



Edited by
Daniel Araya
Yana Breindl
Tessa J. Houghton

Nexus

NEW INTERSECTIONS
IN INTERNET RESEARCH

Introduction

Collective Intelligence

DANIEL ARAYA

Taken together, the global reach of digital technologies and the rising influence of networked collaboration constitute a new mode of information production that is reshaping industrial societies. Beyond the command-and-control systems characteristic of industrialization, information and communication technologies (ICTs) have become fundamental to a network age (Castells, 1996). Underlying this socioeconomic restructuring is the critical importance of digital networks as platforms for creative collaboration.

New tools inevitably engender changes in the way people interact, communicate, and collaborate (Wenger, 1998). However, it is increasingly clear that ICTs are now leveraging a unique democratic shift in a wide array of technological, political, and social spaces. This edited collection interrogates the current ways mass collaboration intersects with sociocultural, technosocial, and political changes in the context of new social practices. Intertwined with these new practices are questions about the impact of ICTs on established institutions and modes of production.

Much like the invention of the printing press, the Internet is radically transforming the most basic elements of modern civilization. The success of mass collaboration in a multitude of contexts poses a challenge, not only to the dominant economic paradigm, but also to a broad range of received social science thinking. There is mounting evidence that new forms of social networking bind people together in highly creative social and economic relationships. People are no longer

passive participants in their own economic and cultural production, but are becoming active agents in the production of lived social and political environments.

THE RISE OF COLLECTIVE INTELLIGENCE

For many, the Internet represents a sociotechnological platform on top of which the knowledge, resources, and computing power of millions of people are coming together into a massive collective force (Tapscott & Williams, 2006). Just as new systems of meaning-making emerged with the printing press, the Internet is generating new cultural forms, and reorganizing the basic mechanisms of cultural power. As Yochai Benkler (2006) has pointed out, the distributed nature of ICTs is giving rise to a democratic shift in “peer production” that is opening cultural life to new modes of creativity and innovation. This trend is not only obvious in the context of software and information production (most notably in the free and open-source software movement) but also physical production in the context of user-led innovation (Von Hippel, 2005).

The growing opportunities for amateur producers to work together in scaled collaboration are changing institutions as widespread as journalism, education, government, healthcare, communications, and entertainment. Energized through peer-to-peer collaboration, the Internet is enabling new forms of decentralized and amorphous self-organization that is impacting a wide range of institutions and practices (Leadbeater, 2000). As these effects permeate contemporary society and intersect with deep structural changes in the global economy, we are observing a significant restructuring of mass industrial society. Researchers are now challenged to develop new models for describing and understanding these changes. What theories and tools do we have today to help us explain this cultural shift?

One of the more ambitious attempts to interpret these trends is Pierre Lévy’s (1997) early work on the subject of “collective intelligence.” As Lévy suggests, collective intelligence underlies a new paradigm that is emerging in various fields of research simultaneously,

Far from being exclusive, the expression “collective intelligence” relates to an extensive body of knowledge and thoughts concerned with several objects that have been diversely labeled: distributed cognition, distributed knowledge systems, global brain, super-brain, global mind, group mind, ecology of mind, hive mind, learning organization, connected intelligence, networked intelligence, augmented intelligence, hyper-cortex, symbiotic man, etc. Notwithstanding their diversity, these several rich philosophical and scientific contemporary trends have one feature in common: they describe human communities, organizations and cultures exhibiting “mind-like” properties... (p. 1)

For Lévy, the World Wide Web represents the emergence of a semantic commons that is gradually enabling the whole of humanity to house and manage its cultural heritage. As sociocultural theorists suggest, human cognition is indistinguishable from ongoing sociocultural practices because it is anchored to social tools and artifacts (Lave, 1988; Lave & Wenger, 1991; Varela, Thomson, & Rosch, 1991). For these researchers, whole systems of artifacts (words and numbers) form the basic foundations for shared cultural cognition. Just as new tools of labor facilitate new social structures, new tools of thinking facilitate new cognitive structures. This tool-mediated understanding of human cognition is even more obvious today. With the emergence of worldwide ICT networks, systems of cultural cognition are becoming increasingly global (Robertson, 1992).

