# Book Review

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**Handbook on Information Sciences**
**by: Peter Heisig**
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The *Handbook on Information Sciences* presents a comprehensive examination of the field, addressing core themes such as information organisation, data management, and emerging research trajectories. It critically explores the discipline's methodological evolution, with a particular focus on experimental approaches. The volume delves into foundational concepts, including materialist and semantic perspectives on information, classification theory, and document theory. It also analyses models of information-seeking behaviour, research methodologies, and information retrieval (IR) techniques. Contributions from leading experts further investigate public libraries as social institutions, information literacy (IL), the implications of the Fourth Industrial Revolution, and the intersection of information sciences with sustainability.

In Chapter 1, Peter Reising introduces the *Handbook on Information Sciences*, tracing the discipline's evolution from the Document Movement to its diverse research areas. These range from classical information organisation and user behaviour to contemporary fields like research data management, informetric, and data/text mining. The chapter highlights information seeking and retrieval, technology's role, and the importance of libraries for access. It notes the field's methodological diversity and emphasis on data/IL. Looking forward, information science must address challenges from the information society, the fourth industrial revolution, and sustainability. The handbook introduces these areas, emphasising the discipline's crucial role in tackling future societal challenges.

Carlo Alberto Avila Araujo charts information science's history through four stages: emergence, foundation, expansion/consolidation, and contemporary trends in Chapter 2. He proposes a systematic historical analysis, linking theoretical development, research areas, and institutions. Since its 1960s emergence, the field has matured, adapting to the changing information environment. The concept of information evolved from a physicalist systems focus to a cognitive, then contextual, understanding. Current perspectives recognise objective and cognitive dimensions, highlighting information's role in knowledge creation and its broader cultural impact.

Matthew Kelly's Chapter 3 explores fundamental information science concepts, beginning with the nuanced definition of 'information'. He examines retrieval, relevance,

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and aboutness, emphasising their theoretical and practical importance. Kelly clarifies information's role in user support by analysing its relationship with data and knowledge. Acknowledging historical context, he cautions against rigid definitions, advocating for refined relevance and aboutness to enhance digital engagement, literacy, and knowledge development.

Thiago Henrique Bragato Barros and Isadora Victorino Evangelista's Chapter 4 examines the modern history of classification, focusing on its role in knowledge organisation (KO). They explore its multiple meanings – process, system, and discipline – highlighting associated challenges. Through semantic and discursive analysis, they assess key concepts, theories, and authors, emphasising interdisciplinary research and renewed interest since the 1980s and 1990s.

In Chapter 5, Roswitha Skare explores document theory, tracing its evolution from the Latin 'Documentum' and its use in European bureaucracy. The author highlights the concept's changing applications since the early 20th century, including its decline and recent resurgence, especially with the growth of digital documents in Library and Information Science.

Charles Cole and Thomas D. Wilson examine information needs, distinguishing between search terms and actual needs in Chapter 6. They address the gap between user queries and real needs, categorising them as primary or secondary. The chapter presents two views: one, information need supports basic survival; the other, as a primary human need, driving connection to the external world, emphasising self-awareness and the quest for balance and understanding.

In Chapter 7, Hans-Christoph Hobohm explores information behaviour as a key area of study within information science, noting its substantial foundational knowledge. The field has benefited from interdisciplinary research, particularly from psychology, and has developed sophisticated theoretical models to explain human information behaviour. Hobohm highlights the broadening of research scope, moving beyond search and retrieval actions to encompass the influence of human personality and environment on informational interaction.

Joan C. Bartlett's Chapter 8 reviews prominent information-seeking behaviour models, a heavily researched area in information science. Since the 1990s, these models have broadened their scope, incorporating workplace, task-based, and everyday life contexts. Bartlett concludes by proposing future research avenues and stressing the importance of increased integration and synthesis in how the field is understood and assessed. She highlights the evolution of these models and their increasing relevance to diverse information-seeking scenarios.

In Chapter 9, Thomas Mandl and Julia Maria Struß examine IR technology, emphasising its profound societal impact as a foundation for text document access and web search. While core algorithms emerged in the 1970s, IR continues evolving with advancements like BERT language models. The authors explore IR's historical development, search engine architecture, indexing, weighting, matching, image search, evaluation metrics, user interaction, and future research directions, highlighting its intersection with natural language processing.

Brady D. Lund offers a historical overview of evolving research methods in information science, based on an analysis of seven leading journals spanning 1960–2020 in Chapter 10. Lund demonstrates the field's transformation from a 'one-paradigm science' dominated by quantitative, questionnaire-based methods to a more diverse landscape incorporating qualitative approaches. He explores this increasing

methodological diversity and concludes by discussing promising research methods that may shape the field's future direction.

In Chapter 11, Ilja Frissen, Catherine Henderson, and M. Max Evans examine experimental research in library and information science, emphasising theory testing as a key to valid inferences. Their chapter reviews experimental research, critically evaluates the field's current state based on recent studies, and attempts to reconcile the theory-practice gap. This reconciliation utilises a data-to-theory approach, consistent with the abductive theory of method discussed. They explore how experimental design contributes to knowledge building in the field.

