Book Reviews

XML: A Manager's Guide. Kevin Dick. Reading, MA: Addison-Wesley; 2000; 185 pps. $29.95 (ISBN: 0-201-43335-4.)

Extensible Markup Language (XML) is being touted as the "next big thing" to hit the Internet. This rather simple technology is poised to significantly impact the way business and business communication is currently being conducted. It is being advanced that an XML-powered Web will be a faster, friendlier, and a far more superior medium for future business communications. The projected impact of this new technology appears to be more than initially anticipated, even by those directly involved with this technology. "In some sense, the World Wide Web Consortium (W3C) greatly exceeded expectations. Not only did it develop a technology for solving the Web document information exchange problem, it developed a technology with the potential to solve information exchange problems in every area of distributed computing" (p. 18). Succinctly stated, this 2-1/2-year-old recommended W3C standard is taking the Internet world by storm—and doing so in Internet time. Such expectations are fueled, in large part, by the hope that XML will usher in a new era of communication by providing a true interoperability standard for information exchange over networks, while remedying some of the biggest problems and constraints inherent with our existing Internet-based information exchange technology.

In light of XML's explosive rise, many managers and developers find themselves confused and unprepared to address their corporation's needs. Few managers and developers understand what this technology is all about, and many remain perplexed and in dire need of concise, basic information regarding this technology. Yet, there is often no simple means, even with mature technologies, to efficiently glean the knowledge required by managers and developers to competently lead their organization in a timely enough manner. Thus, managers find themselves left perplexed and scrambling.

Kevin Dick's book entitled, *XML: A Manager's Guide*, seeks to address this XML education need head on. Dick's clearly stated goal for this book is to serve as (1) a concise guide for managers, and (2) a starting point for developers seeking to take advantage of XML. Briefly stated, this book strives to provide an introductory overview to the essentials relating to a number of the most significant XML areas, as well as to provide a roadmap and layout that enables managers and developers to acquire XML fundamentals in an optimal manner. Dick advances that many managers remain confused and unprepared to address their corporation's needs, and that managers and developers need to understand what this technology is all about. They also need to know (1) how XML will impact them, (2) what the capabilities and proper applications for this technology are, as well as (3) how to capitalize on XML. In addition, that there are fundamental and practical XML implementation concerns and issues that managers and developers need insight into. As Dick states, "It is important for individuals and organizations faced with information exchange problems to understand how XML can help them, the tools they need to deliver

solutions, and how they can overcome the inevitable barriers to deployment" (p. 18).

This book contains three distinct and purposeful sections. In the first, the author explains the need for XML, introduces XML fundamentals, and describes how standards are facilitating XML's goals of information exchange. In the second section, Dick analyzes tools, processes, and staff required for proper XML deployment. In the third section, the author advances five sample XML applications for the enterprise, followed by five product development sample applications pertinent to software vendors. Throughout the book, Dick balances the needs of managers and developers by advancing comprehensive, yet relatively simple, charts, models, and examples that teach basic concepts, while illustrating the power of XML.

Chapter 1 focuses on communicating the need for XML. This chapter recounts the explosive growth of the Internet and its transforming impacts. In the process, this chapter identifies that the current traditional Internet technology has some inherent information exchange shortcomings and that such shortcomings extend to all aspects of the Internet. It is advanced that a number of these challenges are related to the Web's current language HTML. Dick points out that, while HTML was extremely successful in meeting its initial goals (of linkage, simplicity, and portability), HTML's primarily focused on page layout and presentation was approached in a manner that limited the exchange of information. As a result, a second generation Internet language, one with a set of shared content standards or metadata (data about data) was required. Thus, XML— an extensible markup language—was developed and recommended. A significant benefit of XML would be the ability to separate the content of a document from its presentation. As stated by Dick, " . . .it made sense to create a standard for markup. The result of the standards process was a rich document markup language that allowed authors to separate the logical content of a document from its presentation" (p. 15). However, this language would go on to deliver much more than expected. It would become a language and a technology that would not only help solve the Web document information exchange problem, but one that had a potential to significantly impact information exchange problems in every area of distributed computing.