THE GLOBAL MAP

There are now an estimated 1.4 billion Internet users in the world today, with growth in developing countries expanding at five times the rate of developed countries (developing countries now account for more than half of the world total of Internet users) (UNCTAD, 2009, p. 11). China is now the world's single largest broadband market and has the largest number of Internet users (298 million), followed by the United States (191 million) and Japan (88 million) (*ibid.*). Wide gaps in ICT infrastructure (especially in broadband networks) remain, however. While the Internet is undoubtedly expanding in reach and density, access remains fragmented and uneven. Gaps in broadband connectivity between high-income and low-income countries, for example, are only widening. Average broadband penetration is more than eight times higher in developed than in developing countries.

Many people now see technology as a key to negotiating problems in the twenty-first century. While technology may solve some problems, however, it can also magnify others. Today the vast majority of the world's population remains disconnected from ICTs. Access to ICTs is largely divided along economic lines. While more than half the population in the developed world is now online, only 15 to 17 percent of people in developing and transition economies are online (UNCTAD, p. 11). There is reason to suggest that this is not a permanent trend, however. The spread of mobile telephony, for example has been explosive. There are more than four billion mobile phone subscribers in the world today:

On average, there are now 60 subscriptions per 100 people, and in many developed, developing and transition economies penetration exceeds 100. Reflecting explosive growth, the penetration level in developing countries is now eight times higher than what it was in 2000. Almost every second person in developing countries is thought to have a mobile phone and

fewer than a dozen developing nations have a mobile penetration of less than ten. Between 2003 and 2008, the most dynamic economies in terms of increased mobile penetration were outside the developed world. (UNCTAD, 2009, p. 11)

Part of this is explained by the high rates of economic growth in many emerging economies. One can only assume that the impact of emerging economies in the twenty-first century will be considerable. By 2050 the combined economies of Brazil, Russia, India, and China could eclipse the combined economies of the current richest countries. China already has the largest foreign exchange reserves and it has overtaken the United States and Germany to become the world's largest exporter. In 2009, China became the second largest economy in the world and it is predicted to become the world's largest (followed by India) by the middle of this century.

COMPLEXITY AND INTERNET RESEARCH

ICTs are proliferating at an incredible rate. Consider, for example, the incredible growth of the World Wide Web. The Web represents an emergent phenomenon that is highly resistant to linear models of inquiry. Researchers today are beginning to develop new models for describing and understanding these complex dynamics. One important resource for modeling this is found in the science of complex systems. While traditional methods of research often assume that systems under study are characterized by some kind of order and stability, complex systems are often unpredictable. At no point do complex systems come to a natural equilibrium or stasis.¹

Unpredictability and change are critical to understanding complex systems because transformation is often a consequence of the feedback arising from the shifting relationship of agents within the system. Complex systems are “hierarchical” systems in which the parts of a network (individuals, groups, etc) are greater than their sum. This includes the behavior of those parts and the emergent behavior of the system as a whole (Laszlo, 1996). Theorists in the social sciences using arguments based in complexity suggest that linear methods of analysis miss embedded elements such as contingency and multicausality. Studies anchored in a positivist methodology, for example, often overlook the situated environment in which systems unfold and develop (Barnes, Matka, & Sullivan, 2003).²

Complexity science offers one of the few tools we have for understanding the interactivity and flux that make up the social dimensions of Internet-related phenomenon. “*Think of the spontaneous organization* of half a million ants or termites, which allows them to construct complex hills and nests” (Ferguson, 2010, p. 24). Nothing commands the Internet; instead, the interaction of a multitude of individ-

ual agents combine to form a higher level of collective intelligence. While peer producers may be structurally dependent on technological systems, for example, they are also critical agents in the ongoing construction of those systems (Giddens, 1984).

The value of complexity science to Internet research is that it offers a dynamic middle ground between the reductionism of positivism and the ambiguity of post-structuralism (Bhaskar, 1997; Haynes, 2007). In the context of this volume, complexity thinking is useful for understanding the emergent forms of collective intelligence that underlie a large degree of Internet-related phenomena. These emergent intelligences are critical to understanding the reason Internet research is interesting to so many researchers across the disciplinary spectrum.

