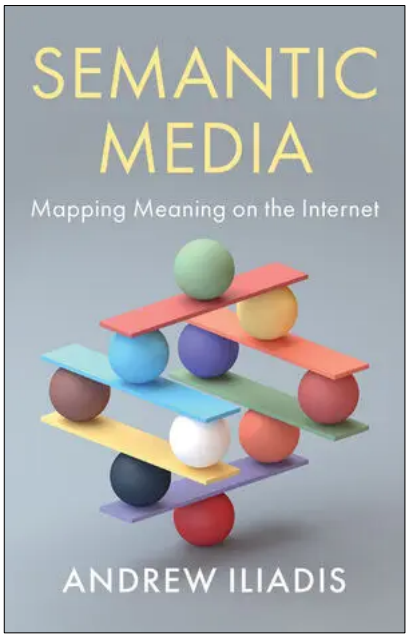
International Journal of Communication 18(2024), Book Review 3915-3917 1932–8036/2024BKR0009

Andrew Iliadis, **Semantic Media: Mapping Meaning on the Internet,** London, UK: Polity, 2022, 220 pp., $22.95 (paperback).

Reviewed by
Dechun Zhang
Leiden University



Digital technologies are becoming increasingly central to shaping contemporary life. While previous studies have extensively examined how these technologies construct digital societies, there is still a notable gap in systematic inquiries into the practices of major technology firms and the broad social and political implications of their control over the spread of information. Andrew Iliadis's book, ***Semantic Media: Mapping Meaning on the Internet***, studies this critical topic, exploring the growing field of meaning-making technologies and the operational strategies employed by excellent tech giants such as Apple, Google, Facebook, Amazon, and Microsoft. The book examines how major IT companies systematically collect and organize information for digital platforms, employing algorithms and logical data modeling to influence content prioritization and delivery. Iliadis highlights how these design choices impact the structure and presentation of information, raising important questions about control, governance, and public access to information. Central to his analysis is the examination of the infrastructure frameworks that support this organization, revealing how these frameworks shape public perception and understanding. Overall, this book provides insights into the technical environment that will shape the social and political dynamics of the future.

The author defines *semantic media* as technologies that directly present facts, answers, meanings, and "knowledge" within media products rather than simply directing users to other sources. In addition, the book delves into semantic theory and technology to explain how these media are structured and function. In the first of the five chapters of the book, semantics history is methodically examined, presenting the term "semantics," which mostly originates from the book of Bréal (1897) and means to indicate, point out, or show by sign; sema is a symbol, mark, or token. In addition, the chapter introduces early semantic technologies and infrastructures, discusses the ongoing injustices and sociocultural biases associated with unequal knowledge representation, and examines important subjects including the World Wide Web Consortium, the Semantic Web movement, and linked data. It also details the subjects, predicates, and objects that constitute semantic media.

In chapter 2, the book details how major Internet companies use proprietary knowledge graphs to infuse their media products with semantic depth, highlighting the transition from an open semantic Web to a more closed environment controlled by walled gardens and gatekeepers. Knowledge graphs are a powerful tool for efficiently storing and managing information. The discussion highlights Alphabet's (Google's) Knowledge Graph, along with insights into different knowledge base technologies and their

significant impact on media consumption patterns and adoption rates. In addition to Google, other major players in the tech industry, including Apple, Amazon, Microsoft, Tencent, IBM, and Meta (Facebook), are actively using these technologies. In addition, the integration and use of knowledge graph technologies by popular application developers such as Airbnb, Pinterest, and Uber are examined. This widespread adoption raises concerns about the monopolization of knowledge dissemination and its impact on informational diversity. It prompts ethical questions regarding the influence of semantic media on user autonomy, potential biases within these systems, and their long-term effects on the digital information landscape. Overall, chapter 2 successfully outlines the technical and strategic aspects of knowledge graphs, prompting a critical reflection on the broader implications for the digital information landscape.

