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SOCIETY & THE INTERNET

How Networks of Information and Communication are Changing Our Lives

Edited by MARK GRAHAM & WILLIAM H. DUTTON

with a foreword by Manuel Castells

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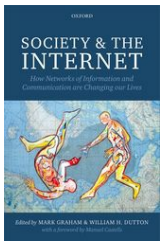

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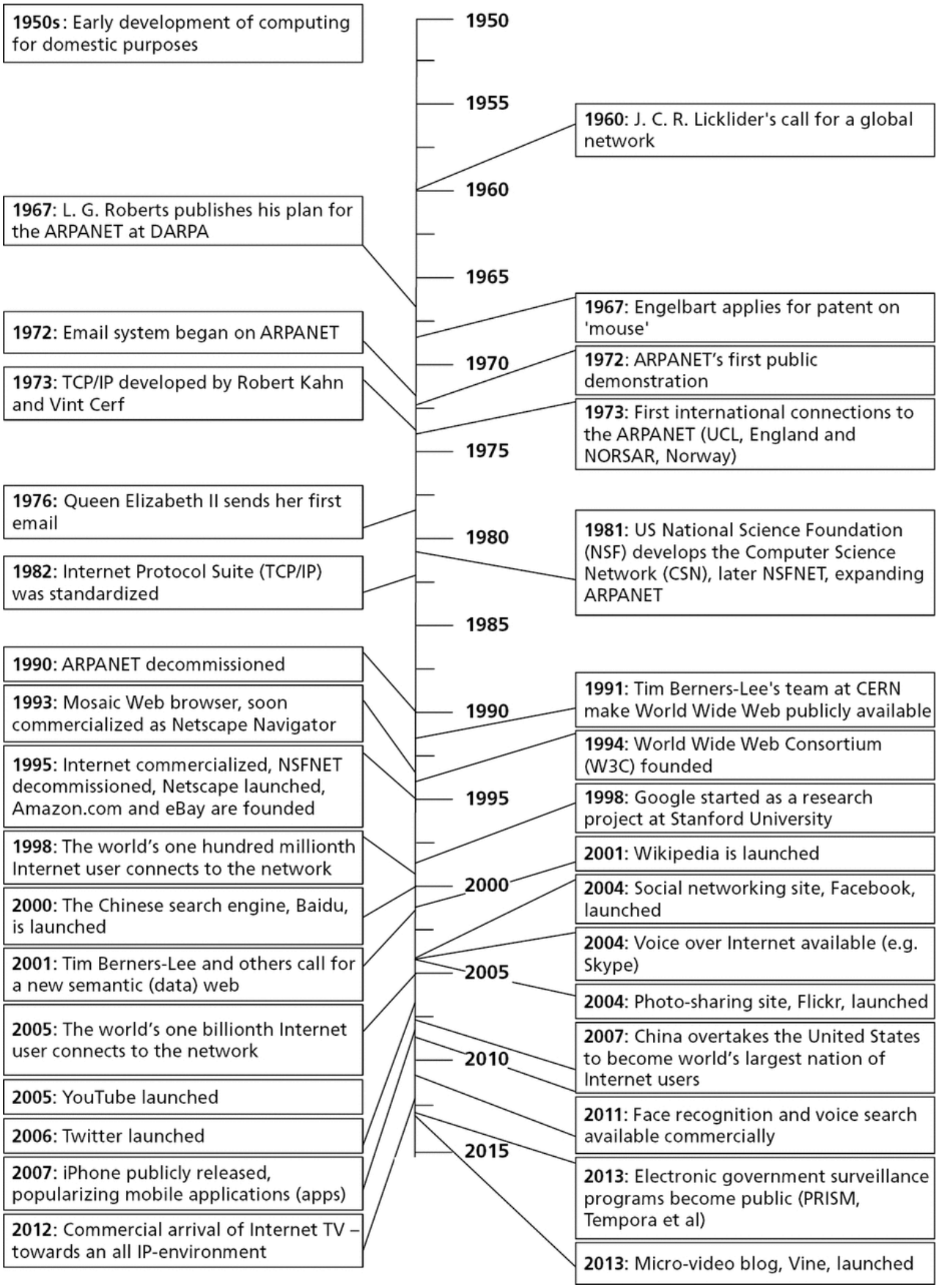
1950
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1950s: Early development of computing for domestic purposes
1960: J. C. R. Licklider's call for a global network
1967: L. G. Roberts publishes his plan for the ARPANET at DARPA
1967: Engelbart applies for patent on 'mouse'
1972: Email system began on ARPANET
1972: ARPANET's first public demonstration
1973: TCP/IP developed by Robert Kahn and Vint Cerf
1973: First international connections to the ARPANET (UCL, England and NORSAR, Norway)
1976: Queen Elizabeth II sends her first email
1981: US National Science Foundation (NSF) develops the Computer Science Network (CSN), later NSFNET, expanding ARPANET
1982: Internet Protocol Suite (TCP/IP) was standardized
1990: ARPANET decommissioned
1991: Tim Berners-Lee's team at CERN make World Wide Web publicly available
1993: Mosaic Web browser, soon commercialized as Netscape Navigator
1994: World Wide Web Consortium (W3C) founded
1995: Internet commercialized, NSFNET decommissioned, Netscape launched, Amazon.com and eBay are founded
1998: Google started as a research project at Stanford University
1998: The world's one hundred millionth Internet user connects to the network
2001: Wikipedia is launched
2000: The Chinese search engine, Baidu, is launched
2004: Social networking site, Facebook, launched
2001: Tim Berners-Lee and others call for a new semantic (data) web
2004: Voice over Internet available (e.g. Skype)
2005: The world's one billionth Internet user connects to the network
2004: Photo-sharing site, Flickr, launched
2007: China overtakes the United States to become world's largest nation of Internet users
2005: YouTube launched
2011: Face recognition and voice search available commercially
2006: Twitter launched
2013: Electronic government surveillance programs become public (PRISM, Tempora et al)
2007: iPhone publicly released, popularizing mobile applications (apps)
2013: Micro-video blog, Vine, launched
2012: Commercial arrival of Internet TV – towards an all IP-environment

