

Praise for *AI and Information Access*

'Information access is vital for work, study, and daily life. Libraries, along with search engines and mobile phones, have provided this access. However, users face information overload, relevance issues, and disinformation. Large language models provide on-the-fly content creation but can hallucinate and raise ethical concerns. In nine chapters, *AI and Information Access* explores these issues, along with tools, processes, practices, and how they relate to everyday life, teaching, and research. It is a timely book for information professionals interested in using and promoting AI responsibly.'

Professor Naresh Agarwal, School of Library and Information Science, Simmons University, Boston, USA

'In *AI and Information Access*, Gobinda and Sudatta Chowdhury, with their extensive expertise, cover an array of topics that introduce readers to the tools and processes for using AI to access information in conventional and novel ways. Users, the search process and critical thinking are addressed in everyday, scholarly and research contexts. They pragmatically share lessons learned, examples and scenarios before pondering whether AI introduces a paradigm shift in teaching, research and professional practices. It should be a fascinating read for educators and everyone working with information, and stimulate much-needed research.'

Professor Ina Fourie, Department of Information Science (iSchool), University of Pretoria, South Africa

'*AI and Information Access: Benefits, Challenges and Lessons* offers timely and insightful perspectives for information practitioners, researchers and students. Gobinda and Sudatta Chowdhury's latest book discusses how generative AI is transforming information seeking, retrieval, and use in different contexts, covering critical topics such as searching, prompt engineering and AI literacy, as well as the assessment and integrity of search results. Importantly, the book provides a balanced perspective of the opportunities afforded by generative AI and the challenges associated with its use. For those who wish to harness generative AI, this book is a must-have resource.'

Professor Dion Goh and Professor Chei Sian Lee, Wee Kim Wee School of Communication and Information, Nanyang Technological University, Singapore

'In an age of threatened democracies and rampant misinformation, this book makes for essential reading. It explores how AI – especially generative tools – can be harnessed critically to empower individuals, protect truth, and promote equitable access to information. As technology transforms how we search, learn, and decide, this timely work offers vital guidance for using AI responsibly in building an informed, just, and democratic society for all.'

Professor Koraljka Golub, Head of the iInstitute, Linnaeus University, Sweden

'As we enter and accelerate through the age of AI, it is imperative that information science professionals keep up with the critical applications and impact of AI on education and research. Information professionals who are directly involved in supporting libraries, memory institutions, R&D centers, and institutions of higher education need to understand how Generative AI is influencing their core activities now and how such activities may benefit by using Generative AI appropriately. The book offers timely, highly readable, and relevant content for information professionals to grasp the foundational Generative AI concepts and applications for information seeking and research tasks.'

Professor Javed Mostafa, Dean, Faculty of Information, University of Toronto, Canada

'Gobinda and Sudatta Chowdhury's new book *AI and Information Access: Benefits, Challenges and Lessons* explores the most pressing challenges for the 2020s, namely, how to harness the power of artificial intelligence. The work discusses AI in everyday life, but also examines its role in scholarly and research contexts, as well as considering its impact on information seeking behaviours and approaches, its potential influence on the information profession more generally, and the tools and technologies around its use and exploitation. This volume is a thoughtful contribution on a crucial topic for information science.'

Professor Peter Reid, School of Law and Social Sciences, Robert Gordon University, Aberdeen

'Everyone doing academic research today should read *AI and Information Access: Benefits, Challenges and Lessons* by Gobinda and Sudatta Chowdhury. It discusses how large language models (LLM) have changed the ways we search for information. The authors provide an introduction to contemporary artificial intelligence systems and include examples based on several research scenarios, including health and wellbeing, personal interest and environment and climate change. This book will help librarians, scholars and students.'

Professor Michael Seadle, Humboldt Universität zu Berlin, Germany, and former executive director, iSchools.org

'As AI is reshaping the contours of information science, this book reveals the transformative power of GenAI through a systematic and comprehensive examination of GenAI's benefits and challenges, supported by practical examples and rigorous analysis. This book is valuable for students, academics, and professionals, because it offers a forward-looking perspective on the future landscape of information science.'

Lihong Zhou, PhD, Professor, Associate Dean, School of Information Management (iSchool), Wuhan University, China

AI and Information Access

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information professionals.

