La-Net

LIS413

INDEXING AND ABSTRACTING

Download on the App Store

GET IT ON Google Play

Course video is available on our app

lanetonline.com

- **Course code:** LIS 413
- **Course title:** Indexing and Abstracting
- **Course unit load:** 2 Units
- **Series list:**

1. Series 1: Basic Concepts of Indexing and Abstracting
2. Series 2: Methods and Techniques of Indexing and Abstracting
3. Series 3: Thesaurus Design and Updating
4. Series 4: Types of Indexes and Abstracts
5. Series 5: Indexing and Abstracting Services and Evaluation

Series 1: Basic Concepts of Indexing and Abstracting

Part 1.1 Introduction to Indexing and Abstracting

- 1.1.1 Definition of indexing
- 1.1.2 Definition of abstracting
- 1.1.3 Importance of indexing and abstracting in information services

Part 1.2 Basic Concepts and Terminology

- 1.2.1 Key terms in indexing (e.g., index, descriptor, keyword)
- 1.2.2 Key terms in abstracting (e.g., abstract, summary, annotation)
- 1.2.3 Distinction between indexing and abstracting

Part 1.3 Historical Development and Scope

- 1.3.1 Early practices of indexing and abstracting
- 1.3.2 Evolution in print and electronic formats
- 1.3.3 Scope and application in modern libraries and information centres

Part 1.4 Principles and Functions

- 1.4.1 Principles guiding indexing
- 1.4.2 Principles guiding abstracting
- 1.4.3 Functions of indexes and abstracts in information retrieval

Introduction

lanetonline.com

Every time you search for information in a library catalogue or a digital database, you rely on indexing and abstracting to guide you to the right source. These processes form the backbone of information retrieval, ensuring that users can locate, access, and understand resources quickly and effectively. Without them, the vast collections of books, journals, and electronic resources would remain inaccessible and overwhelming. This Series introduces you to the fundamental concepts that underpin indexing and abstracting, laying the foundation for the rest of the course.

The aim of this Series is to familiarise you with the basic definitions, principles, and scope of indexing and abstracting, and to help you appreciate their importance in modern information services. By the end, you will have a solid grounding in the concepts and functions that make these processes essential to librarianship and information management.

We shall commence this Series by exploring the definitions of indexing and abstracting, and highlighting their importance in information services. Next, we will move on to basic concepts and terminology, clarifying key terms and distinguishing between the two processes. Following that, we will examine the historical development and scope of indexing and abstracting, tracing their evolution from early practices to modern applications. Finally, we will wrap up by considering the principles and functions that guide these processes, showing how they contribute to effective information retrieval.

- Define indexing and abstracting as core processes in information retrieval,
- Explain the importance of indexing and abstracting in library and information services,
- Identify and describe key terms and concepts used in indexing and abstracting,
- Distinguish clearly between indexing and abstracting in terms of purpose and application,
- Analyse the historical development and scope of indexing and abstracting from early practices to modern formats, and
- Explain the principles and functions that guide indexing and abstracting in effective information management.

1.1 Introduction to Indexing and Abstracting

Indexing and abstracting are fundamental processes in information management. They provide the tools and techniques that make it possible for users to locate, access, and understand resources efficiently. In this Part, we will define these concepts, explain their importance, and set the stage for deeper exploration in later Parts of the Series.

1.1.1 Definition of indexing

Indexing is the process of creating an organised list of terms or descriptors that represent the content of a document or resource. These terms act as access points, enabling users to retrieve information quickly. Indexing can be manual, where a human selects appropriate terms, or automated, where computer algorithms generate descriptors.

Fill in the blank:

lanetonline.com

- Indexing is the process of creating an organised list of _____ that represent the content of a document.

[Insert figure here] Short description: Diagram showing the process of indexing, from document analysis to assigning descriptors. Caption: *Figure 1.1 The process of indexing in information retrieval* Sample AI prompt: "Generate a diagram showing the process of indexing, from document analysis to assigning descriptors." Search string: "library indexing process descriptors information retrieval OER diagram"

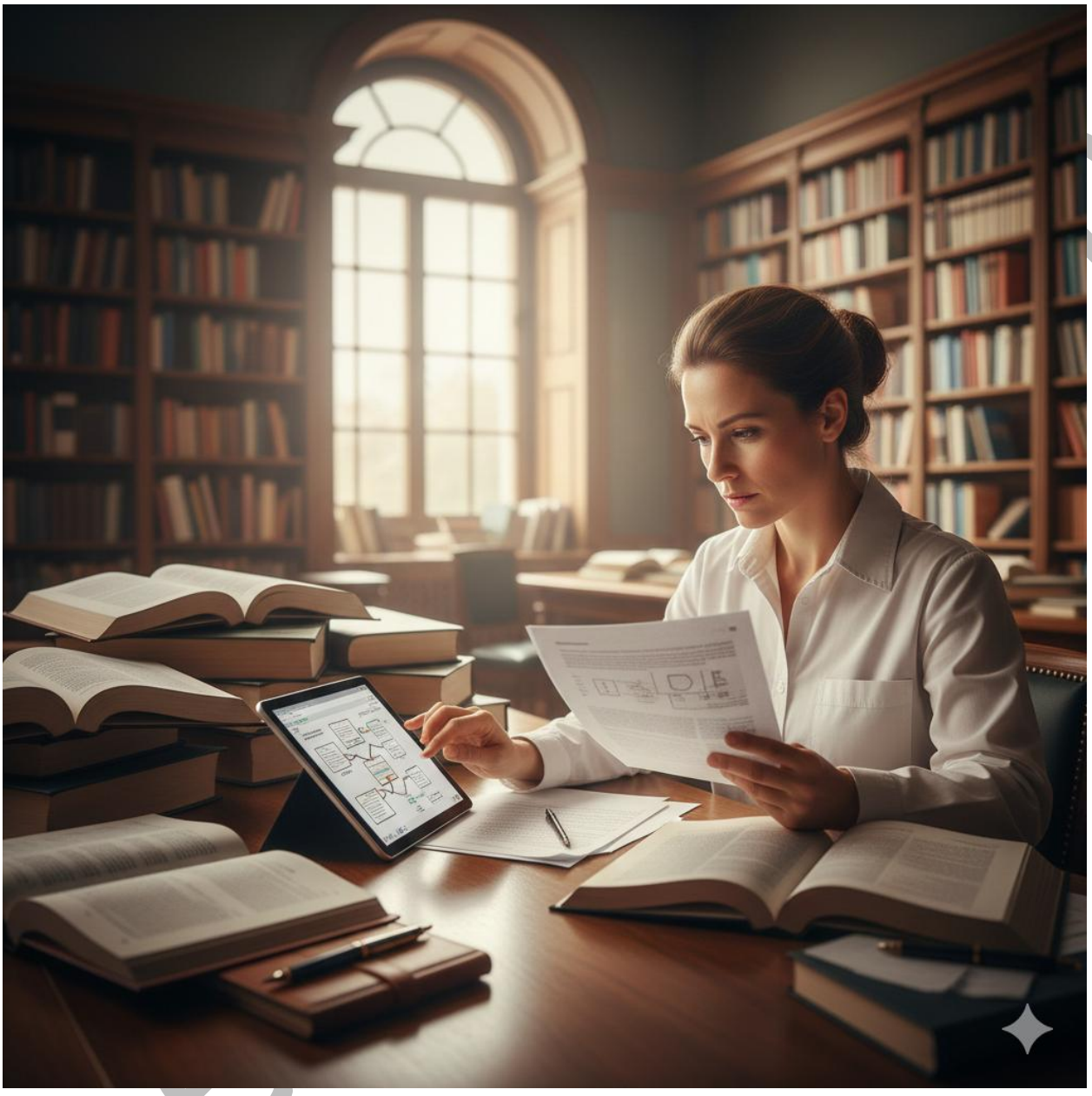
1.1.2 Definition of abstracting

Abstracting is the process of preparing a concise summary of a document that highlights its main ideas, scope, and conclusions. Abstracts help users decide whether a resource is relevant to their needs without reading the entire text. Abstracting can be informative, providing detailed coverage of content, or indicative, offering only a brief overview.

Fill in the blank:

- Abstracting is the process of preparing a concise _____ of a document that highlights its main ideas.

lanetonline.com

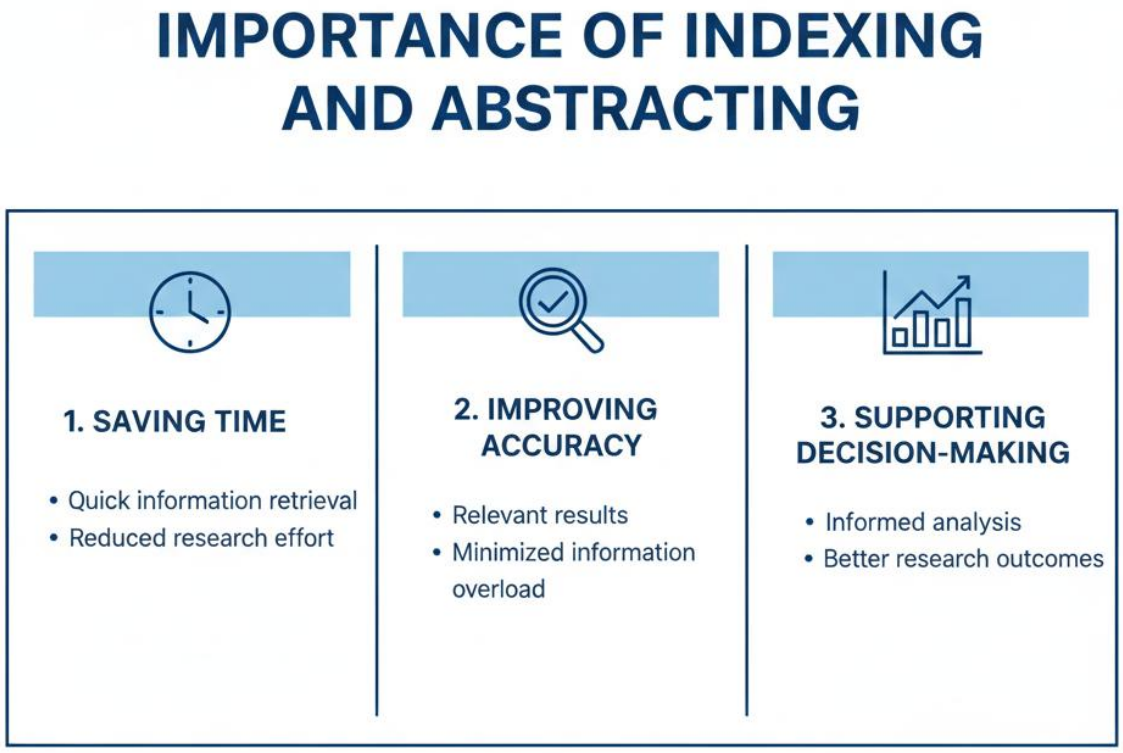


1.1.3 Importance of indexing and abstracting in information services

Indexing and abstracting are essential because they enhance **information retrieval**, which is the process of finding relevant information from a large collection. Without these tools, users would struggle to navigate vast amounts of data. Indexes provide structured access points, while abstracts offer quick insights into the relevance of documents. Together, they save time, improve accuracy, and support effective decision-making in research and learning.

Fill in the blank:

- Indexing and abstracting enhance _____ retrieval by providing structured access points and concise summaries.



Box 1.1 Importance of indexing and abstracting in information services

Pilot questions 1.1

1. What is indexing?
2. What is abstracting?
3. Why are indexing and abstracting important in information services?
4. Name one type of abstract.
5. What do indexes provide to users?

1.2 Basic Concepts and Terminology

In order to work effectively with indexing and abstracting, it is important to become familiar with the basic concepts and terminology used in the field. These terms provide the foundation for

understanding how information is organised, described, and retrieved. In this Part, we will look at key terms in indexing, key terms in abstracting, and then clarify the distinction between the two processes.

1.2.1 Key terms in indexing

Index is a systematic list of terms or subjects that point to the location of information within a document or collection. It acts as a map, guiding users to relevant content.

Descriptor is a word or phrase chosen to represent the subject content of a document. Descriptors are often drawn from a controlled vocabulary to ensure consistency.

Keyword is a significant word taken directly from the text of a document, used to indicate its subject matter. Unlike descriptors, keywords may not be controlled, which can lead to variations in retrieval.

Fill in the blank:

- A _____ is a word or phrase chosen to represent the subject content of a document.

lanetonline.com

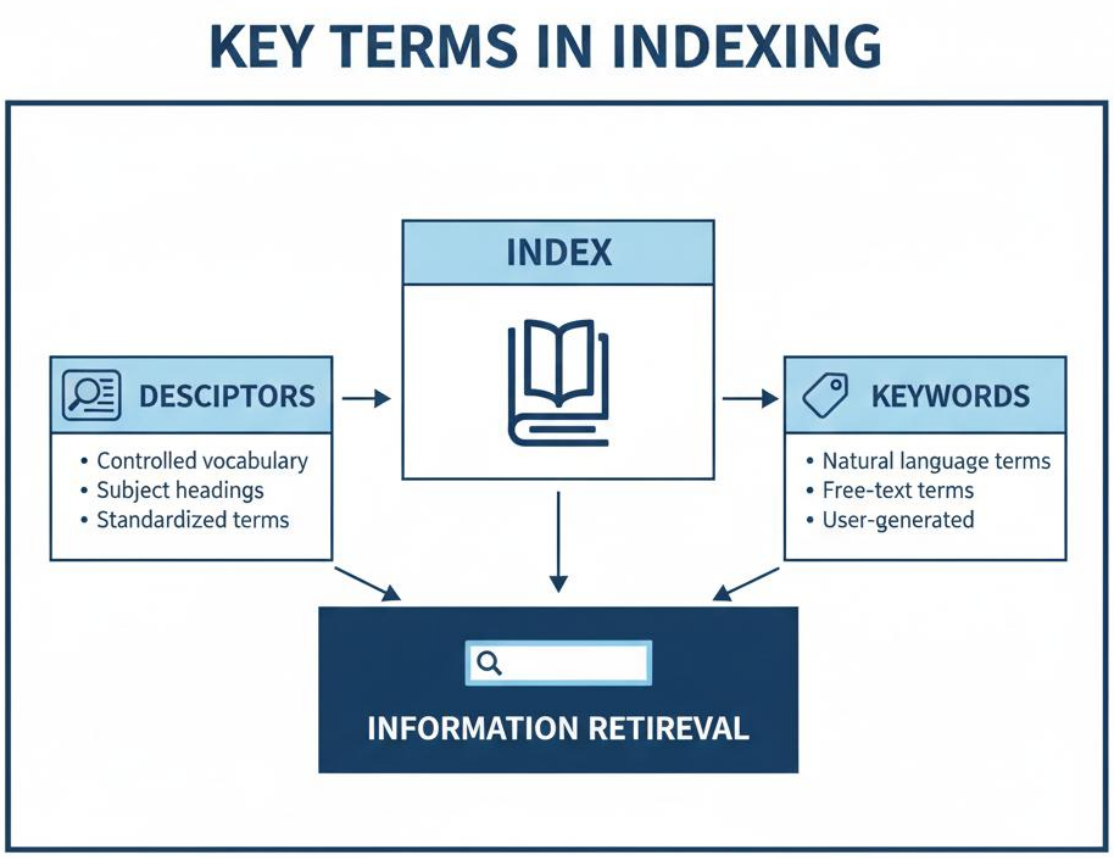


Figure 1.2 Key terms in indexing

1.2.2 Key terms in abstracting

Abstract is a concise summary of a document that highlights its main ideas, scope, and conclusions. It helps users decide whether the document is relevant to their needs.

Summary is a shorter version of a text that condenses its content, often used interchangeably with abstract, though summaries may be less formal.

Annotation is a brief note that describes or comments on a document, often providing evaluative or explanatory information.

Fill in the blank:

- An _____ is a brief note that describes or comments on a document.

Plate 1.2 Key terms in abstracting

1.2.3 Distinction between indexing and abstracting

While indexing and abstracting are closely related, they serve different purposes. Indexing provides access points by listing terms that represent the subject of a document, whereas abstracting offers a summary that conveys the essence of the document's content. Indexes guide users to where information can be found, while abstracts help users decide whether the information is worth consulting.

Fill in the blank:

- Indexing provides access points, while abstracting provides a _____ of the document's content.

DISTINCTION BETWEEN INTWEEN INDEXING AND ABSTRACTING

Feature	Indexing	Abstracting
- Quick information retrieval	- Quick information retrieval	- Content summary & evaluation
Method	- Keywords/Subject terms extraction, controlled vocabulary	- Condentation of main main points, critical analysis
Output	- List of keywords, subject headings	- Summary pargrgrah, indicative/informative abstract

Box 1.2 Distinction between indexing and abstracting

Pilot questions 1.2

1. What is an index?
2. Define a descriptor.
3. What is the purpose of an abstract?
4. Give one example of an annotation.
5. How does indexing differ from abstracting?

1.3 Historical Development and Scope

Indexing and abstracting have a long history that reflects the growth of knowledge and the need to organise it for effective use. Understanding their development helps you appreciate how these processes have evolved and why they remain central to modern information services. In this Part, we will trace early practices, examine their evolution in print and electronic formats, and consider their scope and application today.

1.3.1 Early practices of indexing and abstracting

In ancient times, scholars and scribes created rudimentary indexes to organise scrolls and manuscripts. These early efforts were often simple lists of subjects or names, designed to help readers locate information quickly. Abstracting also appeared in early scholarly traditions, where summaries of philosophical or religious texts were prepared to aid teaching and discussion.

Fill in the blank:

- Early indexes were often simple lists of _____ or names designed to help readers locate information.

lanetonline.com

DISTINCTION BETWEEN INTWEEN INDEXING AND ABSTRACTING

Feature	Indexing	Abstracting
- Quick information retrieval	- Quick information retrieval	- Content summary & evaluation
Method	- Keywords/Subject terms extraction, controlled vocabulary	- Condentation of main main points, critical analysis
Output	- List of keywords, subject headings	- Summary pargrgrah, indicative/informative abstract

Box 1.2 Distinction between indexing and abstracting

1.3.2 Evolution in print and electronic formats

With the invention of the printing press, indexing and abstracting became more formalised. Printed books included indexes at the back, and scholarly journals began to publish abstracts to summarise articles. In the twentieth century, specialised indexing and abstracting services emerged, covering disciplines such as medicine, engineering, and the social sciences. The digital age introduced electronic databases, automated indexing, and online abstracting services, making access faster and more comprehensive.

Fill in the blank:

- The invention of the _____ press made indexing and abstracting more formalised in printed books.