Chapter 3 highlights Schema.org project's role as the pioneering universal semantic metadata vocabulary for the Web. Schema.org functions on multiple levels: as a metadata vocabulary, an administrative body with representation from major Internet companies and volunteers, a comprehensive resource with code examples and version histories, and a tool widely used by Web administrators and developers (Iliadis et al., 2022). Its structured data model supports millions of websites and applications, significantly enhancing information search, retrieval, and crucial tasks such as misinformation verification and fact-checking (Adair, 2020). The chapter offers a thorough analysis of Schema.org's operational ties to Google, raising concerns about its independence and the implications of this relationship. It underscores the transformative effect of Schema.org on Internet data infrastructures, noting its impact on the organization and accessibility of online information. The chapter also includes a visual representation of Schema.org, exploring its structure and focus areas, and discusses its global significance, particularly in relation to fact-checking during events like COVID-19. While the chapter effectively details Schema.org's impact on data management and misinformation verification, it would benefit from a more nuanced exploration of how its centralized control might affect information diversity and introduce biases.

Chapter 4 explores Wikidata, a multilingual knowledge graph collaboratively edited and hosted by the Wikimedia Foundation. The chapter offers a comprehensive historical overview of the Wikidata project, explaining its technological foundations and the wider impact it has on Internet users. Wikidata serves as a knowledge base of facts that can be queried for results. It atomizes the unstructured language found in Wikipedia articles and across the entire knowledge base into discrete bits of semantic triples, allowing individuals to obtain quick answers, bite-sized knowledge, and specific data related to a particular question. As the underlying logical and informational infrastructure that supports the more verbose and descriptive Wikipedia, Wikidata contains packaged facts that align with Wikipedia's emphasis on transparency and information sharing. The chapter portrays Wikidata as a shining example of openness. This transparency not only builds trust but also makes structured knowledge more accessible, positioning Wikidata as a viable alternative to traditional data repositories in the digital ecosystem. Chapter 4 highlights Wikidata's significant impact on semantic media, emphasizing its ability to make structured information more accessible and promoting transparency and responsibility in digital knowledge management.

Chapter 5 explores the operational mechanisms and technological foundations that enable virtual assistants to effectively utilize semantic media technologies. It provides a historical overview of virtual assistants like Siri and Alexa, tracing their development from initial concepts to their advanced current

state. The chapter examines how these assistants organize information and leverage data from knowledge graphs, Schema.org, and Wikidata to deliver accurate and contextually appropriate responses. By integrating structured data models from various sources, virtual assistants better understand user intent and provide meaningful responses, thereby improving the overall user experience with digital platforms. The chapter thoroughly analyzes virtual assistants by examining their technological foundations, operational strategies, and sociocultural impacts. It highlights their transformative role in the digital landscape and explores how they embody the application of semantic media, offering insights into the future of AI-driven digital interaction and knowledge sharing.

Iliadis's book demonstrates that while artificial intelligence encompasses machine learning, natural language processing, robotics, and visualization, it also fundamentally involves logic, symbols, and knowledge representation. It reveals that media platforms are shaped by both algorithms and logical data modeling decisions, which are essential for their functionality. Iliadis highlights how major tech companies use semantic technologies to control information flow and urges readers to reflect on the broader implications for personal freedom, public discourse, and democratic governance. While the book calls for vigilance in addressing technological challenges, it would benefit from a more detailed discussion of actionable strategies for safeguarding democratic principles and a deeper exploration of their effects on personal freedom and democratic engagement. Overall, the book provides valuable insights into the influence of semantic technologies on media and democracy, underscoring the need to remain vigilant and actively address the challenges posed by technological advancements to protect democratic values.

References

Adair, B. (2020, December). *The future of fact-checking is all about structured data*. Retrieved from https://www.niemanlab.org/2020/12/the-future-of-fact-checking-is-all-about-structured-data/

Bréal, M. (1897). *Essai de sémantique* [Essay on semantics]. New York, NY: Hachette.

Iliadis, A., Acker, A., Stevens, W., & Kavakli, S. B. (2022). One schema to rule them all: How Schema.org models the world of search. *Journal of the Association for Information Science and Technology*, 1–64. Advance online publication. doi:10.1002/asi.24744