

Internet Television

Edited by

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Columbia Institute for Tele-Information



THE EUROPEAN INSTITUTE FOR THE MEDIA



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Internet Television

European Institute for the Media Series



THE EUROPEAN INSTITUTE FOR THE MEDIA

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Acknowledgments

This book is the result of a transatlantic collaboration between the Columbia Institute for Tele-Information (CITI) and the European Institute for the Media (EIM). Also participating was the Center for Global Communications at the International University of Japan (GLOCOM). The aim was to look at the advent of widely available individual broadband internet communications and its impact on a new stage in the development of television: Internet television. This global approach produced a broad range of focused, in-depth discussions covering many important issues. The commissioned research papers, collected and edited for this book, provide many insights and much information on Internet television.

This book benefited greatly from the research and administrative help provided by many people. Among them are the following: Reuben Abraham, Keisha E. Burgess, Jason H. Chen, Gabriele Eigen, Raymond Fong, Danilo “Jun” Lopez, Yuko Miyazaki, Rosa M. Morales, Jasmina Pejcinovic, and Stefanie Winde. We thank Robert C. Atkinson, Kenneth R. Carter, Bertram Konert, Koichiro Hayashi, Nobuo Ikeda, and A. Michael Noll for their managerial and substantive contributions to this project. Special thanks go to the authors and to Linda Bathgate, the book’s editor at Lawrence Erlbaum Associates.

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—*Eli Noam, Jo Groebel, and Darcy Gerbarg*
New York, February 2003

Contributor Biographies

John Carey

Managing Director, Greystone Communications, Affiliated Research Fellow at the Columbia Institute for Tele-Information, and Adjunct Professor, Columbia University Business School

John Carey is Managing Director of Greystone Communications, a media research and planning firm. He conducts research studies of new communication services directed toward homes, businesses, and schools. Currently, he is conducting research about broadband web service, e-commerce, interactive television, personal video recorders, and digital satellite radio service for cars.

His clients have included American Express, AT&T, A&E Television Networks, Bell Atlantic, Cablevision, Corporation for Public Broadcasting, Digitas, Into Networks, Loral Space Systems, NBC, the New York Times Digital Media Company, Public Broadcasting Service, Rogers, Cablesystems, and XM Satellite Radio, among others.

Dr. Carey is also an Adjunct Professor at Columbia University Business School, where he teaches graduate courses on Demand for New Media. He is an Affiliated Research Fellow at the Columbia Institute for Tele-Information. He holds a PhD from the Annenberg School for Communications at the University of Pennsylvania and is the author of more than 50 publications on interactive media and the adoption of new telecommunication technologies.

Kenneth R. Carter

Deputy Director, Columbia Institute for Tele-Information, Columbia University Business School

Kenneth Carter is the Deputy Director of CITI and a candidate for an Executive MBA at Columbia University. He joined the institute in June 1998 as Associate Director. Previously, Mr. Carter worked for the Federal Trade Commission (FTC) on such issues as the FTC's jurisdiction over resellers of prepaid telecommunication services for deceptive advertising of tariff rates. Mr. Carter has a background in media and communications, having worked for MTV Networks, Island Records, and the international television syndication firm D.L. Taffner. As Deputy Director, he manages CITI's research agenda, assists the development of the institute's online research platform, the Virtual Institute of Information, and serves as the institute's counsel. Mr. Carter's current research includes the Emerging Market Economy in Bandwidth, Over the Internet, and the regulatory and intellectual property issues in telecommunications. He received his JD from the Benjamin N. Cardozo School of Law, where he was a member of *The Cardozo Arts & Entertainment Law Journal* and President of the Asian and Pacific Law Students Association. Mr. Carter was awarded an Alexander Judicial Fellowship, serving as a full-time junior clerk in the chambers of Hon. John C. Lifland, U.S.D.J. He was graduated from Colgate University with an A.B. in Economics and East Asian Studies after studying abroad in England and Japan, and is proficient in Japanese. He is presently admitted to the bar in New York State and the District of Columbia.