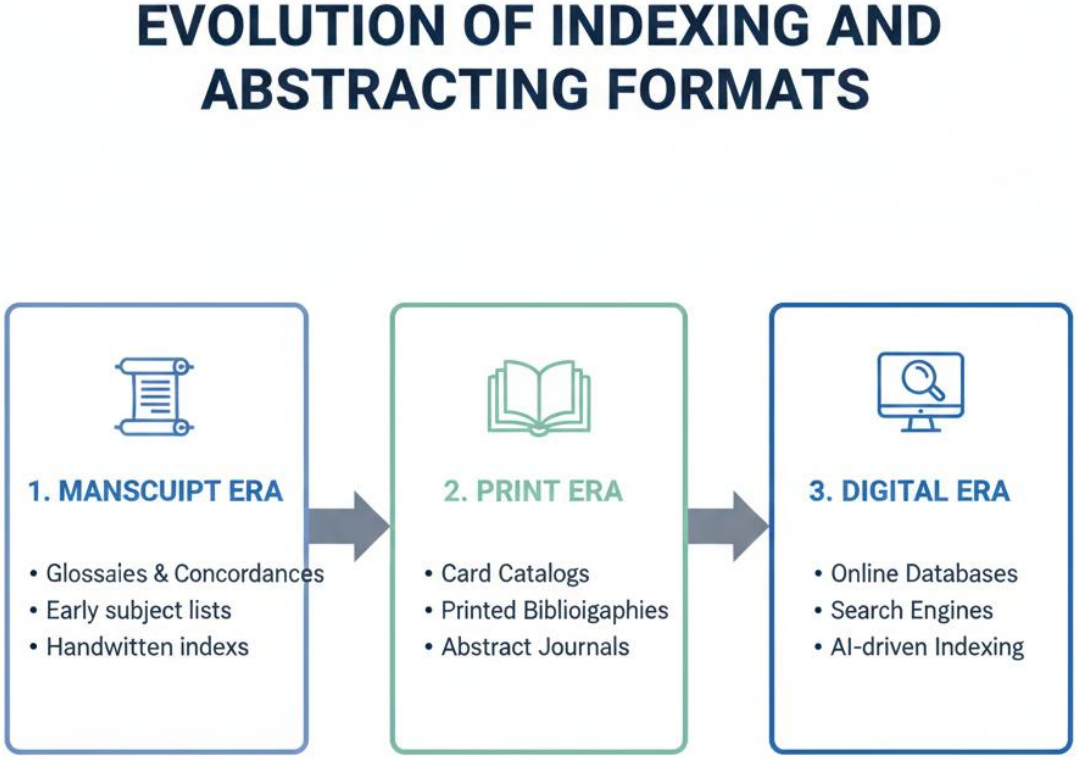


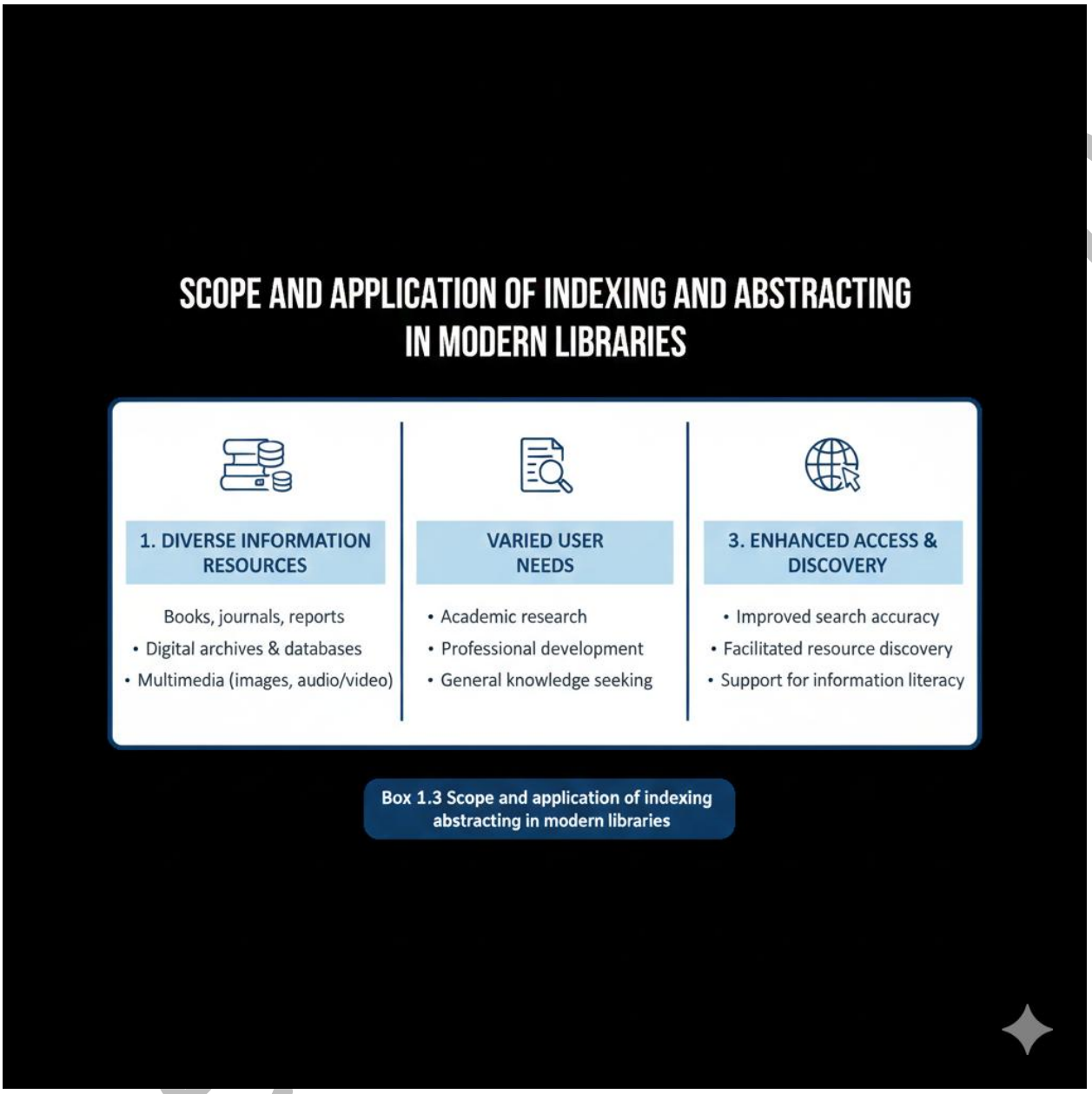
Figure 1.3 Evolution of indexing and Abstracting formats

1.3.3 Scope and application in modern libraries and information centres

Today, indexing and abstracting are applied across diverse fields, from academic libraries to commercial information services. They support research, teaching, and professional practice by ensuring that users can navigate vast collections of resources. The scope includes subject-specific databases, multidisciplinary repositories, and global networks that provide access to millions of documents. Abstracts and indexes are now integrated into search engines, making them indispensable tools for information retrieval in both print and digital environments.

Fill in the blank:

- Abstracts and indexes are now integrated into _____ engines, making them indispensable tools for information retrieval.



Box 1.3 Scope and application of indexing abstracting in modern libraries

Pilot questions 1.3

1. What were early indexes designed to do?
2. How did the printing press influence indexing and abstracting?
3. Name one specialised indexing or abstracting service that emerged in the twentieth century.
4. Where are abstracts and indexes integrated today?
5. Why are indexing and abstracting indispensable in modern libraries?

1.4 Principles and Functions

Indexing and abstracting are guided by certain principles that ensure consistency, accuracy, and usefulness. These principles shape how information is organised and presented, while their functions highlight the practical roles they play in supporting information retrieval. In this Part, we will look at the principles of indexing, the principles of abstracting, and the functions of indexes and abstracts.

1.4.1 Principles guiding indexing

Principles of indexing refer to the rules and standards that ensure indexes are reliable and effective. These include consistency in the use of terms, accuracy in representing the subject matter, and clarity in the arrangement of entries. Indexers must also avoid bias and ensure that the index reflects the document's content fairly.

Fill in the blank:

- One principle of indexing is _____ in the use of terms to ensure reliability.

lanetonline.com

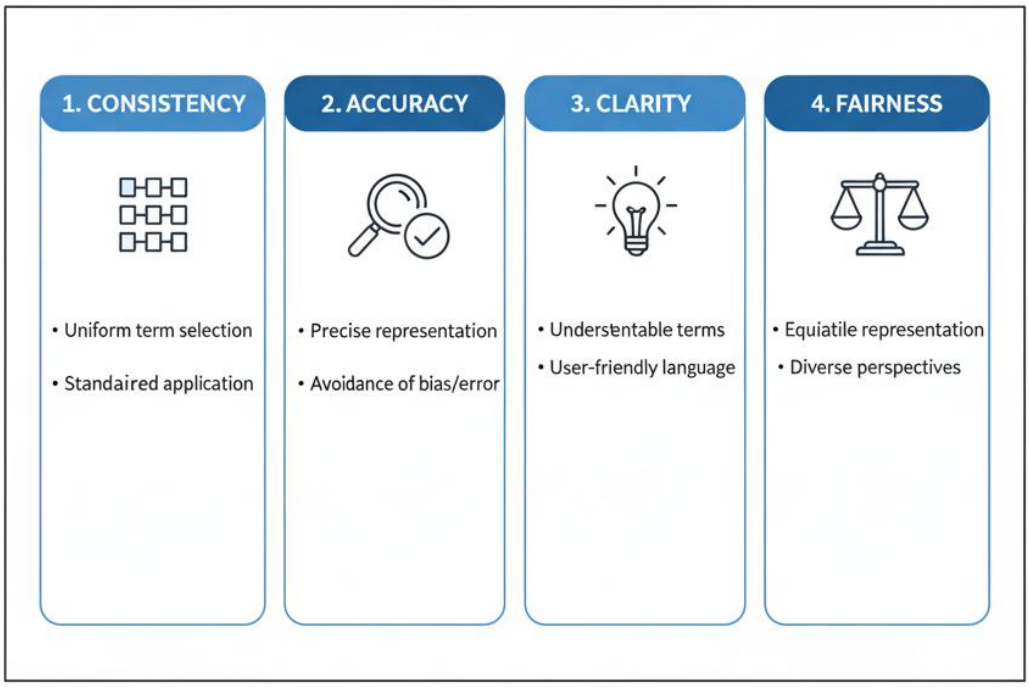


Figure 1.4
Principles guiding indexing

1.4.2 Principles guiding abstracting

Principles of abstracting ensure that summaries are concise, accurate, and representative of the document's content. Abstracts should avoid personal opinions, unnecessary detail, and misleading information. They must highlight the main ideas, scope, and conclusions, while remaining neutral and objective.

Fill in the blank:

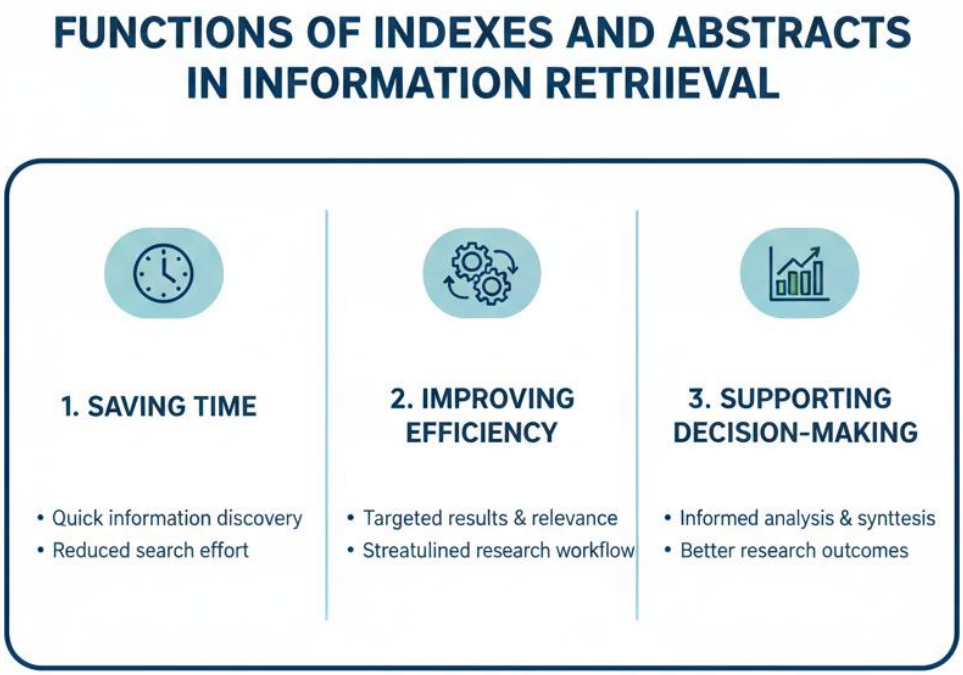
- Abstracts must avoid personal _____ and unnecessary detail to remain objective.

1.4.3 Functions of indexes and abstracts in information retrieval

Functions of indexes and abstracts describe their practical roles in helping users access information. Indexes provide structured access points, making it easier to locate specific topics within large collections. Abstracts allow users to quickly assess the relevance of a document without reading it in full. Together, they save time, improve efficiency, and support effective decision-making in research and learning.

Fill in the blank:

- Indexes provide structured _____ points, while abstracts allow users to assess relevance quickly.



Box 1.4 Functions of indexs and abstracts in information retrïieval

Pilot questions 1.4

1. Name one principle of indexing.
2. What should abstracts avoid to remain objective?
3. What do indexes provide to users?
4. Why are abstracts useful in information retrieval?
5. How do indexes and abstracts support decision-making?

Series Summary

This Series has introduced you to the foundational aspects of indexing and abstracting, showing how these processes underpin effective information retrieval. We began by defining indexing

and abstracting, highlighting their importance in information services. Then we explored key concepts and terminology, clarifying descriptors, keywords, abstracts, summaries, and annotations, and distinguishing between indexing and abstracting. Following that, we traced their historical development, from early manuscript practices through print formats to electronic databases, and finally considered their scope in modern libraries. We concluded with the principles and functions that guide these processes, emphasising their role in ensuring consistency, accuracy, and efficiency.

By completing this Series, you should now be able to define indexing and abstracting, explain their importance, identify and describe key terms, distinguish between the two processes, analyse their historical development and scope, and explain the principles and functions that guide them. These achievements directly align with the Series Learning Outcomes, giving you a solid foundation for progressing to the next Series on methods and techniques of indexing and abstracting.

Glossary of Terms

Abstract A concise summary of a document that highlights its main ideas, scope, and conclusions, helping users decide whether the document is relevant to their needs.

Annotation A brief note that describes or comments on a document, often providing evaluative or explanatory information.

Descriptor A word or phrase chosen to represent the subject content of a document, usually taken from a controlled vocabulary to ensure consistency.

Index A systematic list of terms or subjects that point to the location of information within a document or collection, acting as a guide for users.

Indexing The process of creating an organised list of descriptors or keywords that represent the content of a document, enabling efficient information retrieval.

Information retrieval The process of finding relevant information from a large collection of resources, often supported by tools such as indexes and abstracts.

Keyword A significant word taken directly from the text of a document, used to indicate its subject matter. Unlike descriptors, keywords may not be controlled.

Summary A shorter version of a text that condenses its content. It is similar to an abstract but may be less formal or detailed.

Concept Check Questions [Series 1]

Objective Questions

1. Define indexing. *(Linked to SLO 1.1)*
2. Define abstracting. *(Linked to SLO 1.1)*
3. Identify one key term used in indexing. *(Linked to SLO 1.3)*
4. Select the correct principle of abstracting: neutrality, bias, or opinion. *(Linked to SLO 1.6)*

lanetonline.com

5. Indexes provide structured _____ points for information retrieval. *(Linked to SLO 1.6)*

Short-Answer Questions

6. Explain why indexing is important in information services. *(Linked to SLO 1.2)*

7. Describe the difference between a keyword and a descriptor. *(Linked to SLO 1.3)*

8. Summarise one way the printing press influenced indexing and abstracting. *(Linked to SLO 1.5)*

9. State one principle guiding indexing. *(Linked to SLO 1.6)*

10. Give one function of abstracts in information retrieval. *(Linked to SLO 1.6)*

Long-Answer Questions

11. Analyse the distinction between indexing and abstracting in terms of purpose and application. *(Linked to SLO 1.4)*

12. Evaluate the historical development of indexing and abstracting and its impact on modern information services. *(Linked to SLO 1.5)*

13. Assess the functions of indexes and abstracts in supporting effective decision-making. *(Linked to SLO 1.6)*

Answers to Concept Check Questions [Series 1]

Objective Questions

1. Indexing is the process of creating an organised list of descriptors or keywords that represent the content of a document.
2. Abstracting is the process of preparing a concise summary of a document that highlights its main ideas, scope, and conclusions.
3. Descriptor.
4. Neutrality.
5. Access.

Short-Answer Questions

6. Indexing is important because it provides structured access points that help users locate information quickly.

7. A keyword is taken directly from the text of a document, while a descriptor is chosen from a controlled vocabulary to ensure consistency.

8. The printing press formalised indexing and abstracting by including indexes in books and abstracts in journals.

9. Consistency in the use of terms.

laetonline.com

10. Abstracts allow users to quickly assess the relevance of a document without reading it in full.

Long-Answer Questions

11. *Basic response:* Indexing provides access points by listing terms that represent the subject of a document, while abstracting offers a summary that conveys the essence of the document's content. *Value-added response:* Indexing guides users to where information can be found, whereas abstracting helps them decide whether the information is worth consulting. Together, they complement each other in enhancing retrieval efficiency.

12. *Basic response:* Indexing and abstracting evolved from simple lists in manuscripts to formalised practices in print and electronic formats. *Value-added response:* Their historical development reflects the growth of knowledge organisation, with the printing press and later digital technologies expanding their scope. Today, they underpin global databases and search engines, making them indispensable in modern information services.

13. *Basic response:* Indexes provide structured access points, and abstracts allow users to assess relevance quickly. *Value-added response:* Beyond saving time and improving efficiency, indexes and abstracts support critical decision-making in research, teaching, and professional practice by ensuring that users can navigate vast collections effectively and select the most relevant resources.

Answers to Pilot Questions [Series 1]

Part 1.1 Introduction to Indexing and Abstracting

- Indexing is the process of creating an organised list of descriptors or keywords that represent the content of a document.
- Abstracting is the process of preparing a concise summary of a document that highlights its main ideas, scope, and conclusions.
- Indexing and abstracting are important because they enhance information retrieval by providing structured access points and concise summaries.
- One type of abstract is an informative abstract.
- Indexes provide structured access points to users.

Part 1.2 Basic Concepts and Terminology

- An index is a systematic list of terms or subjects that point to the location of information within a document or collection.
- A descriptor is a word or phrase chosen to represent the subject content of a document, usually taken from a controlled vocabulary.
- The purpose of an abstract is to provide a concise summary that helps users decide whether a document is relevant.
- An annotation is a brief note that describes or comments on a document.

laenonline.com

- Indexing differs from abstracting because indexing provides access points, while abstracting provides a summary of the document's content.

Part 1.3 Historical Development and Scope

- Early indexes were designed to help readers locate information quickly.
- The printing press influenced indexing and abstracting by formalising their inclusion in books and journals.
- One specialised indexing or abstracting service that emerged in the twentieth century is *Index Medicus*.
- Abstracts and indexes are integrated today into search engines.
- Indexing and abstracting are indispensable in modern libraries because they support efficient information retrieval and decision-making.