AI and Information Access

Benefits, Challenges and Lessons

G. G. Chowdhury and
Sudatta Chowdhury

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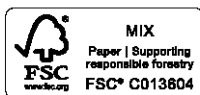
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To our parents –
Uma and Ananda
Anjali and Amar

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Introduction

The arrival of ChatGPT, a chatbot and virtual assistant developed by OpenAI, in November 2022 (<https://openai.com/index/chatgpt/>), has brought a new wave of transformative technologies that have a profound impact on all areas of life and activities involving data, information and knowledge. ChatGPT has the Generative Pre-trained Transformer (GPT) architecture as the foundation and is pre-trained on a broad spectrum of generalised, unlabelled and sometimes unvalidated data. These LLM (large language model)-based tools have the ability to create human-like content such as images, music, charts, tables and, programme codes, and answer questions in a conversational manner.

Typical information search processes assume an interaction cycle consisting of query specification, receipt and examination of retrieval results, and then either stopping or reformulating the query and repeating the process until a relevant result set is found. Conventional search systems used in libraries, database services and search engines are based on indices that map lexical tokens or semantic embeddings to document identifiers, and these indices are designed for retrieving relevant documents; whereas Gen AI-based chatbots support the integration of these documents into a holistic answer that are presented to the user in response to search queries or prompts.

So, what would be the impact of the Generative (or Gen) AI (Gen AI) tools for access to information? By undertaking an evidence-based approach and some typical use cases, and analysing the output generated by some chosen Gen AI tools for access to specific information in everyday life, research and scholarly contexts, this book discusses the implications of these technologies for the end-users, as well as the education and professional practices in library and information sciences.

The book is designed for students, academics, researchers and professionals in library science, information science, computer science, and cognate disciplines that deal with the design, delivery and management of

information systems and services. It takes a practical approach to demonstrate and critically analyse the benefits offered by the emerging Gen AI tools for information access, as well as the potential challenges and questions associated with the use of these tools.

The book comprises nine chapters. Chapter 1 provides a general introduction to Gen AI and briefly discusses how the Gen AI tools can be used for access to information. By providing some typical examples of information access through conventional library search services and scholarly databases, it discusses some fundamental differences between the Gen AI tools and conventional approaches to information access used in libraries, database search services and search engines. In the light of these discussions, the chapter mentions the key questions that are addressed in the book.

Chapter 2 sets the background for the rest of the topics, issues and challenges discussed in the book. It provides an introduction to information access by briefly touching upon the indexing and information searches processes. By drawing examples of some information searches in typical library services, scholarly databases, and search engines, the chapter discusses the various stages that a user has to go through to find information required in specific search contexts.

Several models and theories have been proposed over the past few decades that aim to describe how people seek and interact with various information sources, and the different stages of information search processes that people go through. These theories and models – that have informed the design of various information search systems, database services and search engines over the past few decades – demonstrate that people begin their information searches often with a vague notion of exactly what to search for and where, and the searches become more focused as they progress through different search sessions. Some of the well-known models and theories of information seeking and retrieval in the context of scholarly and everyday life information seeking are discussed in Chapter 3. The basic concepts of these models and theories are revisited later in the book to discuss how far these models and theories are applicable for information seeking using the Gen AI tools.

Chapters 4, 5 and 6 present the results of some case studies on information seeking for everyday life, and research and scholarly information contexts, using some chosen Gen AI tools. Chapter 4 shows the examples of some search sessions with five Gen AI tools – such as Claude, Copilot, Gemini, Perplexity AI and GPT-4o – based on three scenarios of everyday life information seeking: one on health and wellbeing; one on personal interest on an emerging topic, such as Generative AI itself; and another on a topic of common interest to life and society, such as environment and climate change. Query formulation or search prompts, the format and content of the

corresponding output, as well as the reliability and reputation of the cited sources, are discussed. These experiments and the corresponding findings are discussed later in this book in the context of the benefits and challenges of Gen AI for everyday life information seeking.