Chapter 2 introduces the reader to the fundamentals of XML. It provides an overview of XML from a high-level, manager's viewpoint. This chapter begins by introducing the concept that XML specifications contain two parts: XML documents, and XML document type definitions (DTDs). It stresses the flexibility, power, and sophistication inherent in the XML language. This chapter seeks to equip managers with a basic understanding of the syntax, the ability to effectively communicate with developers, and to help the reader better analyze the return on investment from XML related projects. In addition, the hierarchical organization structure of XML is presented, along with rules for developing well-formed documents.

Chapter 3 provides an overview to the five most significant emerging XML standards. Each of these standards seeks to add features to or to address drawbacks inherent with XML documents and DTDs. The ultimate goal of each standard is to allow for even greater levels of versatility and flexibility to be derived from XML. The five XML enhancement standards include: XML Namespaces;

XML Linking Language; Extensible Stylesheet Language; XSL Transformations; and XML Schema.

Chapter 4 addresses XML tools. This chapter is of value in procuring services and in selecting vendors. Its content seeks to identify which tools may be appropriate, as well as to clear up general confusion within the entire tools area. This chapter also tracks the robust state of fundamental components that support XML, the maturing of Web infrastructure and development tools, along with the emergence of authoring and content management tools.

Chapter 5 mainly targets Project Managers, focusing on the software development process, as well as on the people and skills required. This chapter emphasizes impacts resulting from migration to XML, and how XML development differs from traditional software and Web development. Dick identifies that different levels of impacts will be encountered based on the type of application being developed. In particular, development processes and staffing requirements differ based on the types of XML document being implemented (e.g., content, business, or protocol). Within this chapter, the author warns, "success requires a particularly wide range of skills" (p. 106), and then further admonishes that, due to the additional levels of coordination required, "coordinating staffs from different backgrounds presents a challenge" (p.108).

In the last two chapters, i.e., Chapter 6 and 7, the author advances that, "the best way to understand the potential for XML is to consider some examples" (p. 119). As a result, these chapters address the development of 10 sample XML applications. In developing these 10 sample applications, the author's goal is not just to transfer knowledge but, more importantly, to inspire the reader to consider development of such applications to the benefit of one's organization.

Chapter 6 identifies and develops five important *enterprise* applications that the author feels can provide operating benefits through increased efficiency or by providing new processes. The five enterprise-related XML applications identified are Information Distribution, Knowledge Management, Workflow, Application Integration, and Data Integration.

Chapter 7 identifies and develops five important *vendor* product and services-related applications that the author feels can provide selling benefits via reducing costs or enabling new product features. The five vendor-related XML applications advanced include: Personalized Web Sites, Information Aggregation, Software Bill of Materials, Configuration and Logging Files, and Distributed Protocols.

Both chapters provide an Executive Summary section that includes a concise summary table of the five respective applications identifying the associated benefits envisioned with each application. In addition, the write-up pertaining to each of these 10 applications follows the same methodical seven-section format of: Business Challenge, XML Benefits, Architecture, Key Features, Development Process, DTD Source, and Document Life Cycle.

Dick concludes the book with a Glossary of terms. This glossary covers many of the XML related terms introduced within the text, as well as defines general Internet terms that may be unfamiliar to the reader.

This book has many strengths, one being that the preface of the book does an exceptional job of laying out the purpose of the book and identifying the target audiences for each section of the book. (The target audience is based on the reader's position and prospective involvement in XML-related projects.) The entire book is presented in a straightforward manner that makes it extremely easy to follow. Moreover, this format allows one to easily skip back and forth, from section to section, without becoming lost or confused. In addition, there are benefits derived from the methodical layout for each chapter by: (1) establishing itself off of the previous chapter; (2) containing an opening Executive Summary for that chapter; and (3) providing one-sentence paragraph summaries (in the margin) for every paragraph of the book. As a result, this book allows for the reader to concentrate on those areas that best meet their particular needs enabling the reader to maximize the knowledge gained for the amount of time invested.