Ulrike Wuttke, Stefan Schmunk, and Mirjam Blilmm examine the emerging field of research data management (RDM) as an overarching process of organisation, storage, preservation, and sharing of data collected and/or used in research projects. Chapter 12 aims to provide an overview of the (inter)national RDM landscape, covering research data centres, the GLAM sector (galleries, libraries, archives, and museums) as well as the arts and humanities. The chapter closes by addressing RDM skills and the implications of their development for curricular design, professional careers, and for information and library science as a growing professional practice.

Chapter 13 by David Gunnarsson Lorentzen and Gustaf Nelhans examines quantitative informetric research, exploring various indicators (e.g., publications, citations). They discuss the challenges of selecting appropriate indicators and the limitations of relying on single metrics. The authors advocate for a broader, contextual evaluation approach, moving beyond purely quantitative measures of research excellence. They emphasise the importance of understanding what an indicator represents and the need for researchers to consider more than individual-level analysis.

In Chapter 14, Martin J. Eppler explores information visualisation in three stages. He begins by outlining the rationale and advantages of information visualisation. He then presents common visualisation formats for diverse data types, including hierarchical, temporal, relational, multivariate (comparisons), geographic, and textual information. Finally, he discusses the potential pitfalls and risks of information visualisation and offers a perspective on future directions for the field. He emphasises the importance of effective visualisation for understanding complex data.

Chapter 15 by Peter Heisig explores knowledge management (KM) as a multidisciplinary field rooted in information science. He traces their shared history and overlapping areas, presenting key theoretical frameworks and illustrating ten prominent KM methods. He provides a concise overview of KM standards and concludes by examining current challenges and future research directions. Heisig emphasises the strong connection between KM and information science, highlighting their co-evolution.

Simon Y.K. Li and Eric Tsui explore data and text mining, focusing on pattern detection in unstructured text in Chapter 16. They highlight the importance of these techniques given the growth of text-based data and the limitations of statistical analysis. The authors examine integrating data/text mining with large language models to uncover insights. They discuss text mining's strategic benefits, including sentiment analysis and recommendations, and explore future directions like combining text mining with LLMs for natural language output.

Chapter 17 by Anne Goulding explores the evolution of public libraries as social institutions, from reading rooms to community hubs supporting connection and digital inclusion. Goulding argues their changing role reflects societal shifts and political

agendas. Despite predictions of decline, libraries remain vital and enjoy public approval. Their capacity for reinvention is key to continued relevance amid funding challenges and opposition. She highlights their adaptability and ongoing importance in communities.

Jesse David Dinneen explores the information society, where information drives decisions and innovation in Chapter 18. He identifies key challenges and examines how information institutions and research address them. These challenges – fake news, censorship, cybercrime, and surveillance – impact individuals and governments. Dinneen argues that information science and libraries are uniquely positioned to mitigate these issues through research and practice. He uses examples to illustrate the value of information professionals and researchers in navigating the information society.

Chapter 19 by Griesbaum et al. overviews IL as a key competency, outlining current research and its promotion in academia and everyday life. IL models emphasise holistic understanding, including epistemic and attitudinal aspects. The chapter discusses the interplay between ability, norms, and behaviour, highlighting the importance of evaluating expertise and recognising biases. It concludes by considering how AI and tools like ChatGPT are shaping IL's future, raising questions about knowledge production and necessary skills.

In Chapter 20, Tom Kwanya examines the future of information science education in the era of the fourth industrial revolution (4IR). He explores the impact of AI and robotics on work, addressing ethical and professional challenges. Kwanya highlights essential 4IR competencies, emphasising curriculum adaptation in LIS schools. He advocates for digital literacy, data curation, emotional intelligence, and practical training to equip graduates for the evolving information landscape.

The final chapter, initiated by the late Jan Nolin, is completed by colleagues from the Swedish School of Library and Information Science and this handbook. It addresses missed opportunities for information science in sustainability research, offering four arguments for aligning the field with sustainable development. The chapter highlights information's crucial role in key documents like Our Common Future and the Rio Declaration, and explores approaches for information scientists, focusing on and reviewing the 17 Sustainable Development Goals of Agenda 2030 in memory of Nolin's contributions.

Several other books also address critical issues. Lindgren (2023) offers a comprehensive overview of the current state of critical AI studies, emphasising the increasing relevance of critical social perspectives as AI permeates more areas of society and culture. In how data happened (Wiggins and Jones, 2023), the authors trace the history of data and statistics, examining their societal impact and the rise of data science in the digital era, while stressing the need for privacy, oversight, and regulation. Langer and Mukherjee (2023) discuss strategies for organisations to transition from product-centric to data-centric models, focusing on building data platforms and automating system components to foster innovation, enhance products, and navigate the evolving data landscape.

However, this handy handbook is an outstanding, comprehensive, and indispensable resource for students, scholars, and practitioners in computer science, economics, information sciences, KM, sociology, technology, and ICT. It seamlessly integrates foundational theories with practical methodologies, providing deep insights into information sciences and research practices. In essence, it serves as a definitive and invaluable, and handy reference.

## References

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