NEXUS: NEW INTERSECTIONS IN INTERNET RESEARCH

To better contextualize the chapters found in this volume, we must first recognize the tremendous diversity of disciplines that come under the umbrella of Internet research. The term “Internet Studies” is used in a flexible way by many different disciplines and for different purposes. In many ways, this disciplinary fragmentation reflects the origins of the Internet itself. The Internet consists of networks of interdependent nodes that conform to simple rules of behavior, but together exhibit emergent, system-wide behavior.

While simultaneously drawing and building from other research streams (computer-supported cooperative work, human-computer interaction, cyberspace, digital culture, new media studies, etc.), Internet research continues to evolve into what can only be called a meta-field of study. In this regard, this volume does not focus simply on a single key area but instead, seeks to comprehend the relationships, intersections, and interdependencies between multiple technology-mediated domains. The contributors represent a wide spectrum of disciplines but share a strong premise that ICTs are introducing discrete and coherent changes in varied environments.

The various approaches in this volume challenge readers to think outside disciplinary and methodological boundaries while at the same time recognizing an underlying unity that links the research. While some authors expose the social, political, and economic inequities that are often amplified by technology, others examine the widespread structural changes to institutions, practices, and policymaking. While studies of the Internet are now widespread across academic disciplines, there is a growing collaboration between investigators. This volume is one such example in what is hoped will be an ongoing multidisciplinary and transdisciplinary trend.

ORGANIZATION OF THIS BOOK

Section One: Sociocultural Intersections

Section One explores the *Sociocultural Intersections* of Internet research. New tools engender changes in the way people and communities interact, communicate, and construct their identities. In this section, we explore the ways in which ICTs enable transformations in existing sociocultural practices.

In Chapter 1, Geneve and Ganito provide insight into two empirical studies exploring women and technology. They explore women's participation through a lens of agency, where they argue that identities are influenced by both enablers and constraints to conform (to) or transform such influences. They provide an account of women's experiences with technology within a specific social context, through the conceptual categories of the Five Acts of Agency and emerging theory of Digital Agency.

In Chapter 2, Garduño and Cook argue that social networks such Flickr function as public repositories of personal photography that challenge and democratize the authority of traditional institutions of memory, like libraries and museums. Vernacular photography on these systems increases the visibility of individual's self-representation. In contrast to institutional collections, members on Flickr self-select the subject matter in their photographic contributions, the methods of representation, and the modes of participation.

In Chapter 3, Petzold and Liao look at linguistic aspects of the Internet and consider methods to measure this kind of activity on a large scale by using tools that can help generate this information. Preliminary analysis shows, for example, a relatively low overlap between Asian and European language versions of Wikipedia. Thus, they suggest, the concept and measurement of linguistic connectedness between Wikipedia nodes (different language versions) requires further explanations for the field of Internet studies.

In Chapter 4, Morieson and Usher consider the possible range of outcomes that can occur when the institution of news and the communicative possibilities of the Internet intersect. They explore the important nexus of cultural production and new communication technology, by mapping the current state of the media in the United States and Australia. Their aim is to provide a broad overview of the issues facing news as an institution, with particular reference to the threats and opportunities afforded by the development of the Internet.

Section Two: Technosocial Intersections

Section Two examines *Technosocial Intersections*. ICTs have become integral parts of a wide array of sectors. Networked technologies are being used for educational pur-

poses or in order to improve health care delivery. They challenge the traditional media system, and certain phenomena such as personal blogging give birth to new commercial practices. This chapter discusses the wider repercussions ICT use has had on these domains.

In Chapter 5, Monroy-Hernández, Dezuanni, and Kuikkaniemi explore learning technologies, focusing on the ways young people participate in online and face-to-face spaces and how this can inform the design of social and creative learning technologies. In this context they discuss three specific social environments where young people create interactive media and gain new media literacy skills.