A second strength of the book is that Dick purposefully (and quite successfully) shields the XML novice from the technical verbiage that surrounds this language. Although Dick is sufficiently adept to convey his message using technological terms, he prefers to present his XML essential at a level corresponding to his audience's needs. Yet Dick does provide, for those managers and developers inclined to read at such a level, a glimpse into the more intricate details of this technology.

Most important, a third strength of this book is that it provides the requisite vision and inspiration necessary for managers and developers to (1) appreciate the implications and potential of this swiftly advancing technology, and (2) to launch out on their first XML-related project. Dick achieves this by clearing away the confusion surrounding XML, while simultaneously providing a general enough overview to XML to enable the reader to envision where this language fits within their respective organization, as well as where this technology may be deemed most practical.

As for any shortcoming with this book, the depth of information (particularly within the middle few chapters of the book) may be found to be a bit deeper than required by most managers. However, the book's hierarchical layout, chapter Executive Summaries, and one-sentence paragraph summaries allow for managers to identify and optimize the level of information they may wish to gleam from such chapters.

Overall, this introductory guide to XML meets the needs of a very broad audience of managers, and particularly technical managers, in that it serves as a rather comprehensive, yet concise, introduction to XML concepts. For busy managers, the book's layout allows for a quick-read while providing a sufficient grasp of the essentials. This book also meets the need of being a very basic overview book for developers. However, for those developers already familiar with XML, this book may prove to be too basic a read. In like manner, for those readers seeking to become XML programmers, this book will start you off with a solid footing; but, you will need to seek out additional, more detailed texts.

In conclusion, this book serves as an extremely proficient means for introducing XML essential to managers and developers who need to quickly introduce themselves to this advancing technology and how XML may be impacting their business. The overview and the insights provided will help prepare its reader with the basics necessary for decisions confronting them. This book is certainly well worth reading or skim reading, as appropriate. Kevin Dick has clearly achieved his objective of educating managers and developers with the essential knowledge required to enable them to identify benefits, as well as proper applications for the deployment of this technology's capabilities. In short, Dick has successfully achieved his envisioned goal "of arming managers with the information they need" by developing an extremely succinct, yet sufficiently detailed, *Manager's Guide* to XML.

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High Technology and Low-Income Communities. Prospects for the Positive Use of Advanced Information Technology. Edited by Donald A. Schön, Bish Sanyal, and William J. Mitchell. Cambridge, MA, and London, UK: MIT Press; 1999: 411 pp. Price: $25.00. (ISBN 0-262-69199-X.)

In Spring 1996, the Massachusetts Institute of Technology's Department of Urban Studies and Planning offered a colloquium

entitled "Advanced Information Technology, Low-Income Communities, and the City." Participants included, in addition to the faculty and students, invited social scientists, planning practitioners, technologists, and Boston-area community activists who were alumni of the MIT Community Fellows Program.

This collection of essays, analyses, research reports, and experiential reports was presented during the course of the colloquium. Recommendations for policy makers and researchers conclude the volume. The editors present the work as a record of the colloquium, as a vehicle for communicating the accumulated views of the participants to a broader audience, and as a contribution to the body of the community.

Part I: Setting the Context, establishes the demographic and technologic landscape of the course. Essays by Leo Marx ("Information Technology in Historical Perspective"), William J. Mitchell ("The City of Bits Hypothesis"), Manuel Castells ("The Informational City Is a Dual City: Can It Be Reversed?"), Peter Hall ("Changing Geographies: Technology and Income"), and Julian Wolpert ("Center Cities as Havens and Traps for Low-Income Communities") present a picture of large East Coast megacities being transformed by information technologies. In this section, the inner-city urban poor (almost by definition minorities) are further disenfranchised by lack of access to the information technologies and the infrastructural access to the jobs IT creates in the exurbs and suburbs (the digital divide).