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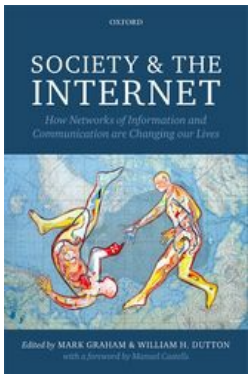

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Mark Graham and William H. Dutton

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(p.v) Foreword

Internet Studies
A Critical New Field in the Social Sciences

The Internet weaves the fabric of our lives. It is to the information age what the electrical engine was to the industrial age. We live in, on, and by the Internet, in work, business, education, health, governance, entertainment, culture, politics, social movements, war and peace, and friends and family. It is not really a new technology, as it was first deployed in 1969 as ARPANET, but its widespread diffusion in the planet at large took place in the 1990s after it was privatized and was made user friendly by the World Wide Web created by Tim Berners-Lee in 1990. The explosion of wireless platforms in the last decade has distributed the power of the Internet everywhere. With 2.5 billion Internet users worldwide (over half a billion of them in China), and over 6 billion subscribers of wireless devices, humanity is almost fully connected, albeit with uneven levels of bandwidth, in this network of computer networks that has become the backbone of all activities in all domains. It has made possible the constitution of a new social structure, the network society, that has subsumed the industrial society that characterized the world in the last two centuries. Social networking sites on the Internet, which have spread at an accelerated pace since 2002, have become the social spaces where people

meet, socialize, retrieve information, express themselves, work, shop, create, imagine, participate, fight, and shape their experience.

Yet, while everybody acknowledges the tectonic change the Internet represents in communication, the essence of human organization and practice, there is little understanding of the social implications of the Internet in the public mind, and even less so in the mainstream media that specializes in propagating horror stories about the effects of Internet use with little relationship to the actual experience of Internet users. This is a well-known fact in the history of technology: any revolutionary technology is met with fear by the population at large and with rejection by the holders of power and wealth, based on a superseded technological paradigm. The elites that are most opposed to new communication technologies are precisely the intellectuals, the *maîtres à penser*, who are disintermediated by the diffusion of information and the enhanced self-communication capacities of people. They are joined by the guardians of communication, that is the traditional mass media, who fear literally to be put out of business by free communication, and by the governments that have based their power throughout history on the control of information and **(p.vi)** communication. Thus, the more the Internet, the ultimate technology of freedom, referring to the visionary formulation of Ithiel de Sola Pool, permeates the human experience, the more it is misconstrued in the public perception. Cybersecurity becomes more important for all the powers that be than the creative construction of cyberculture, a new frontier of the human mind.