Chapter 5 presents the examples of the search output generated by seven Gen AI tools – Claude, Consensus, Copilot, Gemini, GPT-4o, Perplexity AI and Scholar GPT – based on two scenarios of scholarly information seeking, both for writing undergraduate coursework on a contemporary topic. Results generated by the chosen seven Gen AI tools are critically analysed to highlight the nature of the content, citations and the overall presentation of the output.

Chapter 6 presents the examples of the search output generated by the seven Gen AI tools based on two scenarios of research information seeking: one for preparing for an MA/MSc dissertation on an emerging topic such as Generative AI; and another for preparing for a PhD study on a contemporary topic such as environment and climate change issues. Query formulation or search prompts, the corresponding output, and their suitability in terms of the produced search results or content, and the reliability and reputation of the sources are discussed and critically analysed based on the specific search tasks and user contexts. These findings are discussed later in the book in the context of the benefits and challenges of Gen AI for research information seeking.

Chapter 7 discusses the results of the experiments reported in Chapters 4, 5 and 6. It discusses the typical steps that a user needs to go through to find information on a topic from library search services and scholarly databases. Drawing on the examples of searches presented in Chapters 4 to 6, it shows that Gen AI tools do not require the user to prepare a formal search query, select the target database(s) to search, find and decide on the relevance of the retrieved search output, and finally read and gather the required information from the retrieved items. Chapter 7 argues that most of these stages of information searches are not required for seeking information through the Gen AI tools; and, therefore, these tools have an obvious appeal to the users. However, the chapter points out some of the challenges and pitfalls associated with the use of Gen AI tools for access to information. The chapter also lists some guidelines produced by various libraries to support their users on the use of Gen AI tools.

By providing some simple examples of the search results produced by libraries and scholarly database services that a typical student, scholar or researcher might use to find relevant information on a topic, Chapter 8 shows how the user can control the search sessions, and use various features of the chosen search services, to get the best possible sets of results. By taking a closer look at the search query or prompt, and the corresponding output

generated by each chosen tool, the chapter discusses how the user should be prepared to assess the quality and reliability of the sources used to produce the search output, which by nature is new content generated by the tool based on the data and information from one or more retrieved items. The chapter further discusses some techniques – such as prompt engineering and RAG (Retrieval Augmented Generation) – for improving the outcome of the Gen AI tools in specific domains. Chapter 8 also discusses the potential legal and ethical issues associated with the search output generated by the chosen Gen AI tools, as well as the information and AI skills that users need to acquire in order to be able to use these tools effectively to find data and information for everyday life and/or research and scholarly activities.

Technology should amplify the best of us, but always on our terms, democratically decided and publicly debated with benefits widely distributed (Suleyman and Bhaskar, 2023, 61). Generative AI tools will have a profound impact on each of us, and especially in information- and data-intensive activities. Based on the discussions in the book, Chapter 9 addresses an obvious question: how the users, as well as the existing libraries and information services, should be prepared to adopt or adapt the Gen AI tools for accessing information. It also discusses the potential implications of the increasing use of the Gen AI tools for information access in everyday life, work, education, research and scholarly contexts. These, which have so far been user-driven, and libraries and database services have developed tools and training programmes to empower the user in searching and finding the most relevant information. Implications of this paradigm shift in information access and use for information science education and research in different areas, such as information seeking and retrieval, user education and training, as well as the privacy, security, copyright and other issues, are also discussed in Chapter 9.

Given its non-technical and evidenced-based approach to discuss the pros and cons of the use of Gen AI for access to everyday life, research and scholarly information, it is hoped that the book will have a global audience. The book will inform people involved in the knowledge and information sector about the benefits and challenges posed by the emerging Gen AI tools for information access, and how these tools can be adapted to meet the information needs and contexts of different user groups; and also what set of skills would the users need to be able to make optimum use of these tools. It is expected that the book will encourage information services management and professional staff to engage in new discussions and activities in order to adapt their services in the rapidly changing world of Gen AI, and to provide their users the best experience in accessing and using information and data relevant to their specific needs and contexts. It is also expected that the book

will encourage information science academics and researchers to engage in discussions on how the information science curricula and research agenda around information retrieval, information access, information seeking, information search process, information behaviour and cognate areas, need to be adapted and/or modified in the context of the widespread use of the Gen AI tools for access to information.

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