Part II: Strategies of Action, addresses five facets of the IT–society interaction. William J. Mitchell addresses "Equitable Access to the Online World." Essays by Joseph Ferreira, Jr. ("Information Technologies that Change Relationships between Low-Income Communities and the Public, and Nonprofit Agencies that Serve Them") and Michael J. Shiffer ("Planning Support Systems for Low-Income Communities") comprise the Governance and Advanced Information Technology facet. Addressing Entrepreneurial Potential, Alice H. Amsden and Jon Collins Clark ask "Software Entrepreneurship among the Urban Poor: Could Bill Gates Have Succeeded if He Were Black? . . . Or Impoverished?" Representing the K12 environment in The Educational Computer, Jeanne Bamberger offers "Action Knowledge and Symbolic Knowledge: The Computer as Mediator." In The Community Computer, activists report on projects scattered throughout real low-income neighborhoods. Community networks and their implications to members of the community are addressed by Sherry Turkle ("Commodity and Community in Personal Computing"), Alan and Michelle Shaw ("Social Empowerment through Community Networks"), Anne Beamish ("Approaches to Community Computing: Bringing Technology to Low-Income Groups"), and Bruno Tardieu ("Computer as Community Memory: How People in Very Poor Neighborhoods Made a Computer Their Own"). Mitchel Resnick, Natalie Rusk, and Stina Cooke report on "The Computer Clubhouse: Technological Fluency in the Inner City," a project focused specifically on local youth.

In Part III: Conclusions, Bish Sanyal and Donald A. Schön present "Information Technology and Urban Poverty: The Role of Public Policy," including their recommendations based on the research and presentations of the colloquium.

The geographic foci of this 1996 colloquium were the high population density urban cores of a few northeastern cities, notably the Boston–Washington, DC, corridor. Smaller urban communities, and nonurban communities are not included. Likewise, urban areas of the South, Midwest, and West are not included. While understandable in the context of the academic locus and schedule, neither the title nor the table of contents or introductory material makes the narrow focus of the work clear. This coyness may increase sales, but is a disappointment to the reader whose focus is a rural, tribal, or small town low-income community.

Most references cited by contributing authors were published between the mid-1980s and early 1990s. Given the comparatively recent growth of home computer ownership, Internet and World Wide Web access and use, and proliferation of school and library installations nationwide, these essays are already somewhat dated in spite of their recent vintage.

A wider sampling of projects, both geographically and demographically, would present a more challenging and complex picture.

Part I contains a wealth of statistical demographic information, useful for defining the population characteristics of interest to the colloquium participants. The nonacademic reader may find them dry enough to be dissuasive. This material could have been located in appendices to good effect. Likewise, an integrated bibliography would have been useful, although each essay contains its own bibliographic references.

Part II contains the majority of the essays in this volume. The subsections are unequal in weight and depth. Given the number of organizations in and outside the local, state, and federal governments confronting access issues, The Question of Access subsection is too meagerly populated by its single, although solid, essay.

Similarly, the K12 (or K16, or K20) communities have fielded enough research, conferences, and ongoing collaborations to suggest that the sole essay in The Educational Computer section is insufficient to represent the state of technology in educational settings.

The Entrepreneurial Potential subsection's sole article is more than a mere orphan in this collection; it is a fish out of water. There is much to argue on the topic of entrepreneurship in low-income communities, including technological infrastructure, access to venture capital and other financing, and much more. However, this essay cannot carry the burden of that debate alone. It does a good job of emphasizing human and community capital (such as educational resources) necessary to support entrepreneurial software endeavors, but does not consider the realities of the nomadic software industry worldwide. (In software, the issues are not merely race and community issues, they also include age and gender issues, and cutthroat economic competition. In perhaps the most globalized industry today, even highly trained, experienced, degreed, skilled, middle-class White males get laid off as programming is subcontracted to India and Singapore.)

In The Community Computer, the collection veers out of the academic and research center world and into real neighborhoods. These essays, most by community activists or partners, include much discussion of getting technology to the low-income disadvantaged communities almost whether the communities want IT or not. At several points, various authors note that users of information have their own needs and agendas that are not those of the activists or researchers reporting on the projects. However, the conclusions these writers reach do not seem to recognize the differences in users' needs and agendas as crucial, critical realities. Another reality that goes unacknowledged is the equipment versus human capital problem of IT prostyletizing. For teachers, librarians, and parents to be technology advocates and trainers, they must have training and encouragement as well as hardware and software. Further, even if the technology is available and the teachers adept, if the lesson plans are not built to foster problem solving, creativity, and so forth, those skills are not going to be learned even if presented on a monitor.