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Gali Einav has a BA in political science and an MA in communications and journalism from Hebrew University, Jerusalem. She has worked both as a senior producer and journalist for the second television channel in Israel. Ms. Einav taught media studies at the New School of Communications in Tel Aviv. She is currently a PhD candidate in the communications program and a researcher at the Interactive Design Lab at Columbia University's School of Journalism. Her research interests include content models for interactive media.

Michael A. Einhorn

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Michael A. Einhorn is a consultant and testifying expert active in the areas of intellectual property, antitrust, media, and entertainment. Dr. Einhorn is also an Adjunct Professor in the Graduate School of Business at Fordham University, where he teaches a course in the entertainment industry.

Professor Einhorn has considerable professional experience in media and entertainment, having written articles, prepared affidavits, or testified in matters related to music licensing, antitrust, Internet television, peer-to-peer file sharing, digital rights management, anticircumvention, and misuse of copyright. He received a BA from Dartmouth College and a PhD in economics from Yale University. He also served as a professor of economics at Rutgers University and worked as an economist in the Anti-trust Division of the U.S. Department of Justice and at Broadcast Music Inc.

Darcy Gerbarg

Executive Director, Marconi International Fellowship Foundation and Senior Fellow, Columbia Institute for Tele-Information, Columbia University Business School

Darcy Gerbarg is a Senior Fellow at the Columbia Institute for Tele-Information, Columbia University Business School, since 1997. In 2000, she was Director of Business Development at Everest Broadband Networks. Prior to that time, she held research positions at Courant Institute for Mathematical Sciences, New York University, and the Computer Graphics Lab, New York Institute of Technology. She has been an adjunct faculty member at the Interactive Telecommunications Graduate Program and the Film and Television Departments at New York University. She was an adjunct faculty member at the State University of New York at Stony Brook, where she also built networked multimedia labs. Ms. Gerbarg started and directed the Graduate Program in Computer Art and the Computer Institute for Arts at the School of Visual Arts in New York. She also initiated and chaired the first SIGGRAPH Computer Art Shows.

Ms. Gerbarg has lectured, organized, and conducted panels, workshops, and presentations at professional conferences for industries, companies, and universities. She has a continuing interest in entrepreneurial activities, start-ups, and venture capital. Conferences she has organized for CITI include the Future of Digital TV (1997) and Venture Capital in New Media (1999). Ms. Gerbarg's edited publications include *The Economics, Technology and Content of Digital TV* (Kluwer Academic Publishers, 1999) and *Digital TV (Prometheus, the Journal of Issues in Technological Change, Innovation, Information Economics, Communications and Science Policy, Carfax Publishing Ltd., June 1998)*. Ms. Gerbarg has a BA from the University of Pennsylvania and an MBA from New York University.

Jo Groebel

Professor and Director, European Institute for the Media, EIM

Jo Groebel is Director-General of the European Institute for the Media in Düsseldorf and Paris, and holds a professorship for media at the University of Amsterdam. He is a visiting professor at the University of California

in Los Angeles (UCLA) and the University St. Gallen. He was President of the Dutch Association for Communication Sciences, and advisor to the Dutch and German governments at the highest levels, the UN, and several broadcasters and media firms. He is author/editor of 20 books. He has worked on numerous TV and radio productions internationally and contributed to many publications.

Jeffrey Hart

Professor of Political Science, Indiana University

Jeffrey Hart is Professor of Political Science at Indiana University, Bloomington, where he has taught international politics and international political economy since 1981. His first teaching position was at Princeton University from 1973 to 1980. He was a professional staff member of the President's Commission for a National Agenda for the Eighties from 1980 to 1981.

Professor Hart worked at the Office of Technology Assessment of the U.S. Congress in 1985–1986 as an internal contractor and helped to write their report *International Competition in Services* (1987). He was visiting scholar at the Berkeley Roundtable on the International Economy, 1987–1989. His publications include *The New International Economic Order* (1983), *Interdependence in the Post Multilateral Era* (1985), *Rival Capitalists* (1992), and (with Joan Spero) *The Politics of International*.