In Chapter 6, Camerini and Nam explore the topic of Internet technology in the health communication domain, generally referred to as eHealth. They lay out the implications, positive and negative, of a proliferating adoption of innovative technologies in bridging the divide between current performance and legitimate expectations in health care delivery.

In Chapter 7, Hopkins and Thomas locate and analyze a particular nexus in Malaysian blogging practices: the monetization of blogs, in particular the emergence of the “Lifestyle” blog. Drawing upon long-term ethnographic research, they consider the dynamics of this process by alternately using actor-network theory (ANT) and Bourdieuan field theory to trace relevant material-semiotic traffic between actors. They conclude by highlighting how social-symbolic capital exchange underwrites “authenticity” in Malaysian blogging, coming to focus also on how server logs quantify this capital circulation.

In Chapter 8, Kee, Cradduck, Blodgett, and Olwan provide a theoretically generative definition of cyberinfrastructure (CI) by drawing from existing definitions and literature in social sciences, law, and policy studies. They propose two models of domestic and international influencers on CI emergence, development, and implementation in the early 21st century. Based on its historical emergence and computational power, they argue that cyberinfrastructure is built on, and yet distinct from, the current notion of the Internet. The authors seek to answer two research questions: firstly, what is cyberinfrastructure? And secondly, what national and international influencers shape its emergence, development, and implementation (in e-science) in the early 21st century? Additionally, consideration will be given to the implications of the proposed definition and models, and future directions on CI research in Internet studies will be suggested.

Section Three: Political Intersections

Section Three examines political intersections. ICTs engender changes in the way polities construct themselves. In this section, we explore research that examines the

ways in which ICTs enable transformations in existing political and policy practices.

In Chapter 9, Breindl and Gustafsson explore the influence of the Internet on traditional decision-making. While these forms of networked political organisations are usually perceived as less hierarchical than traditional mobilising groups, they point out the fact that successful forms of networked digital activism can be heavily dependent on technical and networking skills. Rather than functioning as the base of more egalitarian politics, the growing importance of networked political activism aided by digital media may on the contrary create new elites.

In Chapter 10, Houghton and Chang examine alternate perspectives on hacking, hacktivism, and cybercrime. Houghton assesses the case of hacktivism concerning territorial disputes centering on the People's Republic of China, and contends that hacktivism is a democratic activity in that it constitutes the emergence of multiple "neo-Habermasian" counterpublic spheres. In contrast, Chang explores hacking through a cybercrime lens, assessing difficulties with legislation and institutional self-protection against cybercrime, and making suggestions for overcoming these challenges.

In Chapter 11, Araya, Shang, and Liu consider U.S. and Chinese policy in the context of green innovation and a green economy. Many countries today are aggressively pursuing green innovation strategies because of the potential social and economic benefits associated with harnessing green technologies. Looking critically at economic policies in the U.S. and China, the authors consider current strategies for advancing green innovation. Much as ICTs have underwritten globalization and reshaped industrial societies, they argue that ICTs are foundational to a green economy.

SUMMARY

There is an emerging consensus that Internet research necessarily transcends single disciplines. Information and Communication Technologies are transforming the way we live, work, and play, and as research on the Internet converges with other disciplines, new discourses are forming regarding technology's growing significance. New tools inevitably engender changes in the way people interact, communicate and collaborate, and it is increasingly clear that the Internet is providing new spaces for research that require new models of interpretation. Just as new systems of meaning-making emerged with the printing press, the Internet is generating new cultural forms, and introducing new forms of cultural power. While there is still no common definition of the term *Internet Studies*, the authors in this volume have endeavored to contribute to and advance this growing field.

NOTES

1. As Eoyang and Berkas (1998) observe, complex systems have more in common with permanent whitewater or unshackled action than predictability. The dynamic nature of complex systems means that researchers cannot isolate the underlying factors that determine outcomes. Since complex systems are open systems, boundaries must often be defined arbitrarily. Factors outside a system's boundaries may have as much influence on the behavior of a complex system as the dependent and independent variables within it.
2. Similarly, research linked to a managerial or policy focus often overestimates the capacity of human agency to steer complex systems (including the Internet).

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