J.-E. Dubois • N. Gershon (Eds.)

The Information Revolution: Impact on Science and Technology

With 50 Figures and 17 Tables
CONTENTS

AUTHORS XII

PREFACE XIX

J.-E. Dubois and N. Gershon

PART ONE: EMERGENCE OF AN INFORMATION SOCIETY: FACTS AND CHALLENGES

CHAPTER 1: INFORMATION HIGHWAYS: INTERNET AND WEB SERVICES

DEALING WITH THE DATA DELUGE. VISUALIZATION AND DATA MANAGEMENT

N. Gershon, W. Ruh, B. Dickens, J. Levasseur and J. Winstead 3

CONTENT-BASED INFORMATION RETRIEVAL: NEW TOOLS FOR TEXTUAL DATA, NEW PROBLEMS FOR IMAGE DATA

F. Murtagh 13

THE WORLD-WIDE WEB: A GLOBAL SOURCE OF DATA AND INFORMATION

J. Winstead and N. Gershon 21
STRUCTURING AND VISUALIZING HYPERSPACE WITH HYPER-G
F. Kappe 29

INTERNET-WEB AND ST DATA MANAGEMENT: HARMONIZATION AND NEW HORIZONS
J.-E. Dubois and B. Messabih 43

ONLINE ELECTRONIC PUBLISHING: DEVELOPING INFRASTRUCTURE FOR THE ELECTRONIC READER
B.E. Kirsop, A. Edwards and S. Sousa 57

A WORKBENCH FOR BIBLIOGRAPHIC OR FACTUAL DATA HANDLING
J. Ducloy, J.-C. Lamirel and E. Nauer 63

CHAPTER 2: OBSTACLES TO A FREE OR FAIR CIRCULATION OF SCIENTIFIC DATA

FACETS OF THE KALEIDOSCOPE OF SCIENTIFIC INFORMATION
A. Heck 71

ICSU POLICY ON ACCESS TO DATA AND INFORMATION
M.A. Chinnery 83

ISSUES IN THE TRANSBORDER FLOW OF SCIENTIFIC DATA
S. Alexander and P.F. Uhlir 87

LEGAL AND ECONOMIC ASPECTS OF DATA PRODUCTION AND TRANSFER
G. Papapavlou 93

GUIDELINES OF A EUROPEAN METEOROLOGICAL SERVICES POLICY ON DATA EXCHANGE
B. Orfila 101

CHAPTER 3: DISTRIBUTED DATA AND INFORMATION NETWORKS

INTEGRATED GROUND-BASED AND REMOTELY SENSED DATA TO SUPPORT GLOBAL STUDIES OF ENVIRONMENTAL CHANGE
R.J. Olson, R.S. Turner and C.T. Garten 107

CRITICAL FACTORS FOR THE USE OF PUBLIC DATABASES
A. Jansen and P. Sorgaard 113
PART TWO: WORLDWIDE AND REGIONAL INFORMATION SYSTEMS, POLICIES AND PROGRAMS

CHAPTER 4: UNESCO POLICY, WORLDWIDE NETWORKS, REGIONAL EXCHANGE EQUITY

UNESCO POLICY ON SCIENTIFIC DATA EXCHANGE; GRAVE DISPARITIES IN DATA ACCESS, POSSIBILITIES
A. Badran

NETWORKING AFRICA'S SCIENTIFIC AND TECHNICAL INFORMATION RESOURCES
S.F. Rossouw

NEW TECHNOLOGIES (MULTIMEDIA - HYPERTEXT - HYPERMEDIA) POTENTIAL USE IN DEVELOPING COUNTRIES
L. Abdat and B. Messabih

BARRIERS TO INTERNATIONAL TECHNOLOGY TRANSFER
A. Gaye

THE DEVELOPMENTS OF A SCIENTIFIC RESEARCH DATA NETWORK SYSTEM IN CHINA
Z. Xu
CHAPTER 5 : NUMERICAL, TEXTUAL AND IMAGE DATABASES

INTEGRATED INFORMATION MANAGEMENT FOR PHYSICS
E. Hilf, B. Diekmann, H. Stamerjohanns and J. Curdes

NUMERICAL DATABASES - CAN WE AFFORD THEM?
E. Fluck and H. V. Kehiaian

TEACHING BIOLOGY BY VIDEO IMAGES ASSISTED BY COMPUTER: EMBRYOLOGICAL LABORATORIES
V. Ndiaye

THE STATE OF CHINESE MATERIALS DATABASES
Z. Xu

CHAPTER 6 : CASE STUDY : WORLDWIDE BIOINFORMATICS DISTRIBUTED DATABASES

BIOINFORMATICS - PULLING THE EUROPEAN STRINGS TOGETHER
M.L.H. Lalieu

BIOINFORMATICS IN EAST ASIA
A. Tsugita

BIOINFORMATICS IN THE UNITED STATES: RECENT TRENDS FROM A MICROBIOLOGICAL PERSPECTIVE
L.D. Blaine

MmtDB: THE METAZOA MITOCHONDRIAL DNA VARIANTS SPECIALIZED DATABASE
M. Attimonelli, D. Calo, A. Depascali, M. Porzio, F. Tanzariello, M. Vitale and C. Saccone

EPITOPE DATABANK,
L. Ling, G. Shimura, H. Sugawara and A. Tsugita

PROTEIN SUPERFAMILY DATABASE (PROSUP)
K. Horimoto, K. Oshima, A. Tsugita and J. Otsuka

CONCERTED USE OF MULTIPLE DATABASES FOR TAXONOMIC INSIGHTS
A. Kolaskar and P.S. Naik