A veil of ignorance and ideology covers the reality of Internet as a social practice. And yet, social scientists know a great deal about the dynamics, effects, and potential impacts of Internet use. In the last two decades, there has been an extraordinary, cumulative harvest of empirical research and grounded theory on the interaction between social practices and Internet-based communication in every dimension of our experience. Studies have been conducted in multiple cultural contexts, at different points in time, on a wide array of topics, and with diverse methodologies, from formal models of network communication to statistical analysis of surveys on representative samples of the population of many countries, and fine-grain ethnographic and psychological observation. I would go as far as to say that we know more about the Internet as a social phenomenon than about most other communication technologies.

There is a dramatic gap between our scientific knowledge of the Internet and the public's perception of the communication technology that is at the root of their everyday life. The reasons for such a gap are not to be found in the lack of diffusion of the findings of social science. As I argued above, it is in the interest of the elites and of traditional media organizations to accuse the Internet of every possible evil, as if technology could be the cause of our social problems. Because the Internet is embedded in the culture of autonomy, and social autonomy contradicts the disciplinary powers of established institutions, there is a determined effort to undermine the credibility and legitimacy of Internet practices. And so, it is unlikely that producing rigorous knowledge about the Internet could lift the curtain of obscurantism that characterizes the perception of the most revolutionary communication technology in history.

Nonetheless, to conduct research on Internet practices, including the relentless transformation of the technology and its uses, to systematize it and to diffuse it, is a necessary step towards allowing humankind to appropriate the power of the Internet for the projects of individuals and social actors. Thus, the importance of the volume you have in your hands. It represents a methodologically rigorous and intellectually challenging effort to explain the interaction between Internet and society, between the technologies of freedom and the culture of autonomy. The studies contained in this reader, in their plurality, demonstrate the vitality of social sciences when they use the tools of empirical research and innovative theorizing to illuminate the current paths of social transformation.

Manuel Castells

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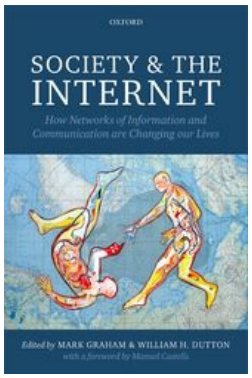

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(p.vii) Preface

How is society being shaped by the diffusion and increasing centrality of the Internet in everyday life? This book addresses this question through a stimulating set of readings grounded in theoretical perspectives and empirical research. It brings together research that examines some of the most significant cultural, economic, political, and other social roles of the Internet in the 21st century.

Together, this research defines some of the basic issues of Internet Studies, a new and thriving field of multi-disciplinary inquiry, which the Oxford Internet Institute (OII) has helped develop since its inception as a department of the University of Oxford in 2001. *Society and the Internet* draws primarily on the work of OII faculty participating in the Institute's evolving series of lectures targeted initially at students of the University of Oxford. The series was expanded, written, and edited for undergraduate and graduate courses.

Contributors and topics were selected to introduce students to some of the most engaging and groundbreaking scholarship in the field. The chapters are rooted in a variety of disciplines, but all directly tackle the powerful ways in which the Internet is linked to transformations in contemporary society. This book will be the starting point for

some students, but valuable to anyone with a serious interest in the economic, social, and political factors shaping the Internet and its impact on society.

As this book was nearing completion, we learned of the death of Douglas C. Engelbart (1925–2013), an engineer, and one of the first scholars to envision a future in which computers and telecommunications would be networked worldwide in ways that could augment human intelligence. In 1962, over fifty years ago, he started work on the design of what he called an "oN-Line System" (NLS), which he demonstrated in 1968, one year after his team invented the "mouse"—a device that has since changed the ways in which people interact with computers. He was one of many pioneers who helped shape what we have come to know as the Internet, Web, and related digital technologies, ranging from telecommunication infrastructures to tablets and smart phones. He was inspired by earlier pioneers, such as Vannevar Bush and J. C. R. Licklider, who called for a global system, and in turn inspired others, such as Ted Nelson, who coined the concept of "hypertext" to describe the non-linear pathways that can link text and images in the online world, and which move away from the model of a linear book.

Such early visions of what would become the Internet of the 21st century were formed when nearly all computing was conducted on large mainframe computers so expensive and complex that only governments and the larger **(p.viii)** organizations possessed such a resource. In the sixties, the very idea that households, much less individuals, would have access to a computer networked with millions of other computers around the world was viewed as folly—completely unrealistic futurology—or what many called "blue-sky" forecasts. Today it is taken for granted.

