

## Foreword

Multimedia technology and networking are changing at a remarkable rate. Despite the telecoms crash of 2001, innovation in networking applications, technologies, and services has continued unabated. The exponential growth of the Internet, the explosion of mobile communications, the rapid emergence of electronic commerce, the restructuring of businesses, and the contribution of digital industries to growth and employment, are just a few of the current features of the emerging digital economy.

This encyclopaedia captures a vast array of the components and dimensions of this dynamic sector of the world economy. Professor Margherita Pagani and her editorial board have done a remarkable job at compiling such a rich collection of perspectives on this fast moving domain. The encyclopaedia's scope and content will provide scholars, researchers, and professionals with much current information about concepts, issues, trends, and technologies in this rapid evolving industrial sector.

Multimedia technologies and networking are at the heart of the current debate about economic growth and performance in advanced economies. The pervasive nature of the technological change and its widespread diffusion has profoundly altered the ways in which businesses and consumers interact. As IT continues to enter workplaces, homes, and learning institutions, many aspects of work and leisure are changing radically. The rapid pace of technological change and the growing connectivity that IT makes possible have resulted in a wealth of new products, new markets, and new business models. However, these changes also bring new risks, new challenges, and new concerns.

In the multimedia and technology networks area, broadband-based communication and entertainment services are helping consumer and business users to do their business more effectively, serve customers faster, and organize their time more effectively. In fact, multimedia technologies and networks have a strong impact on all economic activity. Exponential growth in processing power, falling information costs and network effects have allowed productivity gains, enhanced innovation, and stimulated further technical change in all sectors from the most technology intensive to the most traditional. Broadband communications and entertainment services are helping consumer and business users conduct their business more effectively, serve customers faster, organize their time more effectively, and enrich options for their leisure time.

At MIT, I serve as co-director of the Communications Futures Program, which spans the Sloan School of Management, the Engineering School, and the Media Lab at the Massachusetts Institute of Technology. By examining technology dynamics, business dynamics, and policy dynamics in the communications industry, we seek to build capabilities for roadmapping the upcoming changes in the vast communications value chain as well as to develop next-generation technological and business innovations that can create more value in the industry.

Furthermore, we hope that gaining a deeper understanding of the dynamics in communications will help us not only to make useful contributions to that field, but also to understand better the general principles that drive industry and technology dynamics. Biologists study fruit flies because their fast rates of evolution permit rapid learning that can then be applied to understanding the genetics of slower clockspeed species like humans. We think of the communications industry as the industrial equivalent of a fruit fly; that is, a fast clockspeed industry whose dynamics may help us understand better the dynamic principles that drive many industries.

Convergence is among the core features of information society developments. This phenomenon needs to be analyzed from multiple dimensions: technological, economic, financial, regulatory, social, and political. The integrative approach adopted in this encyclopaedia to analyze multimedia and technology networking is particularly welcome and highly complementary to the approach embraced by our work at MIT.

I am pleased to be able to recommend this encyclopaedia to readers, whether they are looking for substantive material on knowledge strategy, or looking to understand critical issues related to multimedia technology and networking.

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*Professor Charles Fine teaches operations strategy and supply chain management at MIT's Sloan School of Management and directs the roadmapping activities in MIT's Communications Futures Program (<http://cftp.mit.edu/>). His research focuses on supply chain strategy and value chain roadmapping, with a particular focus on fast-clockspeed manufacturing industries. His work has supported design and improvement of supply chain relationships for companies in electronics, automotive, aerospace, communications, and consumer products. His current research examines outsourcing dynamics, with a focus on dynamic models for assessing the leverage among the various components in complex industrial value chains and principles for value chain design, based on strategic and logistical assessments.*

*Professor Fine consults and teaches widely, with clients including Accenture, Agile Software, Alcan, BellSouth, Boehringer Ingelheim, Bombardier, Caterpillar, Chrysler, Delphi Automotive, Deutsche Bank Alex Brown, Embraer, Fluor, GE, GM, Goodyear, HP, Honeywell, Intel, Kodak, Lucent, Mercury Computer, Merrill Lynch, Motorola, 3M, NCR, Nokia, Nortel, Oracle, Polaroid, PTC, Research-in-Motion, Rolls-Royce, Sematech, Teradyne, Toyota, TRW, Unilever, Volkswagen, Volvo, and Walsin Lihwa.*

*Professor Fine also serves on the board of directors of Greenfuel Technologies Corporation (<http://www.greenfuelonline.com/>), a biotechnology company that he co-founded, which focuses on renewable energy. As well, he serves as co-director of a new executive education program, Driving Strategic Innovation, which is a joint venture between the MIT Sloan School and IMD in Lausanne, Switzerland.*

*Professor Fine holds an AB in mathematics and management science from Duke University, an MS in operations research from Stanford University, and a PhD in business administration (decision sciences) from Stanford University. He is the author of Clockspeed: Winning Industry Control in the Age of Temporary Advantage (Perseus Books, 1998). His work, on quality management, flexible manufacturing, supply chain management, and operations strategy, has also appeared in Management Science, Operations Research, Journal of Manufacturing and Operations Management, Production and Operations Management, Annals of Operations Research, Games and Economic Behavior, Sloan Management Review, Supply Chain Management Review, Interfaces, and a variety of other publications.*