Part 1.4 Principles and Functions

- One principle of indexing is consistency in the use of terms.
- Abstracts should avoid personal opinions to remain objective.
- Indexes provide structured access points to users.
- Abstracts are useful because they allow users to quickly assess the relevance of a document.
- Indexes and abstracts support decision-making by saving time, improving efficiency, and guiding users to relevant information.

References and Attributions [Series 1]

General References

- Lancaster, F. W. (2003). *Indexing and abstracting in theory and practice* (3rd ed.). London: Facet Publishing.
- Rowley, J., & Hartley, R. (2008). *Organising knowledge: An introduction to managing access to information* (4th ed.). Aldershot: Ashgate.
- Svenonius, E. (2000). *The intellectual foundation of information organisation*. Cambridge, MA: MIT Press.
- International Federation of Library Associations and Institutions (IFLA). (2017). *Guidelines for subject access in national bibliographies*. The Hague: IFLA.

Illustrations

Part 1.1 Introduction to Indexing and Abstracting

- *Figure 1.1 The process of indexing in information retrieval*: AI-generated using prompt "Generate a diagram showing the process of indexing, from document analysis to assigning descriptors." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "library indexing process descriptors information retrieval diagram OER."

lanetonline.com

- *Plate 1.1 Abstracting in practice*: AI-generated using prompt “Generate an image showing a researcher reading a document and preparing a summary.” Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: “library abstracting process summary researcher OER image.”
- *Box 1.1 Importance of indexing and abstracting in information services*: AI-generated using prompt “Generate a text box summarising the importance of indexing and abstracting, including saving time, improving accuracy, and supporting decision-making.” Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: “importance indexing abstracting information retrieval OER.”

Part 1.2 Basic Concepts and Terminology

- *Figure 1.2 Key terms in indexing*: AI-generated using prompt “Generate a diagram showing the relationship between an index, descriptors, and keywords in information retrieval.” Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: “library indexing descriptors keywords OER diagram.”
- *Plate 1.2 Key terms in abstracting*: AI-generated using prompt “Generate an image showing a student writing annotations in the margin of a research article.” Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: “library abstracting annotation summary abstract OER image.”
- *Box 1.2 Distinction between indexing and abstracting*: AI-generated using prompt “Generate a text box summarising the differences between indexing and abstracting, including purpose, method, and output.” Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: “difference indexing abstracting purpose method output OER.”

Part 1.3 Historical Development and Scope

- *Plate 1.3 Early practices of indexing and abstracting*: AI-generated using prompt “Generate an image showing ancient manuscripts with marginal notes serving as early indexes.” Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: “ancient manuscripts early indexing abstracting OER image.”
- *Figure 1.3 Evolution of indexing and abstracting formats*: AI-generated using prompt “Generate a diagram showing the evolution of indexing and abstracting from manuscripts to print to electronic formats.” Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: “evolution indexing abstracting manuscripts print electronic OER diagram.”
- *Box 1.3 Scope and application of indexing and abstracting in modern libraries*: AI-generated using prompt “Generate a text box summarising the scope and application of indexing and abstracting in modern libraries and information centres.” Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: “scope application indexing abstracting modern libraries information centres OER.”

Part 1.4 Principles and Functions

lanetonline.com

- *Figure 1.4 Principles guiding indexing*: AI-generated using prompt “Generate a diagram showing principles of indexing such as consistency, accuracy, clarity, and fairness.” Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: “principles indexing consistency accuracy clarity fairness OER diagram.”
- *Plate 1.4 Principles guiding abstracting*: AI-generated using prompt “Generate an image showing a librarian preparing an abstract by highlighting main ideas in a document.” Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: “principles abstracting concise accurate objective summary OER image.”
- *Box 1.4 Functions of indexes and abstracts in information retrieval*: AI-generated using prompt “Generate a text box summarising the functions of indexes and abstracts, including saving time, improving efficiency, and supporting decision-making.” Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: “functions indexes abstracts information retrieval efficiency decision making OER.”

- **Course code: LIS 413**
- **Course title: Indexing and Abstracting**
- **Course unit load: 2 Units**
- **Series list:**

1. Series 1: Basic Concepts of Indexing and Abstracting
2. Series 2: Methods and Techniques of Indexing and Abstracting
3. Series 3: Thesaurus Design and Updating
4. Series 4: Types of Indexes and Abstracts
5. Series 5: Indexing and Abstracting Services and Evaluation

Series 2: Methods and Techniques of Indexing and Abstracting

- **Part 2.1 Methods of Indexing**
    - 2.1.1 Manual indexing
    - 2.1.2 Automated indexing
    - 2.1.3 Controlled vocabulary versus free indexing
- **Part 2.2 Techniques of Abstracting**
    - 2.2.1 Informative abstracts
    - 2.2.2 Indicative abstracts
    - 2.2.3 Structured abstracts
- **Part 2.3 Tools and Standards in Indexing and Abstracting**

lanetonline.com

    - 2.3.1 Use of thesauri and classification schemes
    - 2.3.2 International standards and guidelines
    - 2.3.3 Software tools for indexing and abstracting
- **Part 2.4 Practical Applications**
    - 2.4.1 Indexing in library catalogues
    - 2.4.2 Abstracting in scholarly journals
    - 2.4.3 Integration into electronic databases

Introduction

When you search for information in a library catalogue or an electronic database, the ease with which you find relevant materials depends largely on the methods and techniques used in indexing and abstracting. These processes determine how information is organised, described, and presented, making them vital for effective retrieval. This Series builds on the foundational concepts you studied earlier, guiding you into the practical approaches that professionals use to carry out indexing and abstracting.

The aim of this Series is to equip you with knowledge of the different methods and techniques of indexing and abstracting, and to help you apply appropriate tools and standards in practical contexts. By the end, you will be able to evaluate and use these methods effectively in both print and electronic environments.

We shall commence this Series by examining the methods of indexing, including manual and automated approaches, as well as the use of controlled vocabulary versus free indexing. Next, we will move on to techniques of abstracting, where we will consider informative, indicative, and structured abstracts. Following that, we will explore tools and standards, including thesauri, classification schemes, international guidelines, and software applications. Finally, we will conclude with practical applications, showing how indexing and abstracting are integrated into library catalogues, scholarly journals, and electronic databases.

Upon completing this Series, you should be able to:

- **SLO 2.1** describe the methods of indexing, including manual and automated approaches,
- **SLO 2.2** distinguish between controlled vocabulary indexing and free indexing,
- **SLO 2.3** explain the techniques of abstracting, including informative, indicative, and structured abstracts,
- **SLO 2.4** apply appropriate tools such as thesauri, classification schemes, and software in indexing and abstracting,
- **SLO 2.5** evaluate the role of international standards and guidelines in ensuring consistency and quality, and
- **SLO 2.6** demonstrate practical applications of indexing and abstracting in catalogues, journals, and electronic databases.

2.1 Methods of Indexing

laonline.com

Indexing is central to organising information for retrieval. Different methods have been developed to suit various contexts, ranging from traditional manual approaches to modern automated systems. In this Part, we will explore manual indexing, automated indexing, and the distinction between controlled vocabulary and free indexing.

2.1.1 Manual indexing

Manual indexing is the process where a human indexer reads or analyses a document and selects appropriate descriptors or keywords to represent its content. This method relies on the expertise of the indexer, who ensures accuracy, relevance, and consistency. Manual indexing is often used in specialised fields where subject knowledge is critical.

Fill in the blank:

- Manual indexing relies on the expertise of the _____ to ensure accuracy and relevance.

lanetonline.com

2.1.2 Automated indexing

Automated indexing uses computer algorithms to analyse documents and assign descriptors or keywords. This method is faster and more scalable than manual indexing, especially for large collections. However, it may lack the nuanced understanding of human indexers, sometimes leading to errors or inconsistencies. Automated indexing is widely used in electronic databases and search engines.

Fill in the blank:

- Automated indexing uses _____ algorithms to analyse documents and assign descriptors.

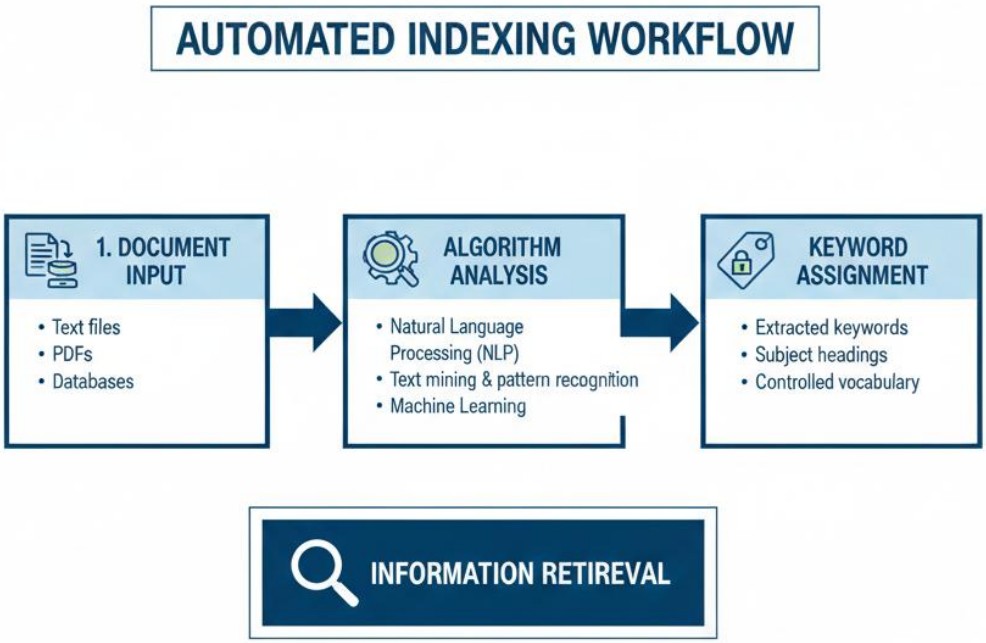


Figure 2.1 Automated indexing workflow

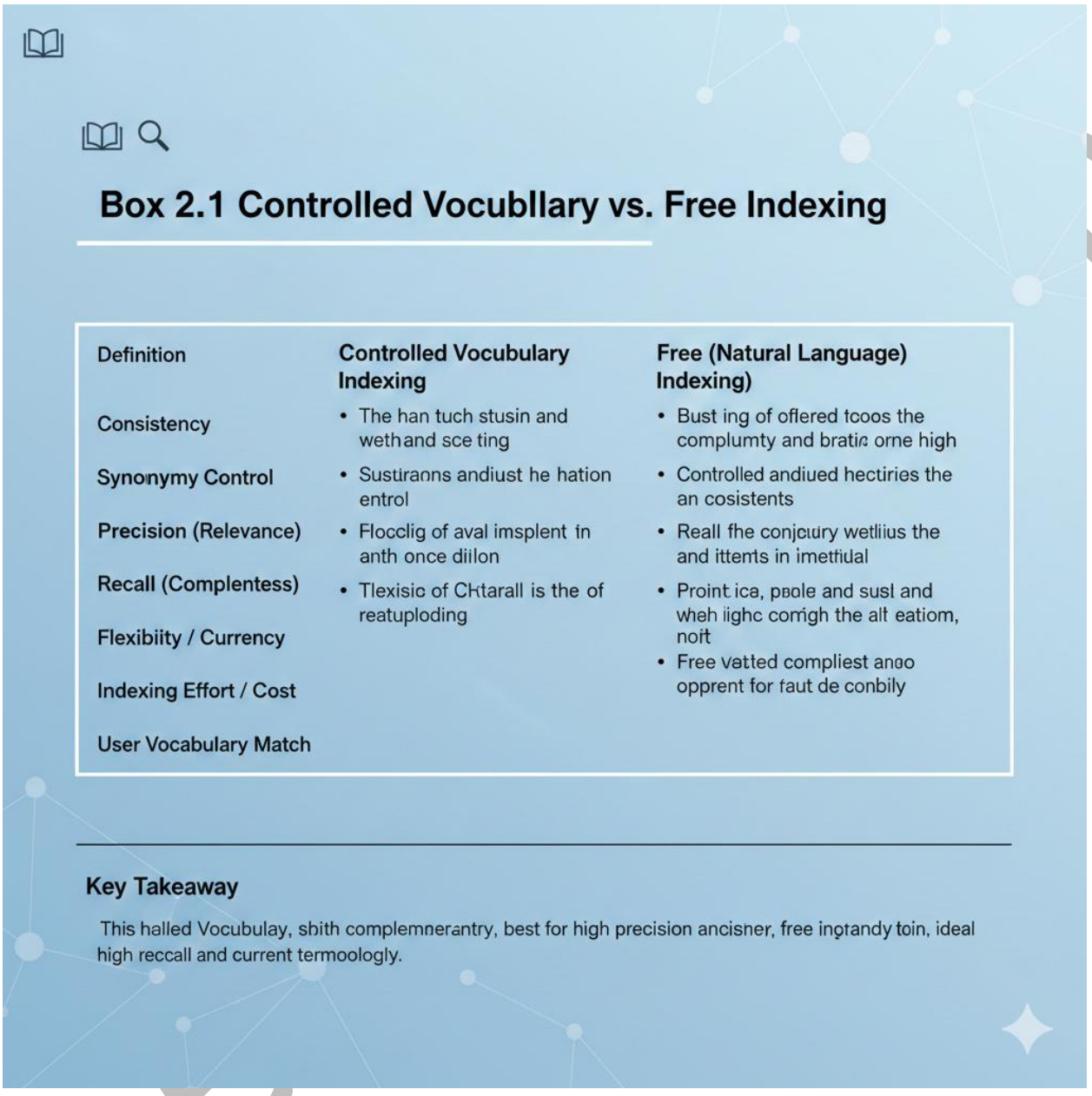
2.1.3 Controlled vocabulary versus free indexing

Controlled vocabulary indexing involves using a predefined list of authorised terms, such as a thesaurus or subject heading list, to describe documents. This ensures consistency and improves retrieval accuracy.

Free indexing allows indexers or algorithms to select any words from the document as descriptors, without relying on a controlled list. While flexible, it can lead to variations in terminology and reduced precision.

Fill in the blank:

- Controlled vocabulary indexing ensures _____ by using authorised terms from a thesaurus or subject heading list.



Box 2.1 Controlled Vocubllary vs. Free Indexing

Definition	Controlled Vocubulary Indexing	Free (Natural Language) Indexing)
Consistency	• The han tuch stusin and weth and sce ting	• Bust ing of oflered tcoos the complumty and bratic orne high
Synonymy Control	• Sustiranns andiust he hation entrol	• Controlled andiued hectiries the an cosistents
Precision (Relevance)	• Flocclig of aval imsplent in anth once diilon	• Reall fhe conjcuury wetliius the and ittents in imettiual
Recall (Complentess)	• Tlexisic of Chtarall is the of reatuploding	• Proint ica, pɒole and susl and wheh iighc comigh the alt eatiom, noit
Flexibiity / Currency		• Free vatted compliest anɑo opprent for faut de conbily
Indexing Effort / Cost		
User Vocabulary Match		

Key Takeaway

This halled Vocubulay, sbith complemnerantry, best for high precision ancisner, free inotandy toin, ideal high reccall and current termoologly.

Pilot questions 2.1

1. What is manual indexing?
2. What is automated indexing?
3. What does controlled vocabulary indexing use?
4. State one advantage of manual indexing.
5. Give one limitation of free indexing.

2.2 Techniques of Abstracting

Abstracting is a vital process that condenses the content of a document into a shorter form, enabling users to quickly determine its relevance. Different techniques are used depending on the

purpose, audience, and type of document. In this Part, we will explore informative abstracts, indicative abstracts, and structured abstracts.

2.2.1 Informative abstracts

Informative abstracts provide a detailed summary of a document, including its purpose, methodology, results, and conclusions. They are commonly used in scientific and technical writing, where readers need a clear understanding of the content without reading the full text.

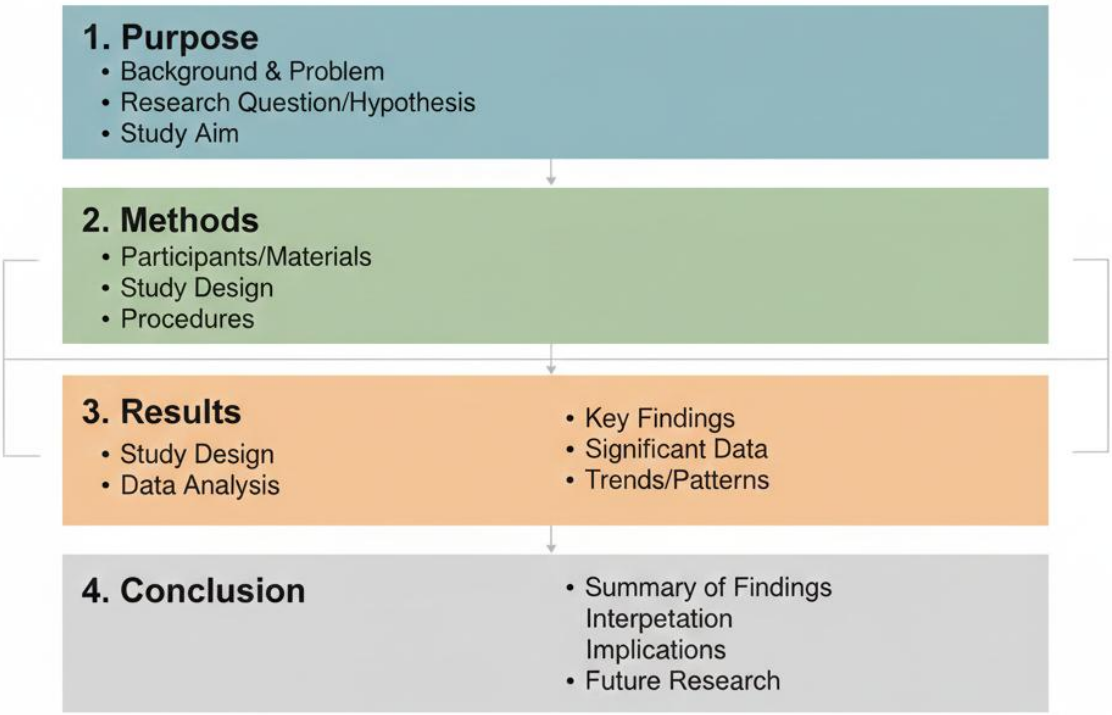
Fill in the blank:

- Informative abstracts provide a detailed _____ of a document, including its purpose, methodology, and conclusions.

lanetonline.com

Figure 2.2

Components of an Informative Abstract



2.2.2 Indicative abstracts

Indicative abstracts give only a brief overview of the document, highlighting its scope and general themes without going into detail. They are useful when readers need to know the type of information covered but do not require specifics. Indicative abstracts are often used in humanities and social sciences.

Fill in the blank:

- Indicative abstracts highlight the _____ and general themes of a document without detailed coverage.

2.2.3 Structured abstracts

Structured abstracts are organised into clearly labelled sections such as background, objectives, methods, results, and conclusions. They are widely used in medical and scientific journals to ensure clarity and uniformity. Structured abstracts help readers quickly locate specific information.

Fill in the blank:

- Structured abstracts are organised into clearly labelled _____ such as background, methods, and results.