Michael L. Katz

Professor of Business Administration and Economics, Director of the Center for Telecommunications and Digital Convergence, University of California at Berkeley

Michael L. Katz is the Edward J. and Mollie Arnold Professor of Business Administration at the University of California at Berkeley. He also holds an appointment as Professor in the Department of Economics. Professor Katz is the faculty leader of the Haas Business School's e-business initiatives, and serves as Director of the Center for Telecommunications and Digital Convergence. He is a four-time finalist for the Earl F. Cheit award for outstanding teaching and has won it twice.

Dr. Katz has published numerous articles on the economics of networks industries, intellectual property licensing, telecommunications policy, and cooperative research and development. He is coeditor of the *California Management Review* and serves on the editorial board of the *Journal of Economics and Management Strategy*. Dr. Katz also serves on the Computer Science and Telecommunications Board of the National Academy of Sciences.

Dr. Katz served as Chief Economist of the Federal Communications Commission from January 1994 through January 1996. He participated in the formulation and analysis of policies toward all industries under com-

mission jurisdiction, including broadcasting, cable, telephone, and wireless communications.

Dr. Katz holds an AB *summa cum laude* from Harvard University and a DPhil from Oxford University. Both degrees are in economics.

Bertram Konert

Head, Digital World Program the European Institute for the Media, Lecturer, University of Düsseldorf

Bertram Konert is head of the "Digital World Program" at the European Institute for the Media and lectured in media science at the University of Düsseldorf. After training as a banker, he studied social science at the University of Osnabrück (1982–1987). He started his career as a researcher of telecommunications policy and electronic banking and received his doctorate in the area of economic and social science from the University of Osnabrück in 1993. Afterward, he worked for several years as a project manager for a computer company, where he was responsible for customer relations in the area of ISDN-networks and data communications.

Since June 1996, his main research interests at the European Institute for the Media include the socioeconomic developments of media transformation and convergence, particularly in the areas of digital broadcasting and new Internet services. In 2001, Dr. Konert became an editorial advisor on the editorial board of the research journal *Convergence*, published by the University of Luton Press.

Christopher T. Marsden

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Christopher T. Marsden has wide-ranging experience in academia, the Internet, telecommunications business, and public policy. He was previously Research Fellow (1999–2000) at the Harvard Information Infrastructure Project, Lecturer at Warwick Law School (1997–2000), and LL.M. Supervisor at the London School of Economics (1994–1997). He directed the ESRC European Media Regulation Seminar Group in 1998–1999. He has edited the following books: *Convergence in European Digital TV Regulation* (London: Blackstone, 1999, with Stefaan Verhulst) and *Regulating the Global Information Society* (Routledge, 2000). His current research is in legal, business, and technical challenges to video over Internet protocol, and especially standard setting, which is examined in "Cyberlaw and International Political Economy: Towards Regulation of the Global Information Society" 2001 L.REV. M.S.U.-D.C.L. 1. He contributes to journals including *info*, *Communications Week International*, and *Inside Digital TV*. In 1998, Mr. Marsden founded the International Journal of Communications Law and Policy (www.ijclp.org), which he coedits. He is also a consultant with London-based digital communications boutique consultancy Re: Think!

(www.re-think.com), and has been expert consultant to the Chief Executive of the Independent Television Commission (2000), the Council of Europe MM-S-PL Committee on digital media pluralism (1999), and Shell International's Global Scenario Planning team (2000). He was UK Regulatory Director of MCI Worldcom from 2001–2002 when he resigned.

Eli M. Noam

Professor of Economics and Finance, and Director of the Columbia Institute for Tele-Information, Columbia University Business School

Eli Noam is the Professor of Economics and Finance at the Columbia University Business School since 1976. After having served for 3 years as Commissioner of the New York State Public Service Commission, he returned to Columbia in 1990. He served as Director of the Columbia Institute for Tele-Information, an independent university-based research center focusing on strategy, management, and policy issues in telecommunications, computing, and electronic mass media; and Chairman of MBA concentration in the Management of Entertainment, Communications, and Media at the Business School. He has also taught at Columbia Law School and Princeton University's Economics Department and Woodrow Wilson School. Professor Noam has published over 20 books and 400 articles in economic journals, law reviews, and interdisciplinary journals and has served on the editorial boards of other Columbia University Press academic journals. He was a member of the advisory boards for the federal government's FTS-2000 telecommunications network, the IRS's computer system reorganization, and the National Computer Systems Laboratory. He received an AB (Phi Beta Kappa), MA, PhD (Economics) and JD from Harvard University.

