and substantive areas clearly but without oversimplification, which makes the book of value not only to the growing community of e-researchers, but also to researchers in different domains who are charting their career and planning their training, as well as to managers and professionals involved in research at all levels who need to know the potential risks and opportunities opened up by these innovations. All those with a concern for the quality of research that informs students, business and industry, governments, and civil society should gain much from our contributors. Skeptics and critics as well as enthusiasts and the hopeful regarding e-research will find a balanced approach that treats their views fairly in order to improve understanding of the nature and implications of the expanding and fast-moving set of innovations examined.

Research on the social implications of the Internet and of related information and communication technologies (ICTs) has investigated many sectors, from home uses of the Internet to national and global policymaking. However, it is only beginning to focus on the implications for research itself, perhaps because the subject is too close to home. Social scientists with an interest in science and technology should therefore find this book to be a rich source of material for debate over the social aspects of technical design and implementation as well as their implications for work in an information age.

The technical innovations surrounding ICTs are among the most spectacular transformations of this era, and yet questions still abound over the quality of information that forms the basis of our decisions in banking, finance, international affairs, the sciences, and the humanities. Of course, technology is only one part of a larger complex of factors shaping decisions made by people about how to use technologies to change how they access information and with whom they do and do not collaborate. It is a product of an ecology of choices about information, people, services, and technologies that are constrained by many social and technical factors.

That is what this book is about. It is the outcome of work by a physicist who has led e-science initiatives at the European Organization for Nuclear Research (CERN) and in universities, and by a social scientist who focuses on the social shaping and implications of ICTs. It draws contributions from scholars across a wide range of fields as well as from leaders in the policy world and in business and industry. It is an example of the interdisciplinary collaboration required to conduct and understand the potential of innovations in worldwide research.