[Insert box here] Caption: *Box 2.2 Example of a structured abstract format* Short description: Text box showing a sample structured abstract with headings: background, objectives, methods,

results, conclusions. Sample AI prompt: “Generate a text box showing a sample structured abstract with headings: background, objectives, methods, results, conclusions.” Search string: “structured abstract format medical journal OER example”

Pilot questions 2.2

1. What is an informative abstract?
2. What is an indicative abstract?
3. What type of abstract is commonly used in medical journals?
4. State one component of an informative abstract.
5. Why are structured abstracts useful?

2.3 Tools and Standards in Indexing and Abstracting

Indexing and abstracting rely on tools and standards to ensure consistency, accuracy, and quality. These resources guide professionals in selecting terms, organising information, and presenting summaries in ways that are universally understood. In this Part, we will examine thesauri and classification schemes, international standards and guidelines, and software tools that support indexing and abstracting.

2.3.1 Use of thesauri and classification schemes

A **thesaurus** in information science is a structured list of terms showing relationships such as synonyms, broader terms, and narrower terms. It helps indexers choose consistent descriptors and improves retrieval accuracy.

A **classification scheme** is a systematic arrangement of subjects into categories, often represented by numbers or codes, such as the Dewey Decimal Classification. These schemes provide a framework for organising information across collections.

Fill in the blank:

- A _____ shows relationships such as synonyms, broader terms, and narrower terms to guide indexers.

[Insert figure here] Short description: Diagram showing a thesaurus structure with broader, narrower, and related terms. Caption: *Figure 2.3 Thesaurus structure in indexing* Sample AI prompt: “Generate a diagram showing a thesaurus structure with broader, narrower, and related terms.” Search string: “thesaurus structure broader narrower related terms OER diagram”

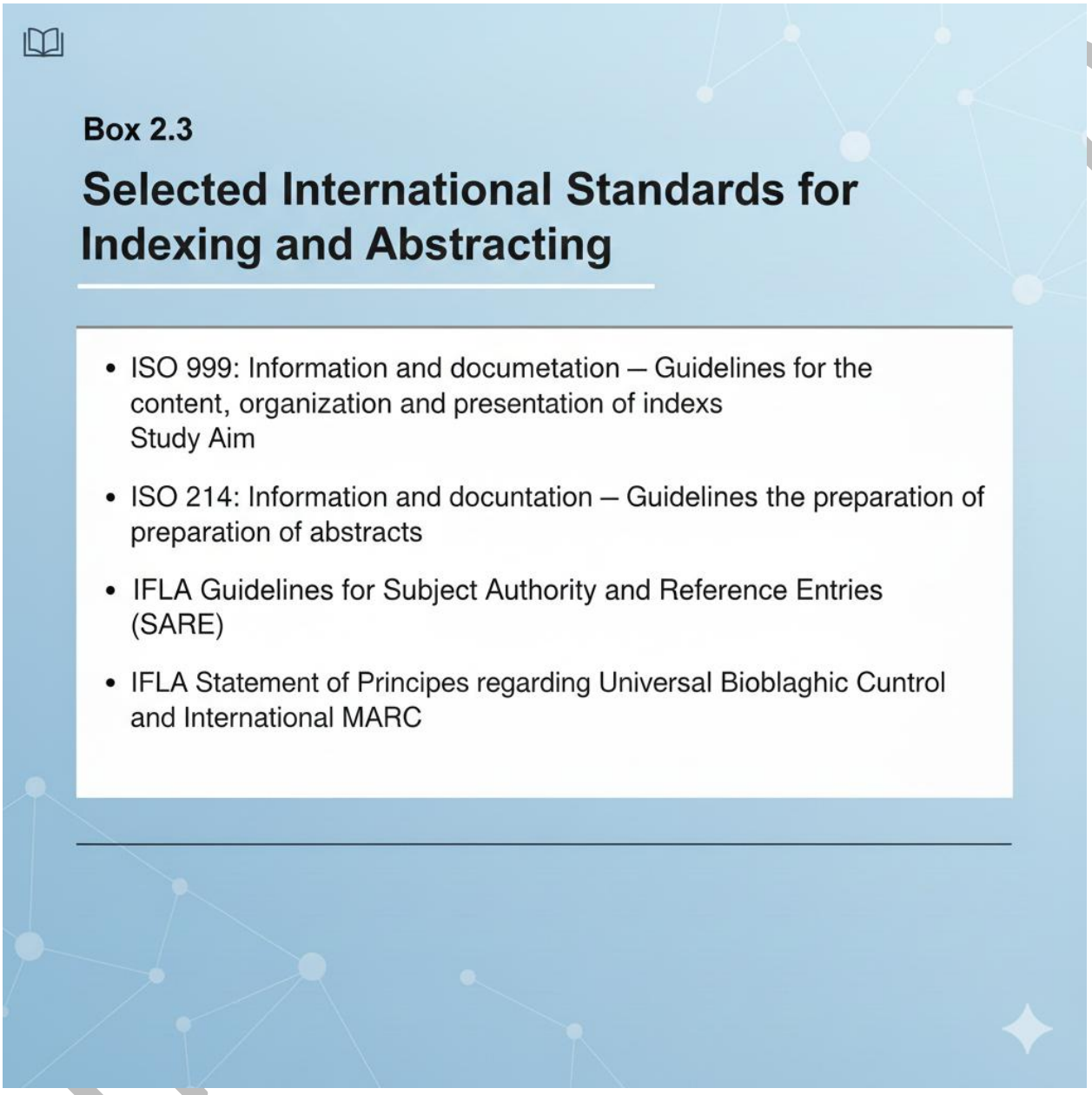
2.3.2 International standards and guidelines

International standards provide rules and recommendations that ensure indexing and abstracting practices are consistent across institutions and countries. For example, ISO 999 offers guidelines for the content, organisation, and presentation of indexes. Similarly, IFLA guidelines support subject access in bibliographies. These standards promote uniformity and improve the usability of information services globally.

Fill in the blank:

lanetonline.com

- ISO _____ provides guidelines for the content, organisation, and presentation of indexes.

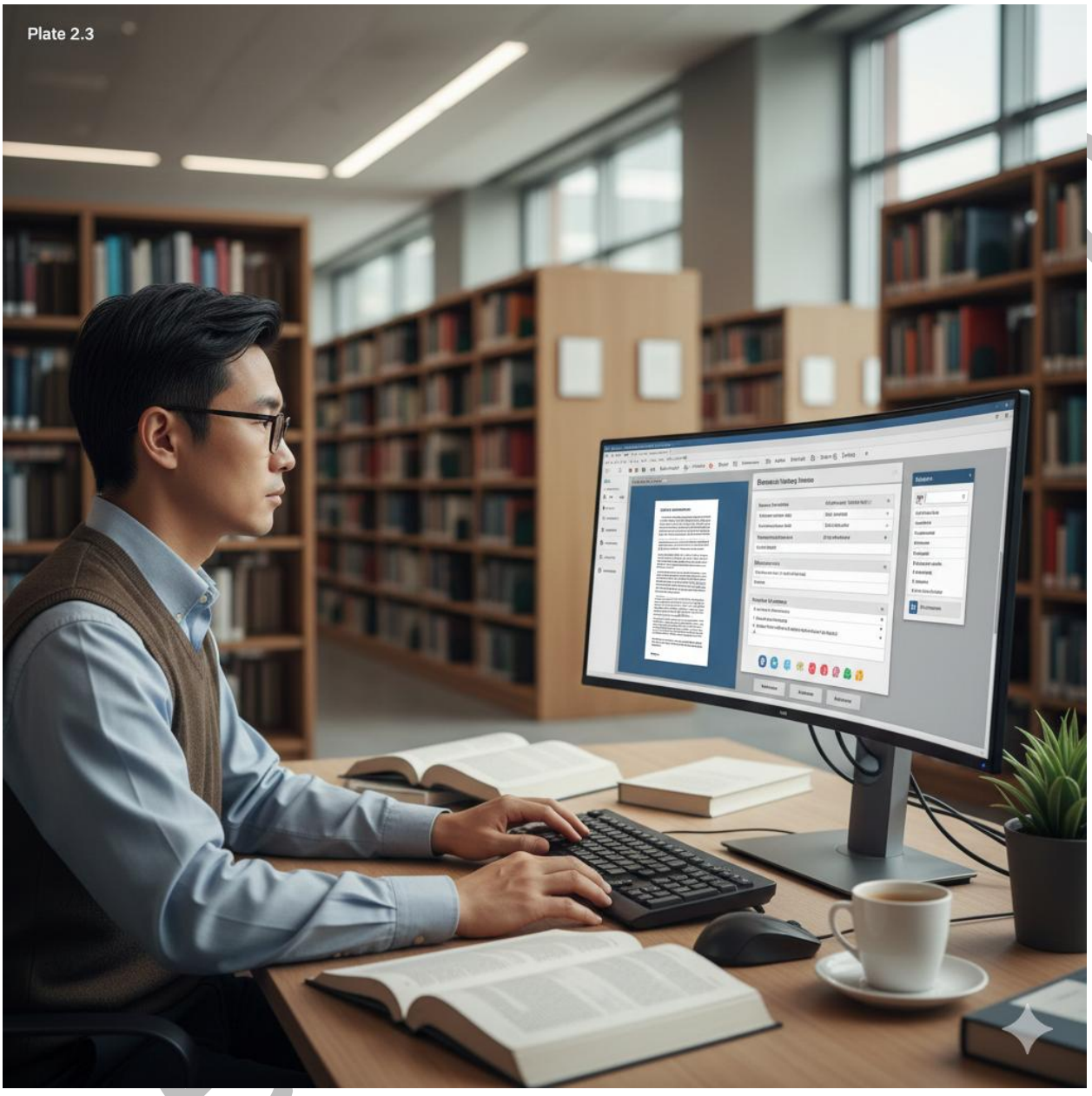


2.3.3 Software tools for indexing and abstracting

Software tools support indexing and abstracting by automating processes, managing controlled vocabularies, and integrating with databases. Examples include library management systems, citation databases, and specialised abstracting software. These tools improve efficiency, reduce errors, and allow large volumes of information to be processed quickly.

Fill in the blank:

- Software tools improve efficiency by automating processes and managing _____ vocabularies.



Pilot questions 2.3

1. What is a thesaurus in information science?
2. What is a classification scheme?
3. Which ISO standard provides guidelines for indexes?
4. Name one international organisation that issues guidelines for indexing and abstracting.
5. State one advantage of using software tools in indexing and abstracting.

2.4 Practical Applications

Indexing and abstracting are not just theoretical concepts; they are applied daily in libraries, scholarly communication, and electronic databases. Understanding these applications helps you

see how the methods and techniques studied earlier are put into practice to support research, teaching, and professional work.

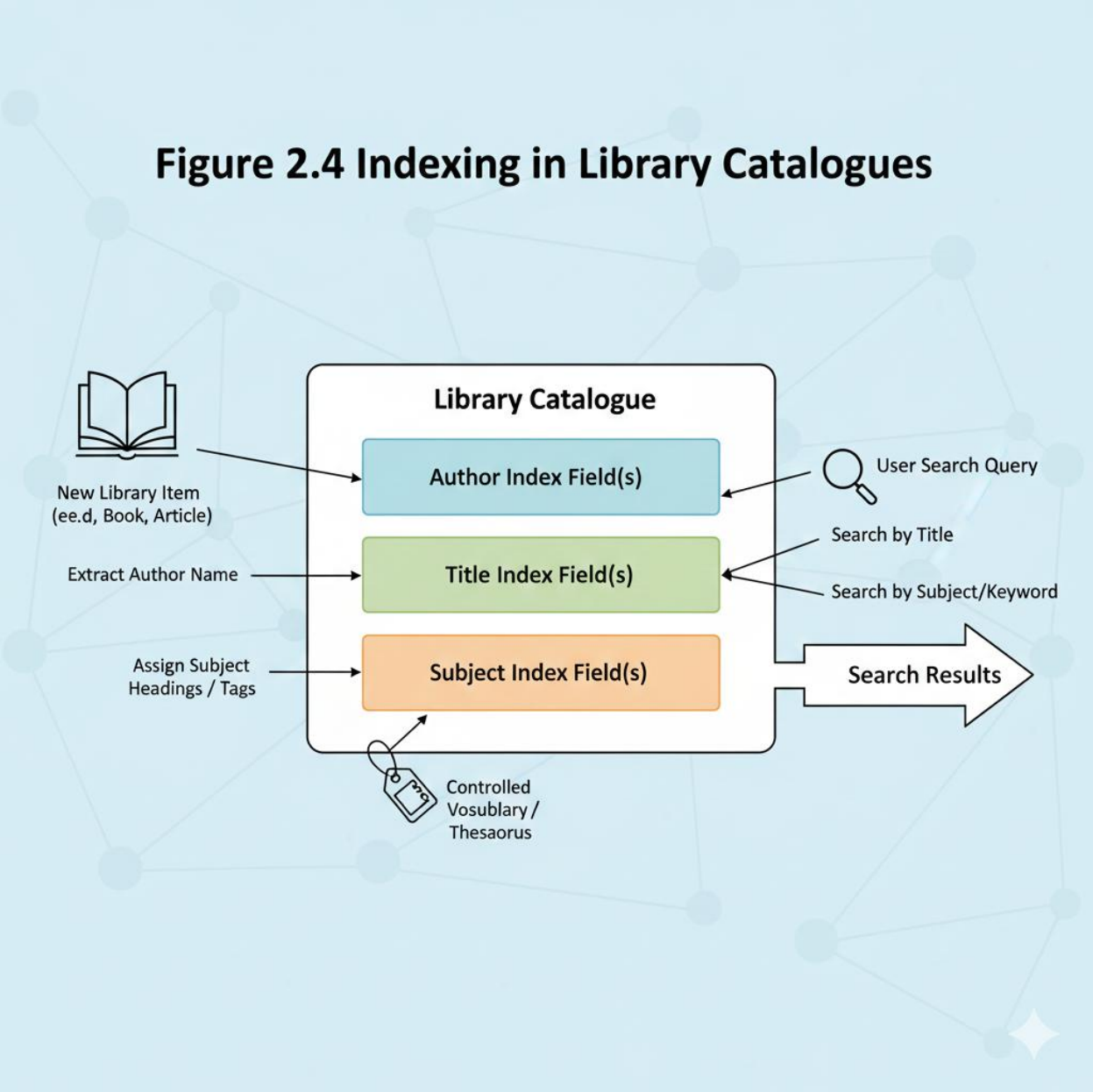
2.4.1 Indexing in library catalogues

Library catalogues use indexing to provide access points such as author, title, subject, and keywords. These indexes allow users to search collections efficiently and retrieve relevant materials. Controlled vocabularies, such as subject headings, are often employed to ensure consistency across catalogues.

Fill in the blank:

- Library catalogues use _____ to provide access points such as author, title, and subject.

lanetonline.com



2.4.2 Abstracting in scholarly journals

Scholarly journals use abstracts to summarise articles, enabling readers to quickly determine relevance. Abstracts are often required by publishers and are included in databases to improve discoverability. Structured abstracts are particularly common in medical and scientific journals, where clarity and uniformity are essential.

Fill in the blank:

- Scholarly journals use _____ to summarise articles and help readers determine relevance.

[Insert plate here] Short description: Image showing a researcher reading journal abstracts to decide which articles to consult. Caption: *Plate 2.4 Abstracting in scholarly journals* Sample AI

prompt: “Generate an image showing a researcher reading journal abstracts to decide which articles to consult.” Search string: “scholarly journals abstracts researcher OER image”

2.4.3 Integration into electronic databases

Electronic databases integrate indexing and abstracting to provide powerful search capabilities. Indexes allow users to filter by subject, author, or keyword, while abstracts provide summaries of documents. Together, they enhance retrieval efficiency and make vast collections accessible to users worldwide.

Fill in the blank:

- Electronic databases integrate indexing and abstracting to provide powerful _____ capabilities.

lanetonline.com

Box 2.4

Integration of Indexing and Abstracting in Electronic Databases

Electronic databases enhance information retrieval by seamlesy integrathy integraing and abstacting. During processing, documents are asigned standized "index index terms" (from a controlled words (free-text indesing) that desribe their main subjects.

Concrenently, concise, informative "abstract" sumirnzing abstract" sumiarzing the crease purpos's purpose, methods, nethods, results, and conclusion.

These components are stored atored as searchle metadata algedade sogte atc he algshde the full text. When a user search qury, datalarbestase datautate indetes suly simauseunly scars index fields and the abstract tets the abstract the full docunerdy. This muti-facted appuresessmore precise results indeies) anors imevidate context and reletanies the sserrace (the abstrat), significanty improving the efficiency and accuracy of finding relevnat information.

Pilot questions 2.4

1. What do library catalogues use indexing for?
2. Why are abstracts important in scholarly journals?
3. What type of abstract is common in medical journals?
4. How do electronic databases integrate indexing and abstracting?
5. What is one benefit of integrating indexing and abstracting in databases?

Series Summary

This Series has focused on the practical methods and techniques that underpin effective indexing and abstracting. Its purpose was to move beyond foundational concepts and show how

professionals apply these processes in real information environments. We began by exploring methods of indexing, contrasting manual and automated approaches, and considering the role of controlled vocabulary versus free indexing. We then examined techniques of abstracting, including informative, indicative, and structured formats, before turning to the tools and standards that guide practice, such as thesauri, classification schemes, international guidelines, and software applications. Finally, we looked at practical applications in library catalogues, scholarly journals, and electronic databases, demonstrating how these processes support retrieval and decision-making.

By completing this Series, you should now be able to describe and distinguish different methods of indexing (SLO 2.1, SLO 2.2), explain and apply techniques of abstracting (SLO 2.3), use appropriate tools and standards (SLO 2.4, SLO 2.5), and demonstrate practical applications in diverse contexts (SLO 2.6). These outcomes ensure that you are equipped not only with theoretical understanding but also with the ability to apply indexing and abstracting effectively in both print and electronic environments.

Glossary of Terms

Automated indexing The process of using computer algorithms to analyse documents and assign descriptors or keywords. It is faster and scalable but may lack the nuanced understanding of human indexers.

Classification scheme A systematic arrangement of subjects into categories, often represented by numbers or codes, such as the Dewey Decimal Classification. It provides a framework for organising information across collections.

Controlled vocabulary indexing A method of indexing that uses a predefined list of authorised terms, such as a thesaurus or subject headings, to ensure consistency and accuracy in retrieval.

Free indexing A flexible method of indexing where any words from a document can be chosen as descriptors, without relying on a controlled list. It allows variety but can reduce precision.

Indicative abstract A type of abstract that provides only a brief overview of a document, highlighting its scope and general themes without detailed coverage.

Informative abstract A type of abstract that gives a detailed summary of a document, including its purpose, methods, results, and conclusions.

Manual indexing The process where a human indexer reads or analyses a document and selects appropriate descriptors or keywords to represent its content.

Software tools Computer applications that support indexing and abstracting by automating processes, managing vocabularies, and integrating with databases.

Structured abstract An abstract organised into clearly labelled sections such as background, objectives, methods, results, and conclusions, commonly used in medical and scientific journals.