A. Michael Noll

Professor of Communications at the University of Southern California, Annenberg School for Communication, Director of Technology Research at the Columbia Institute for Tele-Information, Columbia University Business School

A. Michael Noll is a Professor of Communications at the Annenberg School for Communication at the University of Southern California. He currently serves as Director of Technology Research at CITI. Professor Noll has had a varied career, including basic research at Bell Labs, science policy on the staff of the White House Science Advisor, and marketing at AT&T. He is an early pioneer in computer art, stereoscopic computer animation, and force-feedback (a forerunner of today's virtual reality). He has published over 75 papers on his research and is the author of seven books on telecommunication science and technology. His current research is focused broadly on the multidisciplinary technological, economic, consumer, business, and policy aspects of telecommunication. Professor Noll is a

seasoned author of op-ed pieces and a frequent columnist in trade magazines. He received his PhD in Electrical Engineering from the Polytechnic Institute of Brooklyn in 1971, MEE from New York University in 1963, and BSEE from Newark College of Engineering in 1961. He is a Senior Member of the Institute of Electrical and Electronics Engineers (IEEE) and is a member of the Audio Engineering Society, the Society for Information Display, and the Society of Motion Picture and Television Engineers.

Andrew Odlyzko

*Professor of Mathematics, Director Digital Technology Center,
Assistant Vice President for Research, University of Minnesota*

Andrew Odlyzko has recently assumed the positions of Professor of Mathematics, Director Digital Technology Center, and Assistant Vice President for Research at the University of Minnesota. Until this year, he was the head of the Mathematics and Cryptography Research Department at AT&T Labs. He has done extensive research in technical areas such as computational complexity, cryptography, number theory, combinatorics, coding theory, analysis, and probability theory. In recent years, he has also been working on electronic publishing, electronic commerce, and economics of data networks. Professor Odlyzko is the author of such widely cited papers as "Tragic Loss or Good Riddance? The Impending Demise of Traditional Scholarly Journals," "The Decline of Unfettered Research," and "The Bumpy Road of Electronic Commerce."

Robert Pepper

Chief, Office of Plans and Policy, Federal Communications Commission

Robert Pepper has been Chief of the Office of Plans and Policy (OPP) at the Federal Communications Commission (FCC) since December 1989. Under Pepper's leadership, OPP is responsible for policy questions that cut across traditional industry and institutional boundaries, especially those arising from the development of new technologies. At OPP, Dr. Pepper's responsibilities have included leading teams implementing provisions of the Telecommunications Act of 1996; assessing the development of the Internet; designing and implementing the first spectrum auctions in the United States; developing more market-based spectrum policies; assessing competition in the video marketplace; and assessing the impact of the development of the Internet on traditional communications policy structures.

Before joining the FCC, Dr. Pepper was Director of the Annenberg Washington Program in Communications Policy Studies. He also has been Director of Domestic Policies and Acting Associate Administrator at the National Telecommunications and Information Administration and developed a program on communications, computers, and information at the National Science Foundation.

He is a graduate of the University of Wisconsin-Madison, where he also received his doctorate.

Fritz F. Pleitgen

Director-General, WDR

Fritz Pleitgen is the Director-General of WDR, Westdeutscher Rundfunk, the largest broadcasting corporation in the German Association of Public Broadcasting Corporations, ARD. He took up this post in 1995. In January 2001, he became chairman of the ARD.