Of course, many pioneers followed in the steps of Engelbart and other early visionaries to develop the technologies we have access to in the 21st century. They include Vint Cerf and Robert Kahn, inventors of the protocols that define the Internet, and Tim Berners-Lee and his team at CERN, who invented the World Wide Web. Of course there are many more—too many to list, but one of the most unsung pioneers of the Internet is the user—people like yourself who use, view, mediate, edit, and therefore profoundly change the ways that much contemporary knowledge is circulated and re-circulated, and communication is enacted and used. This book provides many examples of how users have shaped the development of the Internet and its application across nearly every sector of society, always coming back to the key issue of what difference the Internet makes to all aspects of our lives.

Pioneers in the design and development of the Internet, such as Doug Engelbart, understood the importance of users. As computing moved from large mainframes to personal computers, to the Internet becoming your computer, it became clear that users were playing a major role in shaping the Internet in ways the designers might not have imagined. Consider the ways in which crowdsourcing—tapping the wisdom of Internet users distributed across the globe—has enabled users to play more important roles in science and society than many anticipated. Wikipedia, for instance, has been so successful that it has spawned a long-running joke: "The problem with Wikipedia is that it only works in practice. In theory, it's a total disaster." As new uses evolve, there is a need for even

greater ingenuity and creativity on the part of developers and users alike to address the problems and risks of the digital age, such as the potential of near-ubiquitous surveillance, and finding ways to authenticate information being created and distributed at Internet speeds.

In the half century since Engelbart envisioned an NLS, the promise of the Internet, Web, and related digital information and communication technologies to truly augment human intelligence has been realized, but so has the centrality of questions concerning the effect of a global Internet on such valued outcomes as freedom of expression, privacy, equality, and democratic accountability. In fact, most debates over such central values as freedom of expression in the 21st century are about the Internet.

Well before the 21st century, many people considered the potential societal implications of computing and telecommunications enabled by digital technologies. As early as 1973, computer scientists such as Kelly Gotlieb began to write about some of the key social issues of computing, such as the implications for freedom of expression, privacy, employment, education, and security. **(p.ix)** Most of these issues remain critical today in reflecting on the societal role of the Internet. In the early 1970s, Gotlieb and others discussed the idea of an "information utility" and were well aware of J. C. R. Licklider's call for a global network, even though ARPANET—the early incarnation of what would become the Internet—was only at the demonstration stage at the time they wrote, and governments were the primary adopters of computing and electronic data-processing systems. Nevertheless, the issues defined as early as the 1970s remain remarkably key to discussions of the Internet, big data, social media and mobile Internet debates over forty years later.

What is different in the second decade of the 21st century is that the Internet has become an infrastructure of everyday life and work for much of the world. It is no longer simply a vision, but has become increasingly real. The Internet has become so widely diffused and pervasive that we can begin to study seriously the actual societal implications of one of the most significant technologies of our lifetimes.

The central mission of this book is to show you how a multi-disciplinary range of academics seek to understand, both theoretically and empirically, the social roles of the Internet. It is in this spirit that this book brings to bear a variety of methodological approaches to the empirical study of the social shaping of the Internet and its implications for society.

Are those developing and using the Internet creating a system that augments human intelligence, as Engelbart had envisioned, or are we using the Internet in ways that undermine social relationships and the quality and diversity of information resources required for economic, social, and political development? What difference is the Internet making to the quality of our lives, and how can it further enhance our lives in the future? What people, places, groups, and institutions have been able to derive the most benefit from the Internet, and who has been left out? Who gets to control, create, and challenge new flows of information in our networked lives? In the years and decades to come, the

answers to these questions will be driven in part by the quality of research on the social shaping of the Internet and its implications for society. We hope this book helps engage you in that enterprise. **(p.x)**

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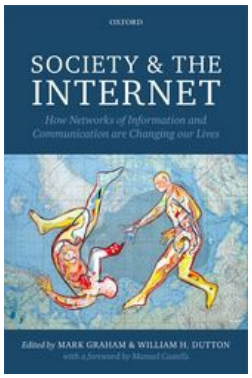

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(p.xi) Acknowledgments

This book is the outcome of collaboration across the Oxford Internet Institute (OII), one of the first multidisciplinary university-based departments of Internet Studies. The founding mission of the OII was to inform and stimulate debate over the societal implications of the Internet in ways that will shape policy and practice.

Society and the Internet arose through a lecture series that the editors organized for the department. The series was created initially to reach out to undergraduate students at the University of Oxford, as our teaching programs were aimed at graduate students. We wanted the OII to do more to enable Oxford students to engage with studies of the Internet and its societal implications from whatever field of study they might be pursuing at the University.