Thesaurus (information science) A structured list of terms showing relationships such as synonyms, broader terms, and narrower terms. It helps indexers choose consistent descriptors and improves retrieval accuracy.

lanetonline.com

Concept Check Questions [Series 2]

Objective Questions

1. Define manual indexing. *(Linked to SLO 2.1)*
2. Automated indexing uses _____ to analyse documents and assign descriptors. *(Linked to SLO 2.1)*
3. Controlled vocabulary indexing ensures _____ by using authorised terms. *(Linked to SLO 2.2)*
4. Which type of abstract provides a detailed summary including purpose, methods, results, and conclusions? *(Linked to SLO 2.3)*
5. ISO _____ provides guidelines for the content, organisation, and presentation of indexes. *(Linked to SLO 2.5)*

Short-Answer Questions

6. Explain one advantage of manual indexing. *(Linked to SLO 2.1)*
7. Distinguish between controlled vocabulary indexing and free indexing. *(Linked to SLO 2.2)*
8. Describe the main purpose of an indicative abstract. *(Linked to SLO 2.3)*
9. State one role of a thesaurus in indexing. *(Linked to SLO 2.4)*
10. Identify one practical application of abstracting in scholarly journals. *(Linked to SLO 2.6)*

Long-Answer Questions

11. Analyse the strengths and weaknesses of automated indexing compared to manual indexing. *(Linked to SLO 2.1)*
12. Evaluate the usefulness of structured abstracts in scientific communication. *(Linked to SLO 2.3)*
13. Assess the importance of international standards and guidelines in ensuring quality indexing and abstracting. *(Linked to SLO 2.5)*
14. Discuss how indexing and abstracting are integrated into electronic databases and their impact on retrieval. *(Linked to SLO 2.6)*

Answers to Concept Check Questions [Series 2]

Objective Questions

1. Manual indexing is the process where a human indexer reads or analyses a document and selects descriptors or keywords.
2. Computer algorithms.
3. Consistency.

lanetonline.com

4. Informative abstract.

5. ISO 999.

Short-Answer Questions

6. One advantage of manual indexing is accuracy, as human indexers can apply subject knowledge and judgement.

7. Controlled vocabulary indexing uses authorised terms from a thesaurus or subject list, ensuring consistency, while free indexing allows any words from the document, offering flexibility but less precision.

8. An indicative abstract provides a brief overview of the scope and themes of a document without detailed coverage.

9. A thesaurus guides indexers by showing relationships such as synonyms, broader terms, and narrower terms.

10. Abstracting in scholarly journals helps readers quickly determine the relevance of articles.

Long-Answer Questions

11. *Basic response:* Automated indexing is faster and scalable, while manual indexing is more accurate and nuanced. *Value-added response:* Automated indexing suits large collections but may misinterpret context, whereas manual indexing ensures subject expertise. A hybrid approach often balances speed and accuracy.

12. *Basic response:* Structured abstracts are useful because they organise information into labelled sections for clarity. *Value-added response:* They enhance scientific communication by standardising presentation, improving readability, and supporting evidence-based practice, especially in medical and technical fields.

13. *Basic response:* International standards ensure consistency and quality in indexing and abstracting. *Value-added response:* Standards such as ISO 999 and IFLA guidelines promote global uniformity, improve interoperability between systems, and enhance user trust in information services.

14. *Basic response:* Indexing and abstracting in electronic databases provide search filters and summaries to improve retrieval. *Value-added response:* Their integration enables advanced search capabilities, supports multidisciplinary access, and makes vast collections globally accessible, transforming how researchers and professionals interact with information.

Answers to Pilot Questions [Series 2]

Part 2.1 Methods of Indexing

- Manual indexing is the process where a human indexer reads or analyses a document and selects descriptors or keywords.
- Automated indexing is the use of computer algorithms to analyse documents and assign descriptors.

lanetonline.com

- Controlled vocabulary indexing uses authorised terms from a thesaurus or subject heading list.
- One advantage of manual indexing is accuracy, as human expertise ensures relevance and consistency.
- One limitation of free indexing is reduced precision due to variations in terminology.

Part 2.2 Techniques of Abstracting

- An informative abstract is a detailed summary of a document, including its purpose, methods, results, and conclusions.
- An indicative abstract is a brief overview of a document, highlighting its scope and general themes without detail.
- Structured abstracts are commonly used in medical journals.
- One component of an informative abstract is methodology.
- Structured abstracts are useful because they organise information into labelled sections, making it easier to locate specific details.

Part 2.3 Tools and Standards in Indexing and Abstracting

- A thesaurus in information science is a structured list of terms showing relationships such as synonyms, broader terms, and narrower terms.
- A classification scheme is a systematic arrangement of subjects into categories, often represented by numbers or codes.
- ISO 999 provides guidelines for the content, organisation, and presentation of indexes.
- The International Federation of Library Associations and Institutions (IFLA) issues guidelines for indexing and abstracting.
- One advantage of using software tools is improved efficiency through automation and reduced errors.

Part 2.4 Practical Applications

- Library catalogues use indexing to provide access points such as author, title, and subject.
- Abstracts are important in scholarly journals because they summarise articles and help readers determine relevance.
- Structured abstracts are common in medical journals.
- Electronic databases integrate indexing and abstracting by combining search filters with document summaries.
- One benefit of integrating indexing and abstracting in databases is enhanced retrieval efficiency.

References and Attributions [Series 2]

laneteonline.com

General References

- Lancaster, F. W. (2003). *Indexing and abstracting in theory and practice* (3rd ed.). London: Facet Publishing.
- Rowley, J., & Hartley, R. (2008). *Organising knowledge: An introduction to managing access to information* (4th ed.). Aldershot: Ashgate.
- Svenonius, E. (2000). *The intellectual foundation of information organisation*. Cambridge, MA: MIT Press.
- International Federation of Library Associations and Institutions (IFLA). (2017). *Guidelines for subject access in national bibliographies*. The Hague: IFLA.
- International Organization for Standardization. (1996). *ISO 999: Guidelines for the content, organisation, and presentation of indexes*. Geneva: ISO.

Illustrations

Part 2.1 Methods of Indexing

- *Plate 2.1 Manual indexing in practice*: AI-generated using prompt "Generate an image showing a librarian manually selecting descriptors from a research article." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "manual indexing librarian selecting descriptors OER image."
- *Figure 2.1 Automated indexing workflow*: AI-generated using prompt "Generate a diagram showing automated indexing workflow: document input, algorithm analysis, keyword assignment." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "automated indexing workflow algorithm keyword assignment OER diagram."
- *Box 2.1 Controlled vocabulary versus free indexing*: AI-generated using prompt "Generate a text box comparing controlled vocabulary indexing and free indexing, highlighting advantages and limitations." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "controlled vocabulary indexing vs free indexing comparison OER."

Part 2.2 Techniques of Abstracting

- *Figure 2.2 Components of an informative abstract*: AI-generated using prompt "Generate a diagram showing the components of an informative abstract: purpose, methods, results, conclusions." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "informative abstract components scientific writing OER diagram."
- *Plate 2.2 Indicative abstract in practice*: AI-generated using prompt "Generate an image showing a student scanning a journal article with a brief summary note." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "indicative abstract humanities social sciences OER image."
- *Box 2.2 Example of a structured abstract format*: AI-generated using prompt "Generate a text box showing a sample structured abstract with headings: background, objectives,

lanetonline.com

methods, results, conclusions." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "structured abstract format medical journal OER example."

Part 2.3 Tools and Standards in Indexing and Abstracting

- *Figure 2.3 Thesaurus structure in indexing*: AI-generated using prompt "Generate a diagram showing a thesaurus structure with broader, narrower, and related terms." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "thesaurus structure broader narrower related terms OER diagram."
- *Box 2.3 Selected international standards for indexing and abstracting*: AI-generated using prompt "Generate a text box listing examples of international standards such as ISO 999 and IFLA guidelines." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "ISO 999 indexing standards IFLA guidelines OER."
- *Plate 2.3 Software tools for indexing and abstracting*: AI-generated using prompt "Generate an image showing a librarian using indexing software on a computer." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "library indexing abstracting software tools OER image."

Part 2.4 Practical Applications

- *Figure 2.4 Indexing in library catalogues*: AI-generated using prompt "Generate a diagram showing how indexing works in a library catalogue with author, title, and subject fields." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "library catalogue indexing author title subject OER diagram."
- *Plate 2.4 Abstracting in scholarly journals*: AI-generated using prompt "Generate an image showing a researcher reading journal abstracts to decide which articles to consult." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "scholarly journals abstracts researcher OER image."
- *Box 2.4 Integration of indexing and abstracting in electronic databases*: AI-generated using prompt "Generate a text box summarising how indexing and abstracting are integrated into electronic databases to enhance retrieval." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "integration indexing abstracting electronic databases retrieval OER."

- **Course code: LIS 413**
- **Course title: Indexing and Abstracting**
- **Course unit load: 2 Units**
- **Series list:**

1. Series 1: Basic Concepts of Indexing and Abstracting
2. Series 2: Methods and Techniques of Indexing and Abstracting
3. Series 3: Thesaurus Design and Updating
4. Series 4: Types of Indexes and Abstracts
5. Series 5: Indexing and Abstracting Services and Evaluation

laneonline.com

Series 3: Thesaurus Design and Updating

- **Part 3.1 Criteria for Evaluating Indexes and Abstracts**
  - 3.1.1 Accuracy and relevance
  - 3.1.2 Consistency and clarity
  - 3.1.3 Neutrality and objectivity
- **Part 3.2 Quality Indicators in Indexing and Abstracting**
  - 3.2.1 Completeness and coverage
  - 3.2.2 Timeliness and currency
  - 3.2.3 Usability and accessibility
- **Part 3.3 Methods of Quality Assurance**
  - 3.3.1 Peer review and editorial control
  - 3.3.2 Use of standards and guidelines
  - 3.3.3 Feedback and continuous improvement
- **Part 3.4 Case Studies and Best Practices**
  - 3.4.1 Evaluation of library indexes
  - 3.4.2 Assessment of abstracts in scholarly journals
  - 3.4.3 Benchmarking electronic databases

Introduction

As information grows in volume and complexity, the need to evaluate and maintain quality in indexing and abstracting becomes critical. This Series is designed to help you understand not only how these processes are carried out but also how their effectiveness can be measured. By focusing on evaluation criteria, quality indicators, and methods of assurance, you will gain the ability to judge whether an index or abstract truly supports efficient information retrieval.

We begin by examining the criteria for evaluating indexes and abstracts, such as accuracy, relevance, consistency, and neutrality. From there, we move to quality indicators, including completeness, timeliness, and usability. Next, we explore methods of quality assurance, such as peer review, adherence to standards, and continuous improvement. Finally, we conclude with case studies and best practices, showing how evaluation is applied in libraries, scholarly journals, and electronic databases. Together, these Parts will equip you with the skills to critically assess and improve indexing and abstracting practices in diverse contexts.

lanetonline.com

Series Learning Outcomes

Upon completing this Series, you should be able to:

- **SLO 3.1** identify and explain the key criteria for evaluating indexes and abstracts, including accuracy, relevance, consistency, and neutrality.
- **SLO 3.2** describe and assess quality indicators such as completeness, timeliness, usability, and accessibility in indexing and abstracting.
- **SLO 3.3** apply methods of quality assurance, including peer review, editorial control, and adherence to standards and guidelines.
- **SLO 3.4** evaluate the role of feedback and continuous improvement in maintaining high-quality indexing and abstracting.
- **SLO 3.5** analyse case studies of library indexes, scholarly abstracts, and electronic databases to identify best practices.
- **SLO 3.6** demonstrate the ability to critically assess indexing and abstracting outputs in diverse contexts and recommend improvements.

3.1 Criteria for Evaluating Indexes and Abstracts

Evaluation of indexes and abstracts is essential to ensure they serve their purpose in information retrieval. The criteria used provide a framework for assessing their quality and effectiveness. In this Part, we will focus on accuracy and relevance, consistency and clarity, and neutrality and objectivity.

3.1.1 Accuracy and relevance

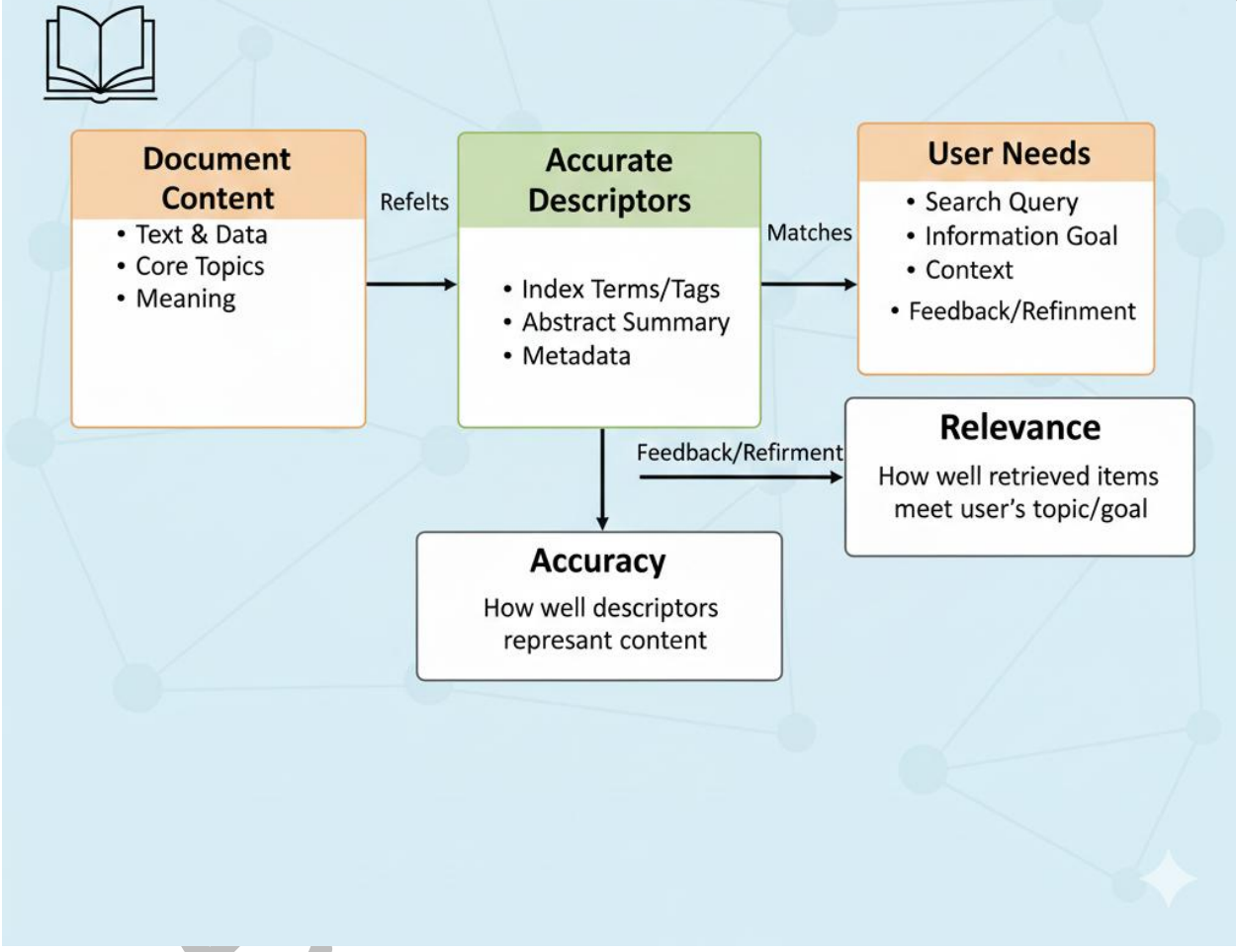
Accuracy means that the terms or summaries used in indexing and abstracting correctly represent the content of the document. **Relevance** ensures that the chosen descriptors or abstracts match the information needs of users.

Fill in the blank:

- Accuracy ensures that descriptors correctly represent the _____ of the document.

lanetonline.com

Figure 3.1 Accuracy and Relevance in Evaluation



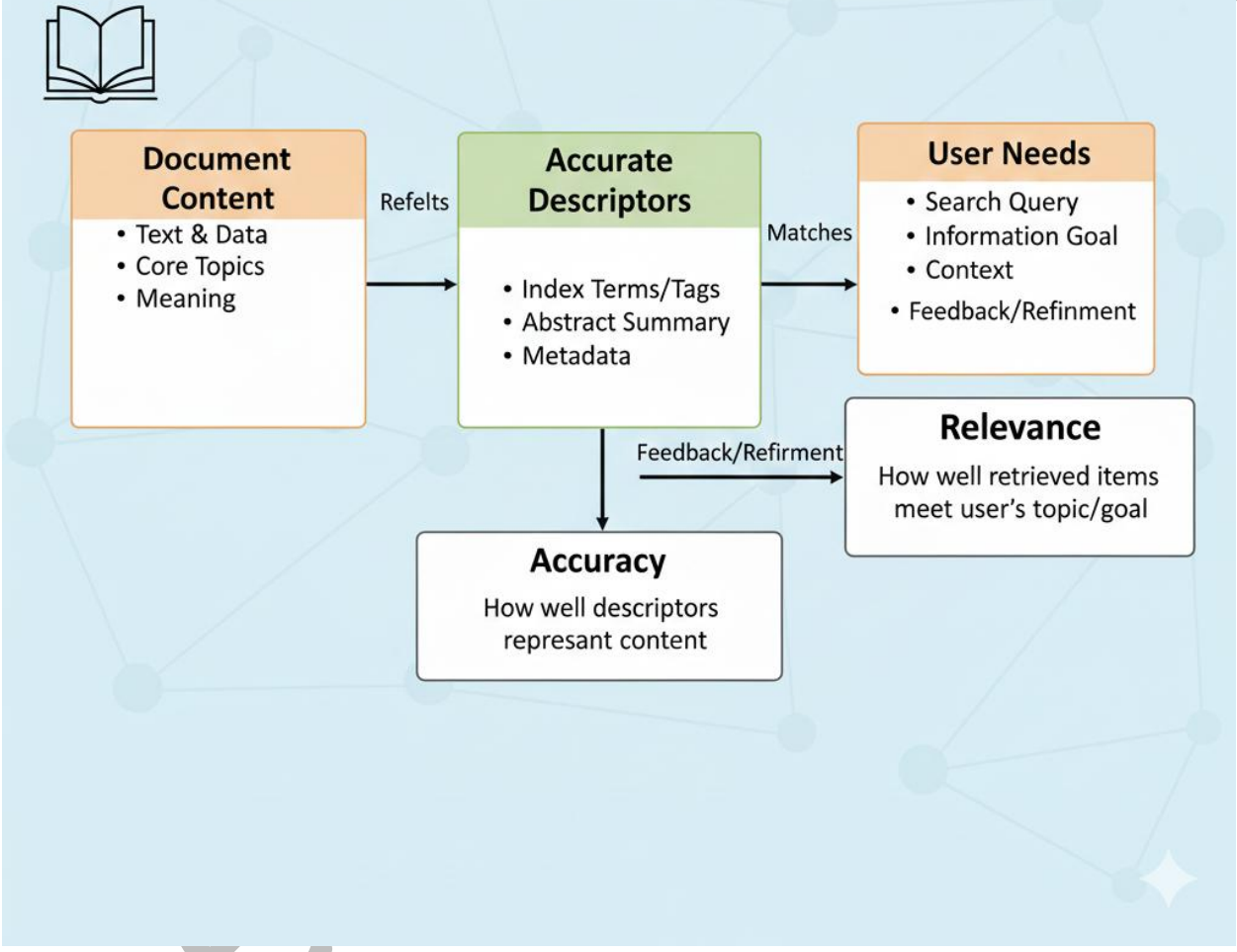
3.1.2 Consistency and clarity

Consistency refers to the uniform use of terms and rules across documents, ensuring predictability in retrieval. **Clarity** means that indexes and abstracts are easy to understand, avoiding ambiguity or overly technical language.

