

# 1 Introduction

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## 1.1 Book Synopsis

Web search engines have emerged as one of the dominant technologies of modern, digital life, providing doorways to the universe of information available online. According to the Pew Internet & American Life Project, 84% of American adult Internet users have used a search engine to seek information online (Fallows 2005: 1). On any given day, more than 60 million American adults send over 200 million information requests to Web search engines, making Web searches second most popular online activity (behind using e-mail) (Rainie 2005).

More than just an indispensable tool for finding and accessing information online, Web searching has also become a defining component of the human condition. Web searching can be conceptualized as a complex behavior embedded within an individual's everyday social, cultural, political, and information-seeking activities. Following this broad impact of Web searching on daily life, the scholarly study of Web searching spans a multidisciplinary collection of researchers from the social sciences, media and cultural studies, law, information science and other related disciplines. *Web Search: Multidisciplinary Perspectives* brings together chapters that represent this range of multidisciplinary theories, models, and ideas about Web searching, drawing out and examining the various roles and impacts of Web searching on the social, cultural, political, legal, and informational spheres of our lives, such as the impact on individuals, social groups, modern and postmodern ways of knowing, and public and private life. By critically examining the issues, theories, and formations arising from, and surrounding, Web searching, *Web Search: Multidisciplinary Perspectives* represents an important contribution to the emerging multidisciplinary body of research on Web search engines.

Not surprisingly, some of the earliest research publications on Web search engines were technical in nature. Numerous computer scientists have contributed not only valuable research on improving and enhancing the underlying Web search engine technology (Brin and Page 1998; Heydon and Najork 1999; Page et al. 1998), but also technical analyses of the extent of coverage achieved by search engine products and how it relates to information access (Kleinberg and Lawrence 2001; Lawrence and Giles 1998, 2000).

Social studies of Web search engines quickly emerged, typically by information scientists attempting to isolate the habits and characteristics of search engine users through the analysis of transaction log data (Jansen and Pooch 2001). These include Hoelscher's (1998) analysis of 16 million queries from the German search engine Fireball; Jansen et al. (2000) study of a sample day's worth of search activity from the Excite search engine; and Silverstein et al. (1999) detailed analysis of one billion queries submitted to the Alta Vista search engine over a 42-day period. These studies of transaction log data provide valuable information about search query structure and complexity, including insights about common search topics, query length, Boolean operator usage, search session length, and search results page viewing (Spink and Jansen 2004).

Notwithstanding the value of transaction log data analysis, these types of studies offer limited insights into the behavior of Web searchers beyond the search queries submitted. Hargittai's (2002, 2004) use of surveys and in-person observation of search engine usage helps alleviate these shortcomings, providing insights into how people find information online in the context of their other media use, their general Internet use patterns, and their social support networks. Broadening the analysis of user behavior beyond transaction logs allowed Hargittai (2004) to reveal the ways that factors such as age, gender, education level, and time spent online are relevant predictors of a user's Web searching skills. The work of Machill et al. (2004) and Hölscher and Strube (2000) also combined surveys, interviews, and transaction log analysis to characterize a number of information seeking behaviors of Web search engine users.

Recent scholarship has moved beyond the technical and individual focus of the user studies described above to include research into broader cultural, legal, and social implications of Web search engines. For example, cultural scholars (Hellsten et al. 2006; Wouters et al. 2004) have explored the ways in which search engines "re-write the past" due to the frequent updating of their indices and the corresponding loss of a historical record of content on the Web. Introna and Nissenbaum's (2000) seminal study, "Shaping the Web: Why the Politics of Search Engines Matter," was among the first to analyze search engines from the political perspective, noting how search engines have been heralded as "a democratizing force" that will

...give voice to diverse social, economic, and cultural groups, to members of society not frequently heard in the public sphere. It will empower the traditionally disempowered, giving them access both to typically unreachable nodes of power and to previously inaccessible troves of information. (Introna and Nissenbaum 2000: 169)

Search engines, then, act as a powerful source of access and accessibility within the Web. Introna and Nissenbaum reveal, however, that search engines "systematically exclude certain sites and certain types of sites, in favor of others, systematically giving prominence to some at the expense of others" (2000: 169).

Such a critique resembles the stance that political economists take against the contemporary mass media industry (Castells 1996; Habermas 1992; McChesney 1999), a critique that has recently been extended to Web search engines. For example, Hargittai (2004) has extended her user studies to include investigations of how financial and organizational considerations within the Web search engine industry

impact the way in which content is organized, presented, and distributed to users. And Van Couvering (2004) has engaged in extensive research on the political economy of the search engine industry in terms of its ownership, its revenues, the products it sells, its geographic spread, and the politics and regulations that govern it. Drawing comparisons to concerns over market consolidations in the mass media industry, Van Couvering fears that the market concentration and business practices of the search engine industry might limit its ability to serve “the public interest in the information society” (Van Couvering 2004: 25).