Initially a newspaper journalist, Mr. Pleitgen joined the WDR in 1963 as a reporter for ARD's main news program. In 1970, he was appointed ARD-correspondent in Moscow. He became Head of the ARD Studio in East Berlin in 1977. In 1982, he and his family moved to the United States, where he took over the ARD Studio in Washington. Mr. Pleitgen held this post for 5 years and then became head of the ARD Studio in New York. He returned to the WDR headquarters in Cologne in 1988 to become Editor-in-Chief of WDR television and head of the politics and current affairs section. During this period, Mr. Pleitgen won great acclaim for his reports on German reunification and the collapse of the Soviet Union. He was appointed Radio Director in 1994. In addition, Mr. Pleitgen regularly appears in television programs on WDR and ARD, both as presenter and reporter.

David Waterman

Professor, Department of Telecommunications, Indiana University

David Waterman is Associate Professor in the Department of Telecommunications at Indiana University, Bloomington, since 1993. He was previously a faculty member of the Annenberg School for Communication at the University of Southern California. At USC, Professor Waterman taught in the Annenberg School's Communications Management Masters program and in the Department of Economics. Prior to joining USC, Professor Waterman was the principal of Waterman & Associates, a Los Angeles consulting firm providing economic, policy, and market research services to communications industry and federal government clients. He has also served as Research Economist at the National Endowment for the Arts in Washington.

Professor Waterman has written widely on the economics of the cable television, motion picture, and other information industries. He is coauthor of *Vertical Integration in Cable Television* (MIT Press, 1997) with Andrew A. Weiss. His articles on market structure and public policy toward the media, the economics of motion picture production and distribution, international trade in motion pictures and video products, and other topics have appeared in *Information Economics and Policy*, *Journal of Communication*, *Journal of Econometrics*, *Telecommunications Policy*, *Federal Communications Law Journal*, and other academic journals and edited

books. The Corporation for Public Broadcasting and the National Endowment for the Arts have supported his research. Professor Waterman has presented his research in testimony before the U.S. Congress, and has served on expert panels or in an advisory capacity for the Federal Communications Commission, the Federal Trade Commission, the U.S. Department of Justice, and the General Accounting Office of the United States.

Professor Waterman received a PhD in Economics in 1979 from Stanford University. He completed his BA in Economics at USC.

Stephen Whittle

Controller, BBC, Director of the Broadcasting Standards Commission

Stephen Whittle returned to the BBC as Controller, Editorial Policy, in July 2001. Since 1996, he had held the post of Director of the Broadcasting Standards Commission. Before moving to the BBC, between 1993 and 1996, he was the Chief Adviser, Editorial Policy, of the BBC, and was responsible, among other things, for writing the first edition of the BBC Producer Guidelines. Between 1989 and 1993, he was Head of Religious Programs for the BBC. In 1977, from the World Council of Churches, where he was the Deputy Director of Communications, Mr. Whittle joined the BBC in Manchester.

Introduction

Darcy Gerbarg and Eli Noam
Columbia Institute for Tele-Information

Internet television is the quintessential digital convergence medium, putting together television, telecommunications, the Internet, computer applications, games, and more. It is part of a historic move from individualized narrowband capacity, measured by kilobits per user, to one of broadband with a capacity of megabits per user. This move will have major consequences for many aspects of society and the economy, similar to the impact the automobile had when it replaced trains, horses, and bicycles. It will affect, in particular, the medium now called television.

What exactly is Internet television (TV)? There is no agreement on a definition. It comes with different names—web TV, IPTV, enhanced TV, personal TV, and interactive TV, for example—which signify slightly different things. At the lower end of complexity, it is merely a narrowband two-way Internet-style individualized (“asynchronous”) channel that accompanies regular one-way “synchronous” broadband broadcast TV or cable. This Internet channel can provide information in conjunction with broadcast programs, such as details on news and sports, or enable transactions (including e-commerce) in response to TV advertisements. This is known as “enhanced TV.” At the other end of complexity is a fully asynchronous two-way TV, with each user receiving and transmitting individualized TV programs, including direct interaction in the program plot line. In between is one-way broadband with a narrowband return channel that can be used to select video programs on demand (VOD). What Internet TV is today and can be in the future forms the context of this book.