Part III's conclusions are firmly rooted in the academic community and its methods. Reliance on model-driven research in assessing the true state of the world can be dangerous and misleading. Unfortunately, making policy based on a narrow sample of a much larger population is the accepted norm. Remedial proposals thus generated often fail because, at the end of the day, the proponents and their solutions do not come from the communities and their inhabitants. Leaving aside a debate over trustworthiness of the frequentist statistical approach, cookie cutter approaches have not been widely successful across the broad spectrum of projects we as a society keep aiming at lower socioeconomic classes and communities.

With home computer ownership approaching 50% of U.S. households, governments committed to on-line publishing, and Web addresses replacing billboard text, the limited focus and dated essays make this volume more history than roadmap. "Digital divide" has assumed a central position in discussions of technology and its impacts on contemporary society and culture. It would be interesting to hear what the featured (largely ethnic minority) communities did after the prototype projects ended and the researchers left. It would be more valuable to see the similarities and differences among a larger collection of community-based projects from a wider range of low-income communities—rural, tribal, and suburban—including a broader range of grassroots and local mobilization efforts.

Finally, there is a danger of seeing the reports of academic efforts as authoritative or representative of more than merely one set of perspectives. We risk losing sight of the view from other windows—or indeed of ever knowing other windows exist. In my opinion, the failure of this collection is in missing broader grassroots realities: (a) the borders of low-income communities less bricks and mortar than negotiated spaces, and as such, are permeable and fluid; (b) poor people—minority or not—are neither helpless nor clueless about their options, including their access to technology. Communities do not need outsiders to tell them what their needs are; (c) people do get the technologies and goods they want, as is evidenced by the proliferation of televisions, pagers, and telephones; (d) "all models are wrong. Some models are useful." Theory, statistics, and decisions built on them are all suspect, particularly when gathered in the near-absence of wide participation from the communities in question.

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The rapid growth of the Internet and digitally based information technologies has given rise to numerous catch phrases. Among the hip new phrases is *knowledge management.* This book attempts to provide a broad but thorough overview of all facets of knowledge management. Part I, "Overview", provides two chapters of introductory information and states the purpose of the book—to "explore knowledge management from the perspective of the information professional whose job it is to make knowledge management an operational reality, not just a platitude" (p. 3). The subsequent chapters are presented as useful to the three groups that currently dominate the emerging field of knowledge management—vendors of software, hardware, and technologies; information service providers; and information specialists who provide advice to business relative to knowledge management.

Part II, "Background & Issues", addresses the development and evolution of knowledge management. The subsequent six chapters serve well as a basic primer on knowledge management. The very basic concepts of knowledge management are presented in chapters three and four. A very useful table in chapter four provides an outline of the information-processing paradigm of knowledge management. The question of the validity and staying power of knowledge management is presented in chapter five. The following two chapters examine the importance of the information environment and its effect on knowledge management, as well as key challenges facing knowledge management and managers. Chapter eight, "Ethics for Knowledge Management," is perhaps the most interesting chapter in the entire book. The author states that, "I wish to show that ethics is first a matter of vision or discernment, not decision" (p. 116). He proceeds to examine normative ethical theory, ethics as discernment, personal visioning, and metaphors of knowledge management. The author's concluding statement rings true: "knowledge managers will most ably advance the state of their ethics by remembering to include the knowledge of those whom they service" (p. 130).

Part III, "Knowledge Management—Creating the Culture of Learning and Knowledge Sharing in the Organization", is touted as the most important section of the book. Its first two chapters explore connections between knowledge and management and examine the importance of developing a learning organization. They are followed by a case study of knowledge management in a distributed computing environment and an examination of tacit knowledge as found in the writings of philosophers Gilbert Ryle and Michael Polanyi. Finally, the last chapter in this section relates to the use of knowledge management at the National Institutes of Health. Interestingly, this chapter also uses the example of a living cell as a corollary for knowledge management.