Extending from these social and cultural critiques, Web search engines have also recently been scrutinized from a moral or ethical perspective. A recent panel discussion at the Santa Clara University Markkula Center for Applied Ethics was one of the first to bring together ethicists, computer scientists, and social scientists for the express purpose of confronting some of the “unavoidable ethical questions about search engines,” including concerns of search engine bias, censorship, trust, and privacy (Norvig et al. 2006). A special issue of the *International Review of Information Ethics* on “The Ethics of Search Engines” (Nagenborg 2005) brought into focus many of the particular privacy concerns with search engines.

*Web Search: Multidisciplinary Perspectives* contributes to this rich library of research by showcasing the latest multidisciplinary theories, models, and perspectives on Web searching. Unlike many volumes on Web search engines, our book does not provide an analysis of Web searching from computer science or other Web-related technological disciplines. Rather, *Web Search: Multidisciplinary Perspectives* is focused on investigating Web search from the non-technological perspective. The editors focused on collecting papers that broaden and deepen the framework for our understanding of Web search, and invited authors from many disciplines to contribute chapters that represented emerging research directions and ideas, in an effort to build a perspective that extends beyond traditional models and research, and provide new directions for further research. In particular, the book includes papers by outstanding, yet often less established, researchers from different disciplines who challenge the established views and paradigms of Web search research. The chapter authors – as well as the editors – are drawn from the international boundaries of Web search scholarship, and this global perspective contributed greatly to the multidisciplinary depth of the volume.

## 1.2 Book Outline

*Web Search: Multidisciplinary Perspectives* is organized into five sections. Following this introductory section, Part II presents chapters that provide social, cultural and philosophical perspectives for conceptualizing Web search. Alejandro Diaz’s “Through the Google Goggles: Sociopolitical Bias in Search Engine Design” provides an opening examination based in communication and political theory on how bias in search engines – Google, in particular – might threaten the utopian and democratic ideals associated with the Web. In “Reconsidering the Rhizome: A Textual Analysis of Web Search Engines as Gatekeepers of the Internet,” Aaron Hess

performs a textual analysis of four major search engines to determine how they might resemble Deleuze and Guattari's notion of the rhizome. Rosa Mikeal Martey's contribution, "Exploring Gendered Notions: Gender, Job Hunting and Web Searches," argues that the social and cultural contexts of both the search tools and the search tasks impact how these Web-based technologies serve women in their information-seeking needs. The philosopher Lawrence Hinman provides a necessary ethical analysis of Web searching in his contribution, "Searching Ethics: The Role of Search Engines in the Construction and Distribution of Knowledge," while Michael Zimmer's chapter, "The Gaze of the Perfect Search Engine: Google as an Infrastructure of Dataveillance," focuses on the particular ethical concern with the privacy and surveillance implications Web search engine practices.

Part III includes chapters that propose political, legal, and economic perspectives for understanding Web search. The first contribution, "Search Engine Liability for Copyright Infringement" by Brian Fitzgerald, Damien O'Brien, and Anne Fitzgerald, provides a broad overview of the topic of search engine liability for copyright infringement. Eric Goldman's contribution, "Search Engine Bias and the Demise of Search Engine Utopianism," provides an additional legal analysis of Web search, using legal theory to support the position that search engine bias can be a beneficial consequence of how Web search engines increasingly customize content for individual users. In "Search Engines, Chance Exposures and Emergent Organizations," Azi Lev-On relies on political theory to reveal how search engines can provide unplanned exposures to diverse viewpoints, as well as empowering what he calls "organizational hubs of collective action." Paul Reilly continues this political analysis of Web searching by discussing the relative "visibility" of organizations on search engines in his contribution, "'Googling' Terrorists: Are Northern Irish terrorists visible on Internet Search Engines?" Finally, Elizabeth Van Couvering's chapter, "The History and Geography of the Internet Search Engine: Processes of Consolidation and Processes of Expansion," provides a detailed historical and economic analysis of Web search engines, drawing out concerns over the commercialization and consolidation of the search engine industry.

Part IV presents explorations of Web searching from the information behavior perspective. The section opens with Shirlee Knight and Amanda Spink's chapter, "Towards an Integrated Information Behavior Model of Web Search," exploring the history of information retrieval research in order to propose a "macro model" of Web-based information seeking and searching behavior. In "Web Searching for Health: Theoretical Foundations and Connections to Health Related Outcomes," Mohan Dutta and Graham Bodie utilize theories of information seeking to determine how search engines might fit within an "integrative model of health information seeking." Jenny Fry, Shefali Virkar, and Ralph Schroeder follow with "Search Engines and Expertise about Global Issues: Well-defined Landscape or Undomesticated Wilderness?", an investigation of the "winner-takes-all" effect in online information resources to help determine if search engines function as facilitators in accessing expertise or as influential gatekeepers. "Conceptual Models for Search Engines," by David Hendry and Efthimis Efthimiadis, examines the conceptual and technical understanding that people have of search engines to measure levels of "literacy" of

Web search engine design and practices. Finally, Dirk Lewandowski and Nadine Höchstötter propose and evaluate various quality measures for Web search engine performance in their contribution, “Web Searching: A Quality Measurement Perspective.”

In Part V the editors provide a concluding overview of the key trends, theories and models emerging these multidisciplinary studies, along with a range of new directions proposed in the chapters for further research.

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