The editors took the lead in developing this lecture series over the course of two years. It was launched with a lecture on the cultures of the Internet by Professor Manuel Castells, an OII Distinguished Visiting Professor at that time. We are most grateful for his support and his foreword to this book, as well as to our other professors, fellows, and academic visitors, who contributed to this series.

As this series unfolded, we realized that our actual audience was far broader than the readers we had targeted, since the topics engaged a wide range of students, faculty, and the public. From feedback from those who attended our lecture series or viewed our webcasts, it was apparent that there was serious interest in the societal implications of the Internet. A growing awareness of the value of pulling together the expertise across the OII led to our commitment to reach an even wider audience through this collection.

In addition to the authors contributing to this volume, we are also very grateful to Barbara Ball's brilliant copy-editing, to Steve Russell for his art work for the OII and the cover of this book, Tim Davies for his assistance with our Internet timeline, and to our editors at Oxford University Press, including David Musson, Emma Booth, and their many colleagues, who were professional, skilled, and patient at every stage of the process of producing this book. We could not have asked for better support. Finally, without the enthusiastic and collegial contributions of the OII and all its faculty and staff, this book would not have been possible.

The Editors

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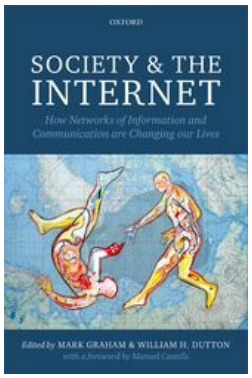

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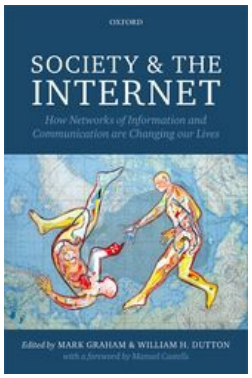

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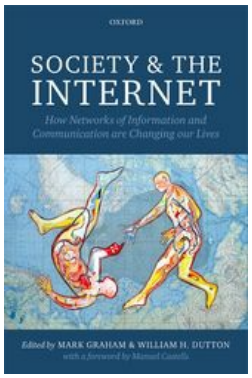

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(p.xix) List of Abbreviations

ADR
Alternative dispute resolution
AI
Artificial Intelligence
APEC
Asia-Pacific Economic Cooperation
API
Application Programming Interface
ATUS
American Time Use Society
COPPA
US Children's Online Privacy Protection Act
CPC
Conservative Party of Canada
CT
Communications technologies
DDoS

Distributed Denial of Service
DFID
Department for International Development
DUP
Democratic Union Party (Sudan)
EEA
European Economic Area
FPS
First person shooter game
GCIO
Government Chief Information Officer (New Zealand)
GOFAI
Good Old-Fashioned Artificial Intelligence
GSA
General Services Administration (US Federal Government)
GSP
Generalized second price
HTML
Hypertext Markup Language
IaaS
Infrastructure as a Service
ICT
Information and Communication Technology
ICT4D
ICT for Development
IGF
Internet Governance Forum
IM
Instant Messenger
IR
Information Retrieval
ISP
Internet Service Provider
IT
Information technologies
ITU
International Telecommunication Union
LPC
Liberal Party of Canada
MFA
Multi Fibre Arrangement
MMORPG
Massively multiplayer online role-playing game
NCP
National Congress Party (Sudan)

NGU
Next Generation User
NIF
National Islamic Front (Sudan)
(p.xx) ODR
Online dispute resolution
OECD
The Organization for Economic Co-operation and DevelopmentOII Oxford Internet Institute
OLPC
One Laptop per Child
OMB
Office of Management and Budget (US Federal Government)
OxIS
Oxford Internet Survey
PaaS
Platform as a Service
PHP
Pre-Hypertext Processing
PII
Personally Identifiable Information
QA
Question Answering
RISJ
Reuters Institute for the Study of Journalism
SaaS
Software as a Service
SMS
Short message service
SNS
Social network site
SOPA
Stop Online Piracy Act
SW
Semantic (alternatively, Data) Web
UGC
User Generated Content
UNCTAD
The United Nations Conference on Trade and Development
URI
Uniform Resource Indicator
URL
Uniform Resource Locator
USSD
Unstructured Supplementary Service Data

VOD
Video on Demand
WIP
World Internet Project

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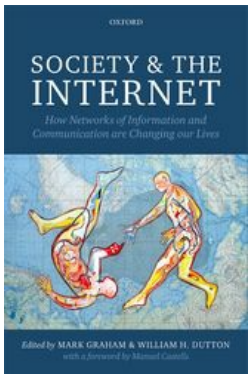

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