Fill in the blank:

- Consistency ensures uniform use of _____ across documents.

Figure 3.1 Accuracy and Relevance in Evaluation

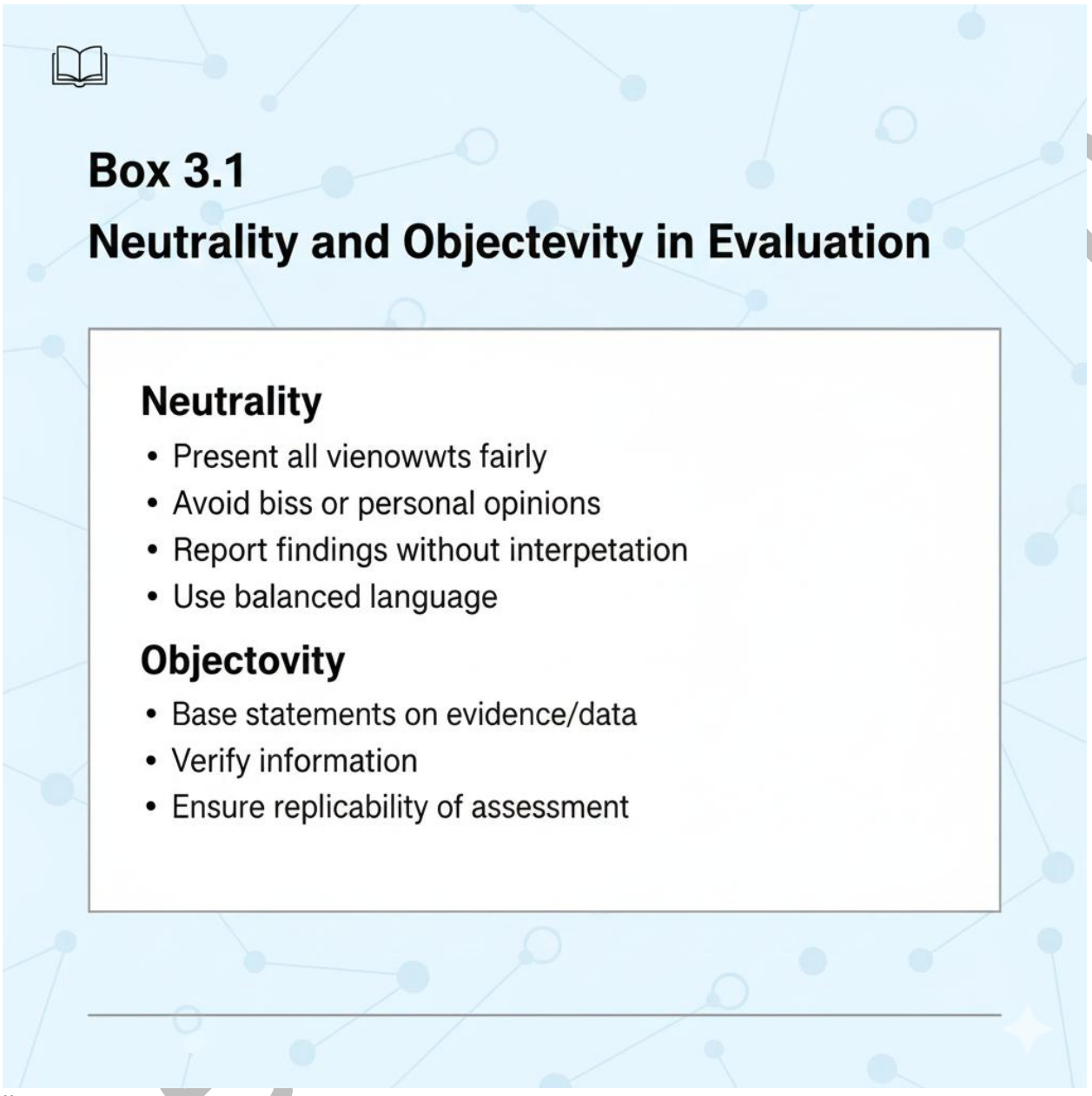


3.1.3 Neutrality and objectivity

Neutrality requires that abstracts and indexes avoid bias, personal opinions, or promotional language. **Objectivity** ensures that the content is presented factually, allowing users to make their own judgements.

Fill in the blank:

- Neutrality requires that abstracts avoid _____ or promotional language.



”

Pilot questions 3.1

1. What does accuracy mean in indexing and abstracting?
2. Why is relevance important in evaluation?
3. What does consistency ensure?
4. State one aspect of clarity in abstracts.
5. Why should abstracts maintain neutrality and objectivity?

3.2 Quality Indicators in Indexing and Abstracting

Quality indicators provide measurable aspects that show whether indexing and abstracting outputs are effective and reliable. In this Part, we will focus on completeness and coverage, timeliness and currency, and usability and accessibility.

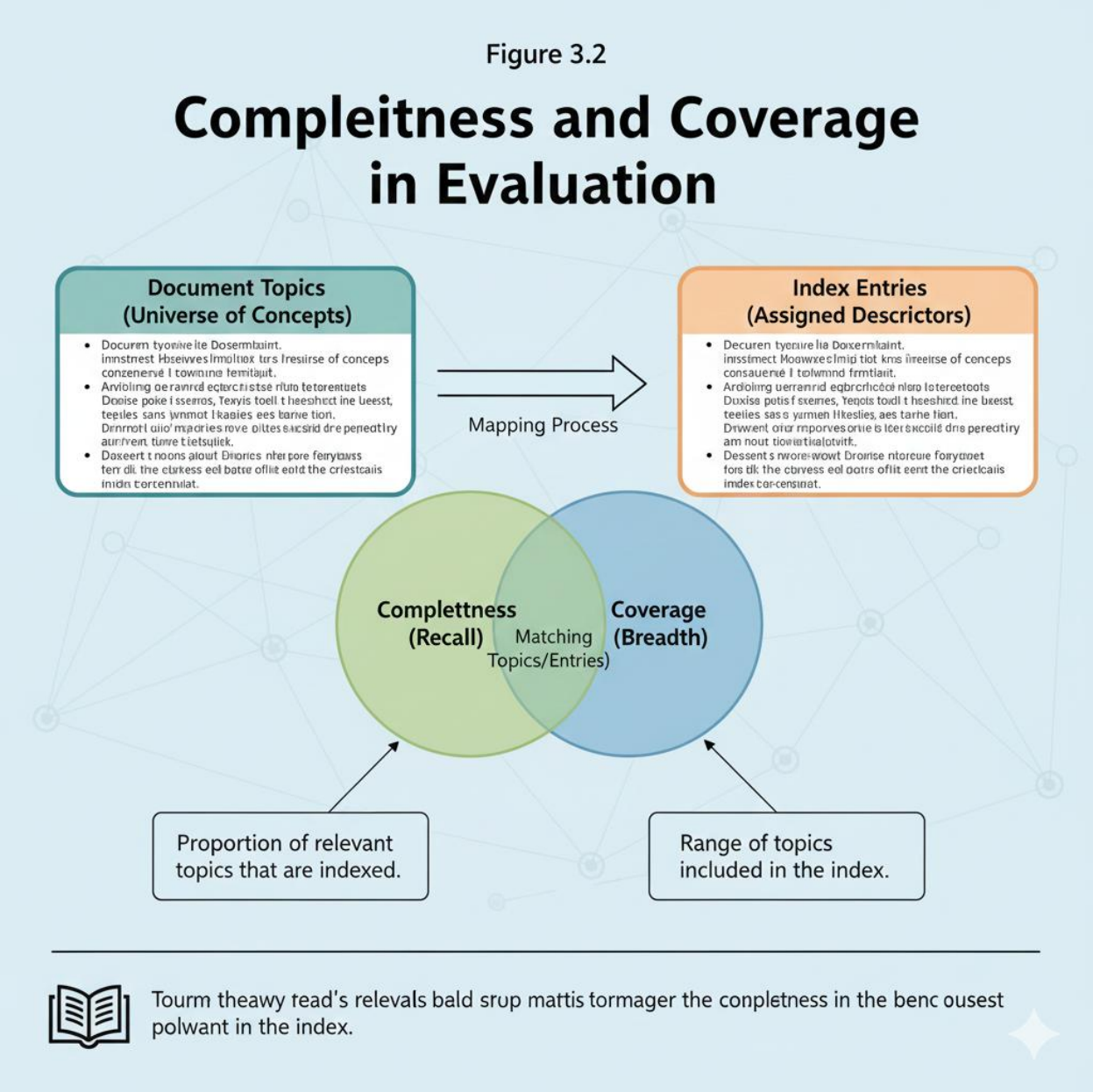
3.2.1 Completeness and coverage

Completeness means that all significant topics in a document are represented in the index or abstract. **Coverage** refers to the extent to which the index or abstract reflects the scope of the document or collection.

Fill in the blank:

- Completeness ensures that all significant _____ in a document are represented in the index or abstract.

lanetonline.com

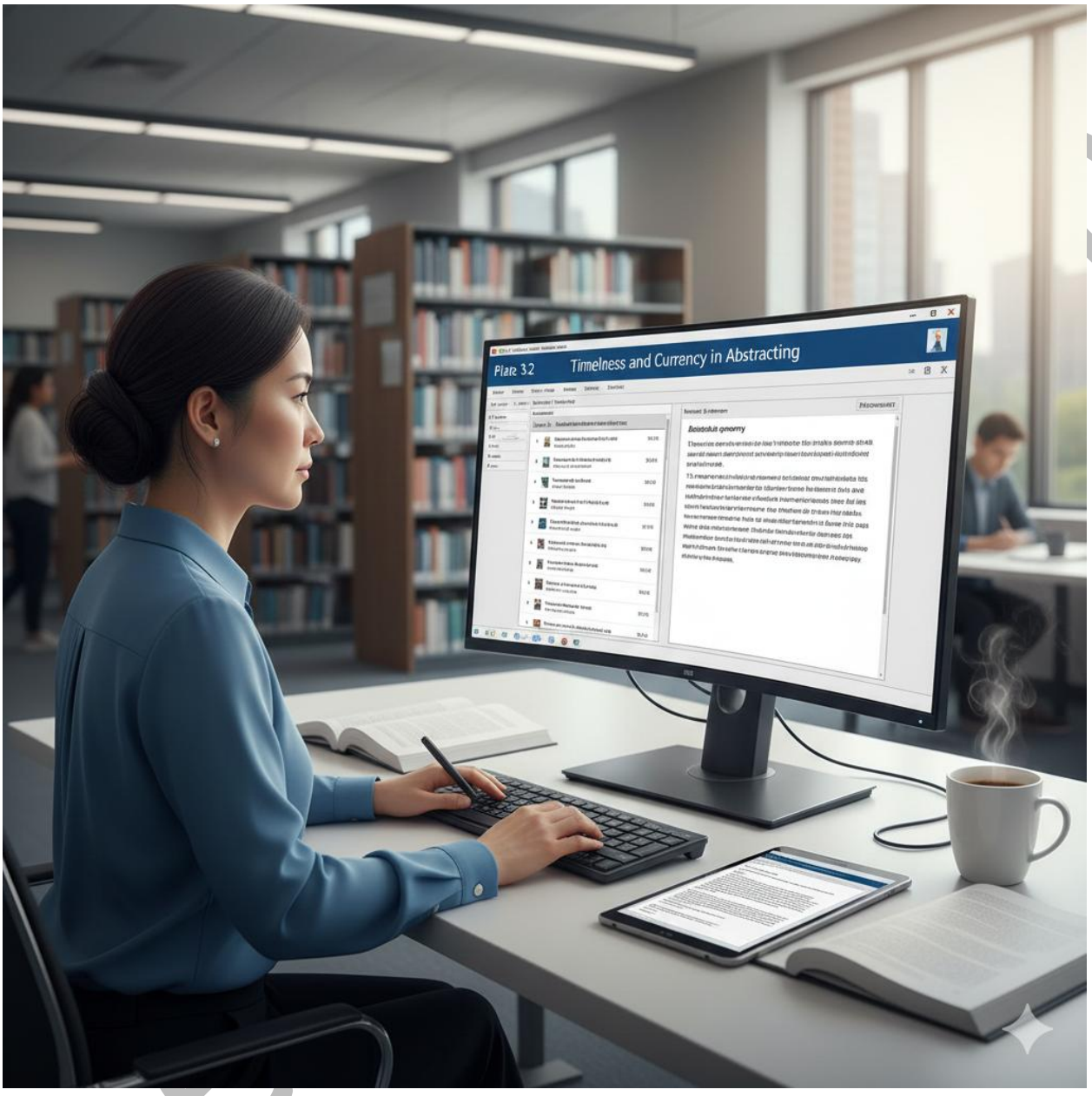


3.2.2 Timeliness and currency

Timeliness refers to how quickly indexing and abstracting are completed after a document is published. **Currency** means that indexes and abstracts are updated regularly to reflect the most recent information.

Fill in the blank:

- Timeliness refers to how quickly indexing and abstracting are completed after a document is _____.



3.2.3 Usability and accessibility

Usability means that indexes and abstracts are easy to navigate and use. **Accessibility** ensures that they are available to all users, including those with disabilities, by following inclusive design principles.

Fill in the blank:

- Usability ensures that indexes and abstracts are easy to _____ and use.

[Insert box here] Short description: Text box listing usability and accessibility features such as clear layout, search functions, and inclusive design. Caption: *Box 3.2 Usability and accessibility in evaluation* Sample AI prompt: “Generate a text box listing usability and accessibility features such as clear layout, search functions, and inclusive design.” Search string: “usability accessibility indexing abstracting inclusive design OER”

Pilot questions 3.2

1. What does completeness mean in indexing and abstracting?
2. What does coverage refer to?
3. Why is timeliness important in evaluation?
4. What does currency ensure?
5. State one feature of usability or accessibility in indexes and abstracts.

3.3 Methods of Quality Assurance

Quality assurance in indexing and abstracting ensures that outputs meet professional standards and serve users effectively. This Part explores peer review and editorial control, the use of standards and guidelines, and feedback with continuous improvement.

3.3.1 Peer review and editorial control

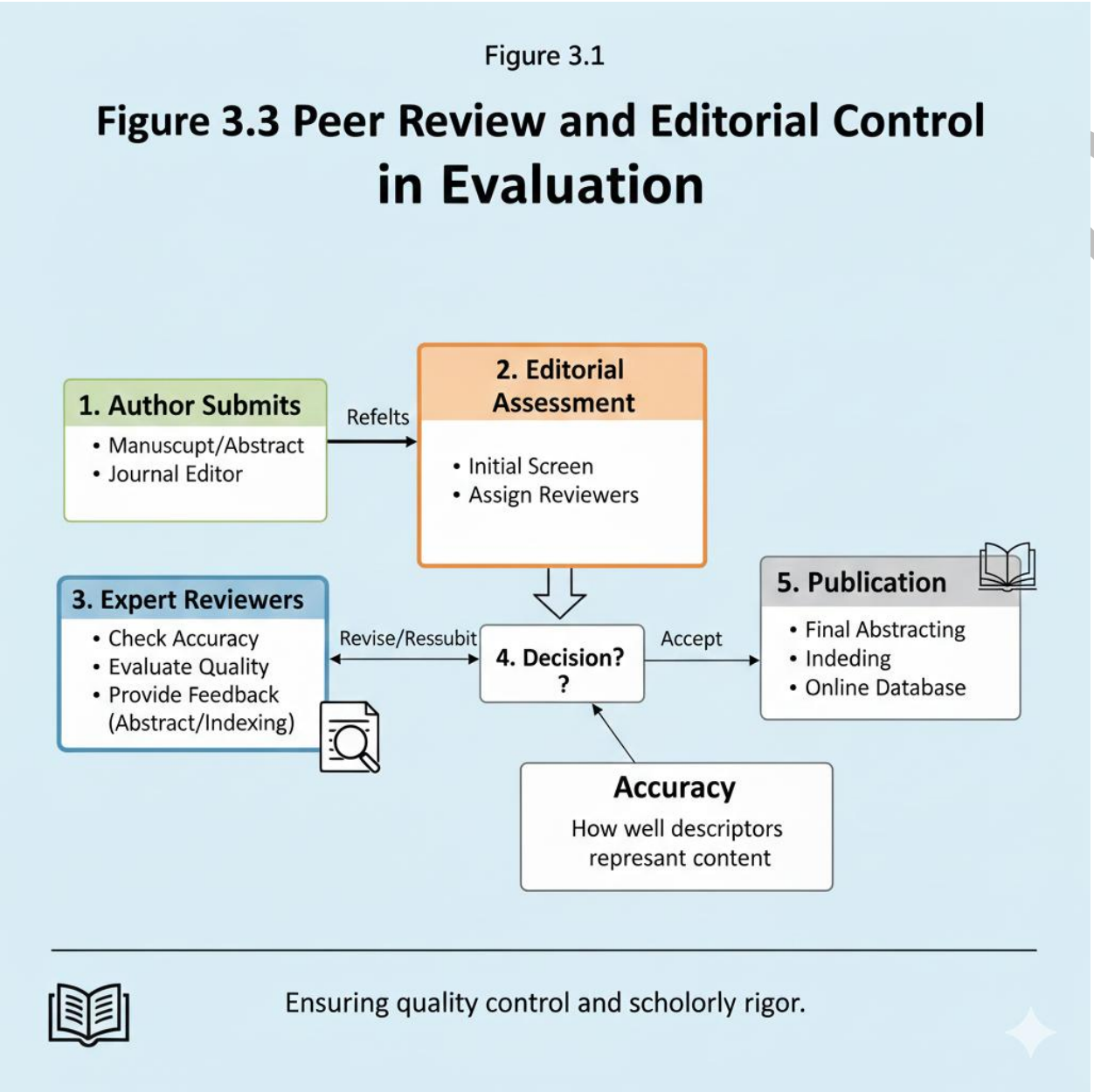
Peer review involves subject experts evaluating indexes and abstracts to confirm accuracy and relevance. **Editorial control** ensures that outputs follow established rules and maintain consistency across documents.