Part IV, "Knowledge Management—The Tools", is actually the most useful section of the book because it provides real-time examples of how to implement knowledge management. For instance, its first chapter examines the communications technology that supports knowledge management, and the second chapter provides insight into the use of Internet search engines as one element in knowledge management. The third chapter shows how information technology that supports the generation, organization, communication, access, and application of knowledge is central to knowledge management. In the subsequent chapters, very technical information about vocabulary control, infomapping, information coding, and information repackaging are presented.

Part V, "Knowledge Management—Application", provides strategies and examples of knowledge management in action. Its seven chapters appear to provide the essence of knowledge management. Thomas Short of IBM Global Services talks about important concepts such as knowledge levers, harvesting, harnessing, and hypothesizing. Several chapters examine the evolution of knowledge management in specific settings. The experience of changing from a traditional library to a virtual research organization is described by Ellen Ryske and Theresa Sebastian of Andersen Consulting. For those whose purview includes the health sciences, chapter 23, "Knowledge Management in the Health Sciences," reviews the development of knowledge management in the health science environment. Lastly, Nina Platt of Faegre & Benson LLP describes knowledge management in a law office setting. Several chapters in Part V also relate to knowledge management in countries outside the U.S. Margaraeta Nelke of Tetra Pak Research & Development AB reviews the use of knowledge management in Swedish corporations, and book editor Dr. Srikantaiah examines the burgeoning use of knowledge management in developing countries.

The last part of the book, VI, "Appendices", consists of a knowledge management course syllabus (Dominican University, Graduate School of Library & Information Science), a comprehensive bibliography on knowledge management, a thematic model for information-driven management, and biographical notes about the book's contributors. The syllabus is provided courtesy of Dr. T. Kanti Srikantaiah of the Dominican University, Graduate School of Library & Information Science (more than one syllabus would have been beneficial for comparison sake). The bibliography includes 611 citations on knowledge management that include citations from books, journal articles, chapters in conference proceedings, web sites, and videos. This author critically reviewed the bibliography and compared its citations with several searches on

knowledge management conducted on information related literature databases—it appears that an appropriate scope and breadth of literature has been included in the bibliography. The thematic model is actually an extension of chapter 3, "The Evolution of Knowledge Management," and reviews 21 themes of information management. Among the themes reviewed are supply chain management, data warehousing, competitive intelligence, and data-driven systems design.

The book provides a broad overview of the concepts and current state of knowledge management. The most useful elements of the book are the case studies that examine actual implementation of knowledge management rather than talking in theoretic. Of ancillary value is the thought-provoking chapter on ethics for knowledge managers. Although the book notes that there are three classes of knowledge management users, this book is probably most useful to those providing information services within and as consultants; it appears to hold little value for vendors. *Knowledge Management* should appeal to a broad range of information professionals, including librarians, information specialists, the burgeoning knowledge management profession, and information systems integrators. The direction knowledge management is headed is unclear, but this book provides early documentation of its values and approach.

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The Information Resources Policy Handbook: Research for the Information Age. Benjamin M. Compaine and William H. Read, eds. Cambridge, MA: The MIT Press; 1999: 631 pp. Price: $55.00. (ISBN: 0-262-03264-3.)

In *Research for the Information Age*, the editors have successfully compiled a set of essays suitable for any mass communication or technology class. It contains 22 chapters, grouped into five sections. Each chapter has extensive notes, as might be expected from such distinguished contributors. Short biographies of each contributing author are included at the end of the book. The five separately entitled sections include "Ageless Issues," "New Age Technology," "Information as a Resource," "The Information Business," and "Information Policy." The chapters therein are microeconomic in topic and perspective. The beginning of each section leads off with an "Evergreen" chapter described by Compaine and Read at xviii:

> Whether newly written or authored years ago, these chapters contain perspective and principles that are not nor are likely to get outdated. Some of the remaining chapters are also contemporary; others have an enduring quality. But, over time, we expect that the Evergreen chapters will stay consistent from edition to edition, while the 'contemporary' chapters will be changed as topics become resolved and new ones become current.