Fill in the blank:

- Peer review involves subject _____ evaluating indexes and abstracts for accuracy and relevance.

lanetonline.com

Figure 3.1

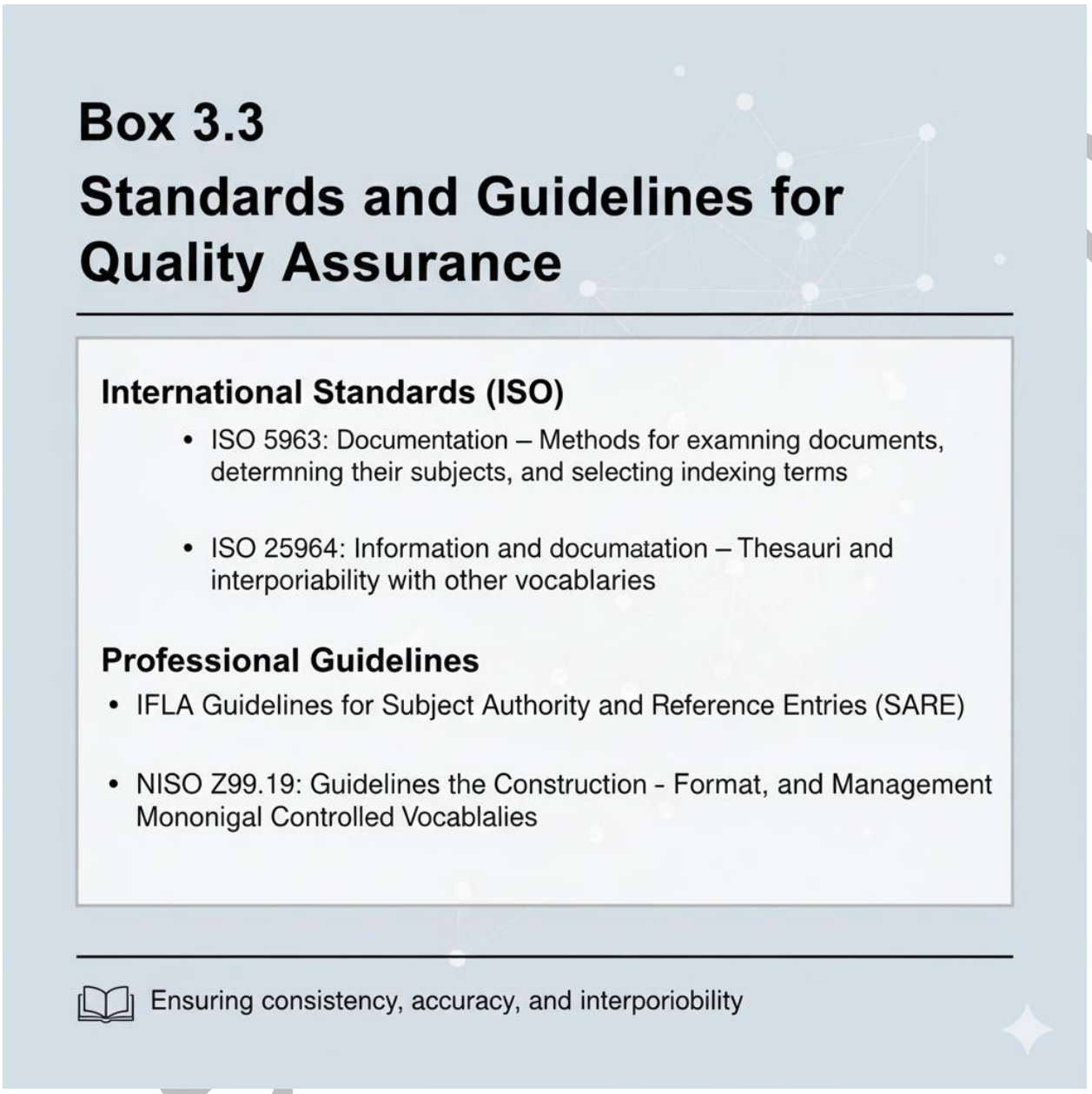


3.3.2 Use of standards and guidelines

Standards and guidelines provide frameworks for ensuring quality. For example, ISO 999 outlines rules for indexes, while IFLA guidelines support subject access in bibliographies. Adherence to these ensures uniformity and reliability.

Fill in the blank:

- ISO 999 outlines rules for the _____, organisation, and presentation of indexes.



3.3.3 Feedback and continuous improvement

Feedback from users and professionals helps identify weaknesses in indexes and abstracts. Continuous improvement involves updating processes, retraining staff, and refining tools to maintain high quality.

Fill in the blank:

- Continuous improvement involves updating processes and _____ staff to maintain high quality.

Pilot questions 3.3

1. What is peer review in indexing and abstracting?
2. What does editorial control ensure?
3. Which ISO standard provides rules for indexes?
4. Why are guidelines important in quality assurance?
5. How does feedback support continuous improvement?

3.4 Case Studies and Best Practices

Case studies and best practices provide real-world examples of how evaluation and quality assurance are applied in indexing and abstracting. They help learners connect theoretical criteria

and indicators with practical applications. In this Part, we will examine library indexes, scholarly abstracts, and electronic databases.

3.4.1 Evaluation of library indexes

Library indexes are assessed based on accuracy, consistency, and coverage. Evaluations often check whether subject headings are applied uniformly and whether all relevant topics are represented.

Fill in the blank:

- Library indexes are assessed based on accuracy, consistency, and _____.

[Insert figure here] Short description: Diagram showing evaluation criteria applied to a library index. Caption: *Figure 3.4 Evaluation of library indexes* Sample AI prompt: "Generate a diagram showing evaluation criteria applied to a library index." Search string: "evaluation library indexes accuracy consistency coverage OER diagram"

3.4.2 Assessment of abstracts in scholarly journals

Abstracts in scholarly journals are evaluated for clarity, neutrality, and completeness. Structured abstracts are often preferred because they make evaluation easier by following a standard format.

Fill in the blank:

- Abstracts in scholarly journals are evaluated for clarity, neutrality, and _____.

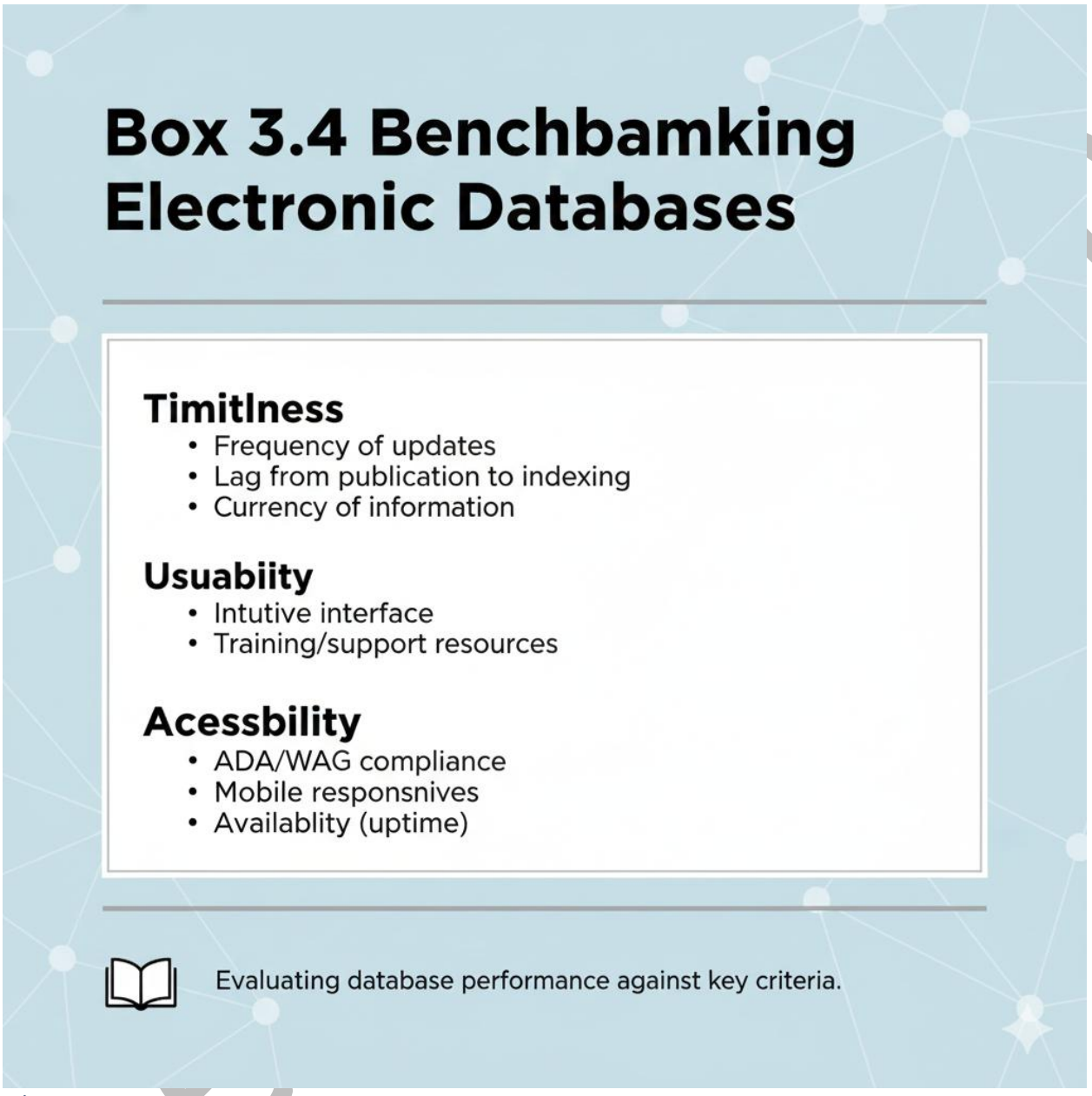
lanetonline.com

3.4.3 Benchmarking electronic databases

Electronic databases are benchmarked against indicators such as timeliness, usability, and accessibility. Evaluations often compare how quickly new content is indexed and how effectively users can retrieve information.

Fill in the blank:

- Electronic databases are benchmarked against indicators such as timeliness, usability, and _____.



Pilot questions 3.4

1. What criteria are used to evaluate library indexes?
2. Why are structured abstracts preferred in scholarly journals?
3. What indicators are used to benchmark electronic databases?
4. State one benefit of evaluating abstracts in journals.
5. How does benchmarking improve database quality?

Series Summary

This Series has highlighted the importance of evaluating and maintaining quality in indexing and abstracting, ensuring that these processes genuinely support effective information retrieval. We

began by considering the criteria for evaluation, focusing on accuracy, relevance, consistency, clarity, neutrality, and objectivity. Building on this, we explored quality indicators such as completeness, coverage, timeliness, currency, usability, and accessibility. We then examined methods of quality assurance, including peer review, editorial control, adherence to standards, and the role of feedback in continuous improvement. Finally, we looked at case studies and best practices in libraries, scholarly journals, and electronic databases, showing how evaluation is applied in practice.

By completing this Series, you should now be able to identify and explain evaluation criteria (SLO 3.1), assess quality indicators (SLO 3.2), apply methods of quality assurance (SLO 3.3 and SLO 3.4), and analyse case studies to recognise best practices (SLO 3.5). Most importantly, you are equipped to critically assess indexing and abstracting outputs in diverse contexts and recommend improvements (SLO 3.6), ensuring that your work contributes to high-quality information services.

Glossary of Terms

Accessibility Ensuring that indexes and abstracts can be used by all people, including those with disabilities, often through inclusive design features such as clear layouts and assistive technologies.

Accuracy The degree to which descriptors or abstracts correctly represent the actual content of a document.

Clarity The quality of being easy to understand, avoiding ambiguity or overly technical language in indexes and abstracts.

Completeness Making sure that all significant topics in a document are included in the index or abstract.

Consistency The uniform use of terms and rules across documents, which helps users predict and trust retrieval results.

Coverage The extent to which an index or abstract reflects the scope of a document or collection.

Currency Keeping indexes and abstracts up to date so they reflect the most recent information available.

Editorial control Oversight by editors to ensure that indexes and abstracts follow established rules and maintain consistency.

Feedback Comments or suggestions from users and professionals that help identify weaknesses and guide improvements in indexing and abstracting.

Neutrality Avoiding bias, personal opinions, or promotional language in abstracts and indexes.

Objectivity Presenting information factually and without distortion, allowing users to form their own judgements.

Peer review Evaluation of indexes and abstracts by subject experts to confirm accuracy, relevance, and quality.

lanetonline.com

Quality indicators Measurable aspects such as completeness, timeliness, usability, and accessibility that show whether indexing and abstracting outputs are effective.

Standards and guidelines Formal rules and recommendations, such as ISO 999 and IFLA guidelines, that ensure uniformity and reliability in indexing and abstracting.

Timeliness The speed with which indexing and abstracting are completed after a document is published.

Usability The ease with which users can navigate and make use of indexes and abstracts.

Concept Check Questions [Series 3]

Objective Questions

1. Accuracy ensures that descriptors correctly represent the _____ of the document. *(Linked to SLO 3.1)*
2. Consistency refers to the uniform use of _____ across documents. *(Linked to SLO 3.1)*
3. Which quality indicator ensures that indexes and abstracts are kept up to date? *(Linked to SLO 3.2)*
4. Peer review involves subject _____ evaluating indexes and abstracts. *(Linked to SLO 3.3)*
5. ISO _____ provides guidelines for the content, organisation, and presentation of indexes. *(Linked to SLO 3.3)*

Short-Answer Questions

6. Explain why relevance is important in evaluating indexes and abstracts. *(Linked to SLO 3.1)*
7. Distinguish between completeness and coverage in quality indicators. *(Linked to SLO 3.2)*
8. Describe one role of editorial control in quality assurance. *(Linked to SLO 3.3)*
9. State one way feedback supports continuous improvement in indexing and abstracting. *(Linked to SLO 3.4)*
10. Identify one criterion used to evaluate abstracts in scholarly journals. *(Linked to SLO 3.5)*

Long-Answer Questions

11. Analyse the strengths and weaknesses of using timeliness and currency as quality indicators. *(Linked to SLO 3.2)*
12. Evaluate the usefulness of standards and guidelines such as ISO 999 and IFLA in quality assurance. *(Linked to SLO 3.3)*
13. Assess the importance of neutrality and objectivity in abstracts, especially in scholarly communication. *(Linked to SLO 3.1)*

laretonline.com

14. Discuss how benchmarking electronic databases improves retrieval and overall service quality. *(Linked to SLO 3.5, SLO 3.6)*

Answers to Concept Check Questions [Series 3]

Objective Questions

1. Content.
2. Terms.
3. Currency.
4. Experts.
5. ISO 999.

Short-Answer Questions

6. Relevance ensures that descriptors or abstracts match user information needs, making retrieval effective.

7. Completeness means all significant topics are represented, while coverage refers to the scope reflected.

8. Editorial control ensures outputs follow established rules and maintain consistency across documents.

9. Feedback identifies weaknesses and guides updates, retraining, or refinement of processes.

10. Clarity is one criterion used to evaluate abstracts in scholarly journals.

Long-Answer Questions

11. *Basic response:* Timeliness ensures indexing and abstracting are done quickly, while currency keeps them updated. *Value-added response:* Timeliness supports rapid access to new information, but rushing may reduce accuracy. Currency maintains relevance, yet frequent updates require resources. Balancing both is key to sustainable quality.

12. *Basic response:* Standards and guidelines provide frameworks that ensure uniformity and reliability. *Value-added response:* ISO 999 and IFLA guidelines promote global consistency, interoperability, and trust. They also support training and benchmarking, though flexibility is needed to adapt to local contexts.

13. *Basic response:* Neutrality and objectivity prevent bias and ensure factual representation in abstracts. *Value-added response:* In scholarly communication, they uphold credibility, support peer review integrity, and allow readers to form independent judgements. Bias undermines trust and can distort research dissemination.

14. *Basic response:* Benchmarking electronic databases uses indicators like timeliness, usability, and accessibility to improve retrieval. *Value-added response:* It enables comparison across systems, highlights strengths and weaknesses, and drives innovation. Benchmarking

lanetonline.com

ensures databases remain competitive, user-centred, and aligned with evolving information needs.

Answers to Pilot Questions [Series 3]

Part 3.1 Criteria for Evaluating Indexes and Abstracts

- Accuracy means that descriptors or abstracts correctly represent the content of the document.
- Relevance is important because it ensures that information provided matches the needs of users.
- Consistency ensures uniform use of terms across documents.
- Clarity means abstracts are easy to understand and avoid ambiguity.
- Abstracts should maintain neutrality and objectivity to avoid bias or promotional language.

Part 3.2 Quality Indicators in Indexing and Abstracting

- Completeness means all significant topics in a document are represented.
- Coverage refers to the extent to which the scope of a document or collection is reflected.
- Timeliness is important because it ensures indexing and abstracting are completed soon after publication.
- Currency ensures that indexes and abstracts are kept up to date with the latest information.
- One feature of usability or accessibility is clear layout and inclusive design.

Part 3.3 Methods of Quality Assurance

- Peer review is the evaluation of indexes and abstracts by subject experts.
- Editorial control ensures that outputs follow established rules and maintain consistency.
- ISO 999 provides rules for the content, organisation, and presentation of indexes.
- Guidelines are important because they provide frameworks for ensuring uniformity and reliability.
- Feedback supports continuous improvement by identifying weaknesses and guiding updates.

Part 3.4 Case Studies and Best Practices

- Library indexes are evaluated based on accuracy, consistency, and coverage.
- Structured abstracts are preferred in scholarly journals because they follow a standard format and improve clarity.

lanetonline.com

- Indicators used to benchmark electronic databases include timeliness, usability, and accessibility.
- One benefit of evaluating abstracts in journals is helping readers quickly judge relevance.
- Benchmarking improves database quality by highlighting strengths and weaknesses and guiding enhancements.

Answers to Pilot Questions [Series 3]

Part 3.1 Criteria for Evaluating Indexes and Abstracts

- Accuracy means that descriptors or abstracts correctly represent the content of the document.
- Relevance is important because it ensures that information provided matches the needs of users.
- Consistency ensures uniform use of terms across documents.
- Clarity means abstracts are easy to understand and avoid ambiguity.
- Abstracts should maintain neutrality and objectivity to avoid bias or promotional language.

Part 3.2 Quality Indicators in Indexing and Abstracting

- Completeness means all significant topics in a document are represented.
- Coverage refers to the extent to which the scope of a document or collection is reflected.
- Timeliness is important because it ensures indexing and abstracting are completed soon after publication.
- Currency ensures that indexes and abstracts are kept up to date with the latest information.
- One feature of usability or accessibility is clear layout and inclusive design.

Part 3.3 Methods of Quality Assurance

- Peer review is the evaluation of indexes and abstracts by subject experts.
- Editorial control ensures that outputs follow established rules and maintain consistency.
- ISO 999 provides rules for the content, organisation, and presentation of indexes.
- Guidelines are important because they provide frameworks for ensuring uniformity and reliability.
- Feedback supports continuous improvement by identifying weaknesses and guiding updates.

Part 3.4 Case Studies and Best Practices

- Library indexes are evaluated based on accuracy, consistency, and coverage.

lanetonline.com

- Structured abstracts are preferred in scholarly journals because they follow a standard format and improve clarity.
- Indicators used to benchmark electronic databases include timeliness, usability, and accessibility.
- One benefit of evaluating abstracts in journals is helping readers quickly judge relevance.
- Benchmarking improves database quality by highlighting strengths and weaknesses and guiding enhancements.