This reviewer preferred the latter over the "Evergreen" chapters, as they were less philosophical and academic in tone. Overall, this editorial collection contributes nothing new to the areas of law and communication policy, broadband, or the Internet; rather, it documents much of the evolution of communications mediums over the past 20 years within a regulatory environment that varies from medium to medium. This reviewer would have savored a sixth section on technology and the stock market or "Why Technology?" amidst all the technological history and juxtaposing contained in the first five sections. Alas, nary a mention of our volatile, technology-driven stock market throughout its 616 pages. Research for the Information Age takes technology for granted. There is no in-depth discussion of why we need to spend all our free time on a cell phone responding to our beepers, which came in response to e-mails our secretaries thought important enough in the first place to beep us! Chapter 9, entitled "Communications—For Better or for Worse" tries but does little more than recite the available mediums.

Chapter 1, entitled "Telling Ripe from Hype In Multimedia: The Ecstasy and the Agony," laments the promise of multimedia for lack of bandwidth; an often-told story that is not soon to be resolved. In chapter 2, entitled "Will Computer Communication End Geography?", the author compares e-mail to electricity, the telephone, and air travel, among others. Chapter 2 is an *ode* to global economics and a new world order. Chapter 3, entitled "A Convergence of Form and Function: Compunications Technologies", defines compunications at page 77:

> Once upon a time, people perceived computing and communications processes as distinct and independent from one another. After World War II, this view gradually shaded into a perception of computing and communications as bundled inextricably into computing-and-communications processes, compunications processes for short.

Chapter 4, entitled "Understanding Computers and Communications" is an interesting chapter explaining the significance of much of the popular terminology floating out from our TV screens, including the World Wide Web (WWW), Internet, analog versus digital communications, and an interesting discussion of Moore's Law at pages 87–88:

> Gordon Moore, a founder of Intel Corporation, observed in 1965 that the trend in the fabrication of solid state devices was for the dimensions of transistors to shrink by a factor of two every 18 months. Put simply, electronics doubles its powers for a given cost every year and a half. . .But according to Moore's Law, electronics that is twice as effective in a year and a half will be 16 times as effective in 6 years and over 1000 times as effective in 15 years. This implies periodic overthrows of everything we know.

Chapter 5, entitled "Understanding Digital", is a lengthy discourse on comparing digital and analog technology. A similarly lengthy chapter 6, entitled "Standards: The Rough Road to the Common Byte", reviews several desktop and communications standards too numerous to mention here. Chapters 7 and 8, entitled "Building Blocks and Bursting Bundles" and "Publishing as a Creature of Technology" cover the history of publishing and the gradual growth of electronic databases to the growth of mass media in general. Chapter 9 was covered earlier.

Chapters 10 through 14 are devoted to various charts and graphs documenting the growth of the information industry. Chapter 10, entitled "Charting Change: The Harvard Information Business Map," seems ill placed in this section entitled "The Information Business." More a business model or strategy in the vein of game theory, the Harvard Information Business Map is putting the carriage before the horse in this section. The focus is on a particular process for *information* gathering rather than *information* dissemination. Chapter 15, entitled "Information and Communications Policy Research—More Important, More Neglected" is a short chapter lamenting the lack of information and communications research (mainly from a lack of interdisciplinary research). In the following chapter, chapter 16, author Ithiel de Sola Pool examines the state of communications regulation today, or, rather, yesterday. Almost 20 years old, this contribution could have used an update in light of all the AT&T mergers and their quest to

delimit ISPs from cable lines in Portland, Oregon. Chapter 17, entitled "Regulating Communications in the 21st Century: New Common Ground," and chapter 18, entitled "FCC Reform: Does Governing Require a New Standard?", mostly cover antitrust law and bash the Federal Communications Commission (FCC). Considering the FCC's hands-off policy on broadband and its allocation, this reviewer had difficulty comprehending the author's concerns. The last four chapters explore the state of the Internet and each author uses his or her crystal ball to predict the future. Internet futurism is indeed a cottage industry.

The inside cover states, "This collection looks at the factors underlying digital technologies as well as the resulting public and strategic policy issues." Overall, this book accomplishes that. It serves as a good introduction to information formats and perhaps the history of the information industry, even if somewhat disjointed.

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