References and Attributions [Series 3]

General References

- Lancaster, F. W. (2003). *Indexing and abstracting in theory and practice* (3rd ed.). London: Facet Publishing.
- Rowley, J., & Hartley, R. (2008). *Organising knowledge: An introduction to managing access to information* (4th ed.). Aldershot: Ashgate.
- Svenonius, E. (2000). *The intellectual foundation of information organisation*. Cambridge, MA: MIT Press.
- International Federation of Library Associations and Institutions (IFLA). (2017). *Guidelines for subject access in national bibliographies*. The Hague: IFLA.
- International Organization for Standardization. (1996). *ISO 999: Guidelines for the content, organisation, and presentation of indexes*. Geneva: ISO.

Illustrations

Part 3.1 Criteria for Evaluating Indexes and Abstracts

- *Figure 3.1 Accuracy and relevance in evaluation*: AI-generated using prompt “Generate a diagram showing the link between document content, accurate descriptors, and user needs.” Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: “accuracy relevance indexing abstracting evaluation OER diagram.”
- *Plate 3.1 Consistency and clarity in indexing*: AI-generated using prompt “Generate an image showing a librarian applying the same subject heading rules across multiple records.” Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: “consistency clarity indexing abstracting librarian OER image.”
- *Box 3.1 Neutrality and objectivity in evaluation*: AI-generated using prompt “Generate a text box listing principles of neutrality and objectivity in abstracting.” Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: “neutrality objectivity abstracting evaluation principles OER.”

Part 3.2 Quality Indicators in Indexing and Abstracting

- *Figure 3.2 Completeness and coverage in evaluation*: AI-generated using prompt “Generate a diagram showing how completeness and coverage map document topics to

laronline.com

index entries." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "completeness coverage indexing abstracting evaluation OER diagram."

- *Plate 3.2 Timeliness and currency in abstracting*: AI-generated using prompt "Generate an image showing a librarian updating abstracts immediately after journal publication." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "timeliness currency indexing abstracting librarian OER image."
- *Box 3.2 Usability and accessibility in evaluation*: AI-generated using prompt "Generate a text box listing usability and accessibility features such as clear layout, search functions, and inclusive design." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "usability accessibility indexing abstracting inclusive design OER."

Part 3.3 Methods of Quality Assurance

- *Figure 3.3 Peer review and editorial control*: AI-generated using prompt "Generate a diagram showing the peer review process with experts checking abstracts before publication." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "peer review editorial control indexing abstracting evaluation OER diagram."
- *Box 3.3 Standards and guidelines for quality assurance*: AI-generated using prompt "Generate a text box listing examples of standards and guidelines used in indexing and abstracting." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "ISO 999 IFLA guidelines indexing abstracting standards OER."
- *Plate 3.3 Feedback and continuous improvement in practice*: AI-generated using prompt "Generate an image showing a librarian collecting user feedback to improve indexing and abstracting services." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "feedback continuous improvement indexing abstracting librarian OER image."

Part 3.4 Case Studies and Best Practices

- *Figure 3.4 Evaluation of library indexes*: AI-generated using prompt "Generate a diagram showing evaluation criteria applied to a library index." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "evaluation library indexes accuracy consistency coverage OER diagram."
- *Plate 3.4 Assessment of abstracts in scholarly journals*: AI-generated using prompt "Generate an image showing a researcher reviewing abstracts in a journal database." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "assessment scholarly journal abstracts clarity neutrality completeness OER image."
- *Box 3.4 Benchmarking electronic databases*: AI-generated using prompt "Generate a text box listing benchmarking indicators for electronic databases: timeliness, usability, accessibility." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "benchmarking electronic databases timeliness usability accessibility OER."

- **Course code: LIS 413**

lanetonline.com

- **Course title: Indexing and Abstracting**
- **Course unit load: 2 Units**
- **Series list:**

1. Series 1: Basic Concepts of Indexing and Abstracting
2. Series 2: Methods and Techniques of Indexing and Abstracting
3. Series 3: Thesaurus Design and Updating
4. Series 4: Types of Indexes and Abstracts
5. Series 5: Indexing and Abstracting Services and Evaluation

Series 4: Types of Indexes and Abstracts

- **Part 4.1 Fundamentals of Information Retrieval Systems**
  - 4.1.1 Definition and purpose of information retrieval systems
  - 4.1.2 Components of retrieval systems (indexing, searching, ranking)
  - 4.1.3 Types of retrieval systems (library catalogues, databases, search engines)
- **Part 4.2 Search Strategies and Techniques**
  - 4.2.1 Boolean operators and keyword searching
  - 4.2.2 Controlled vocabulary and subject searching
  - 4.2.3 Advanced search techniques (truncation, proximity, filters)
- **Part 4.3 Evaluation of Retrieval Systems**
  - 4.3.1 Precision and recall
  - 4.3.2 Relevance and ranking
  - 4.3.3 User satisfaction and usability testing
- **Part 4.4 Applications and Emerging Trends**
  - 4.4.1 Retrieval in digital libraries and academic databases
  - 4.4.2 Web search engines and discovery tools
  - 4.4.3 Emerging trends: AI, semantic search, and personalised retrieval

Introduction

Information retrieval systems are at the heart of modern information services, enabling users to locate, access, and evaluate resources efficiently. This Series is designed to provide you with a clear understanding of how these systems work, why they are essential, and how they continue to

lanetonline.com

evolve in response to technological change and user needs. By studying their components, search strategies, evaluation methods, and applications, you will gain both theoretical knowledge and practical skills for navigating diverse retrieval environments.

We begin with the fundamentals, defining information retrieval systems and examining their components and types. From there, we move to search strategies and techniques, exploring Boolean operators, controlled vocabularies, and advanced search methods. Next, we consider how retrieval systems are evaluated, focusing on precision, recall, relevance, and usability. Finally, we look at applications in digital libraries, databases, and web search engines, before considering emerging trends such as artificial intelligence, semantic search, and personalised retrieval. Together, these Parts will equip you to use, evaluate, and adapt retrieval systems effectively in professional and academic contexts.

Series Learning Outcomes

Upon completing this Series, you should be able to:

- **SLO 4.1** define and explain the purpose, components, and types of information retrieval systems.
- **SLO 4.2** apply search strategies and techniques, including Boolean operators, controlled vocabularies, and advanced methods.
- **SLO 4.3** evaluate retrieval systems using measures such as precision, recall, relevance, and usability.
- **SLO 4.4** analyse user satisfaction and usability testing as part of system evaluation.
- **SLO 4.5** describe and assess applications of retrieval systems in digital libraries, academic databases, and web search engines.
- **SLO 4.6** examine emerging trends such as artificial intelligence, semantic search, and personalised retrieval, and discuss their implications for future practice.

4.1 Fundamentals of Information Retrieval Systems

Information retrieval systems are designed to help users find and access information efficiently. They combine indexing, searching, and ranking processes to connect user queries with relevant documents. In this Part, we will define their purpose, explore their components, and outline the main types of retrieval systems.

4.1.1 Definition and purpose of information retrieval systems

An **information retrieval system** is a tool or platform that stores, organises, and retrieves information based on user queries. Its purpose is to bridge the gap between large collections of data and the specific needs of users.

Fill in the blank:

- An information retrieval system stores, organises, and _____ information based on user queries.

lanetonline.com

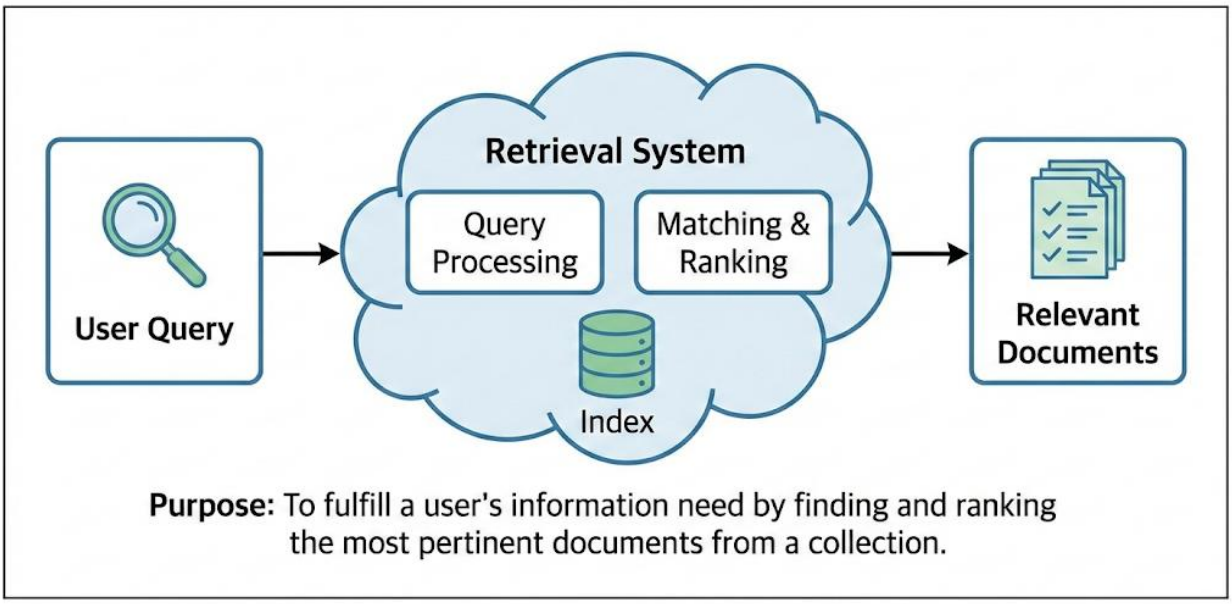


Figure 4.1 Definition and purpose of retrieval systems

4.1.2 Components of retrieval systems

The main components are:

- **Indexing**: Organising documents into searchable structures.
- **Searching**: Matching user queries with indexed content.
- **Ranking**: Ordering results based on relevance.

Fill in the blank:

- Ranking orders results based on _____ to the user's query.

lanetonline

Box 4.1 Components of retrieval systems

1. Indexing: The process of analyzing and storing documents to facilitate fast and accurate retrieval, often by creating an inverted index.
2. Searching: The process of processing a user query and matching it against the indexed documents to find relevant results.
3. Ranking: The process of ordering the retrieved documents based on their estimated relevance to the user's query.

4.1.3 Types of retrieval systems

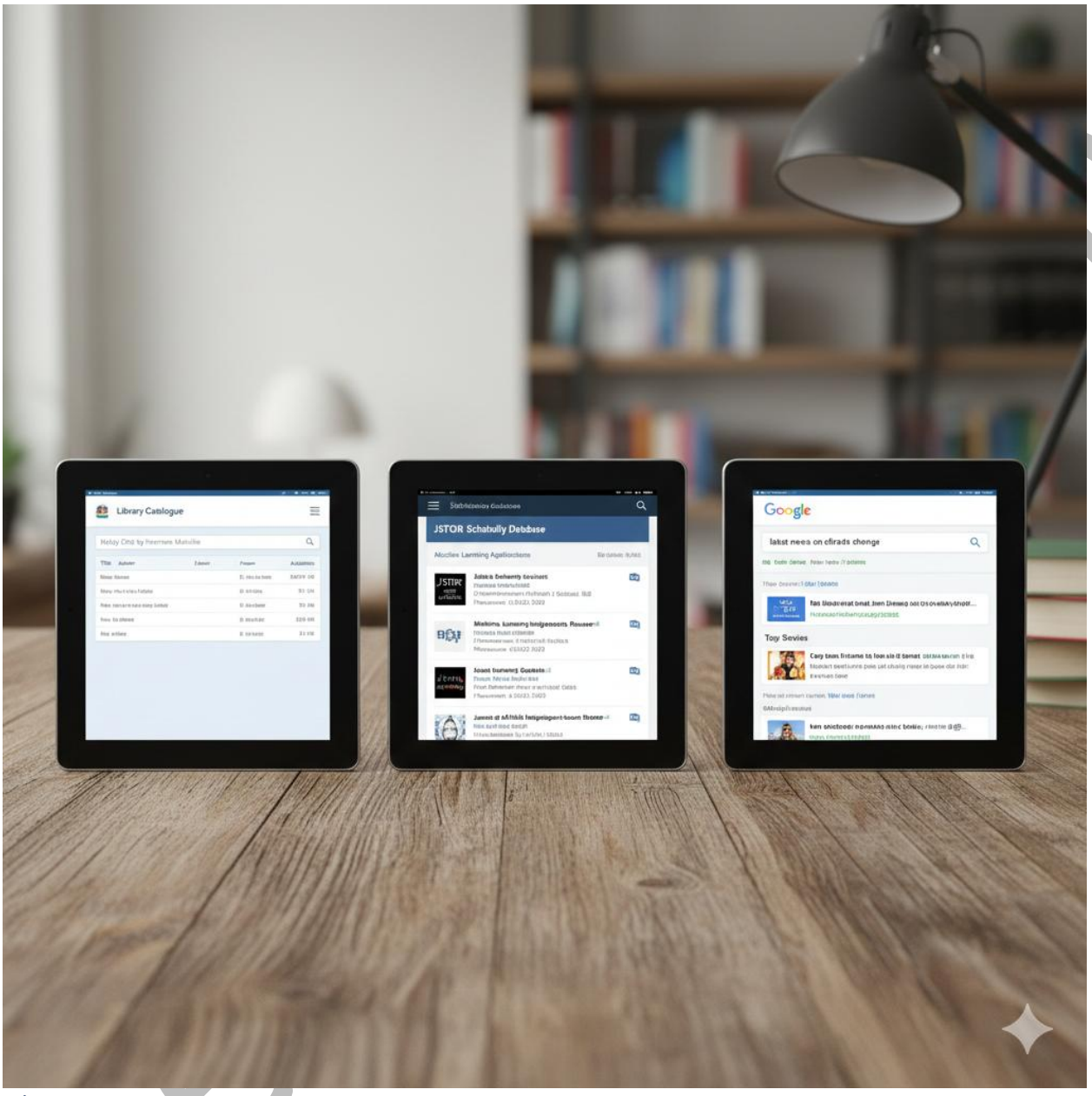
Types include:

- **Library catalogues**: Organised records of books and resources.
- **Databases**: Structured collections of scholarly or specialised information.
- **Search engines**: Web-based systems that index and retrieve online content.

Fill in the blank:

- Library catalogues provide organised records of _____ and resources.

lanetonline



Pilot questions 4.1

1. What is the purpose of an information retrieval system?
2. Name the three main components of retrieval systems.
3. What does ranking do in retrieval systems?
4. Give one example of a retrieval system type.
5. Why are retrieval systems important for users?

4.2 Search Strategies and Techniques

Effective searching is central to using information retrieval systems. Search strategies and techniques help users refine queries, improve precision, and retrieve relevant results. In this Part, we will explore Boolean operators, controlled vocabulary, and advanced search methods.

4.2.1 Boolean operators and keyword searching

Boolean operators (AND, OR, NOT) are used to combine or exclude keywords in searches. They help narrow or broaden results.

- **AND** retrieves records containing all specified terms.
- **OR** retrieves records containing any of the terms.
- **NOT** excludes records containing a specified term.

Fill in the blank:

- The Boolean operator _____ is used to exclude records containing a specified term.

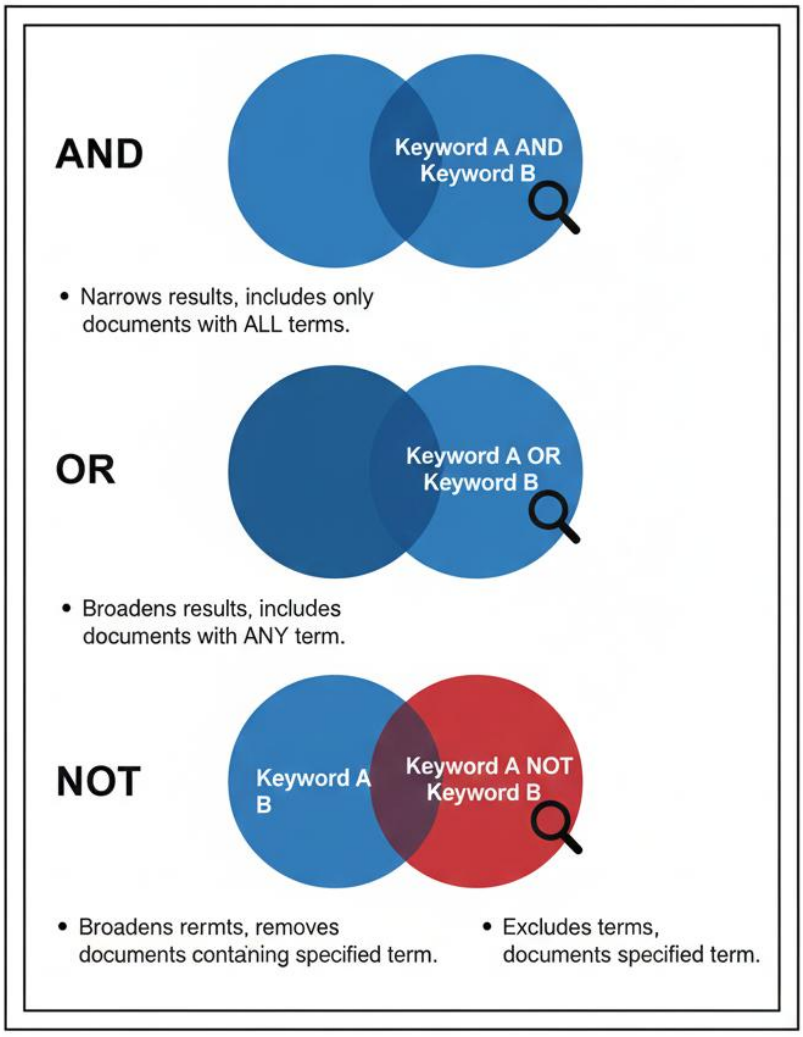


Figure 4.2 Boulean operators in searching

4.2.2 Controlled vocabulary and subject searching

Controlled vocabulary refers to a standardised set of terms used in indexing, such as subject headings or thesauri. **Subject searching** uses these controlled terms to improve precision and consistency in retrieval.

Fill in the blank:

- Controlled vocabulary refers to a standardised set of _____ used in indexing.

Box 4.2 Controlled vocalulary examples

- 1. Library of Locgress Subject Headings (LCSH): A comprehensive system for categorizan materials in academic public libraries.
- 2. Medical Subject Headings (MeSH): A thesaurus used by National Library of Modimine for indexing articles in ruMed Pu-Med database and other biomoical resources.
- 3. Dewey Decrimal Classifiration (DDC): A propoarty system organizing all non-fiction books on library shelves.
- 4. Universal Decimal Classiciration (UDC) A European system all for orgasistem for clasising all knowledge, used in many research librares.
- 5. Art & Architecture Thesartus (AAT): structured vo-decariblay to descrbing art, architecture and material material culture.
- 6. Faceted Application of Subject Termsisnty (FAST): simplified web---friendly version LCST).
- Purpose: To provide a consistent, standalized way to describe content, improving search precision and recall.

4.2.3 Advanced search techniques

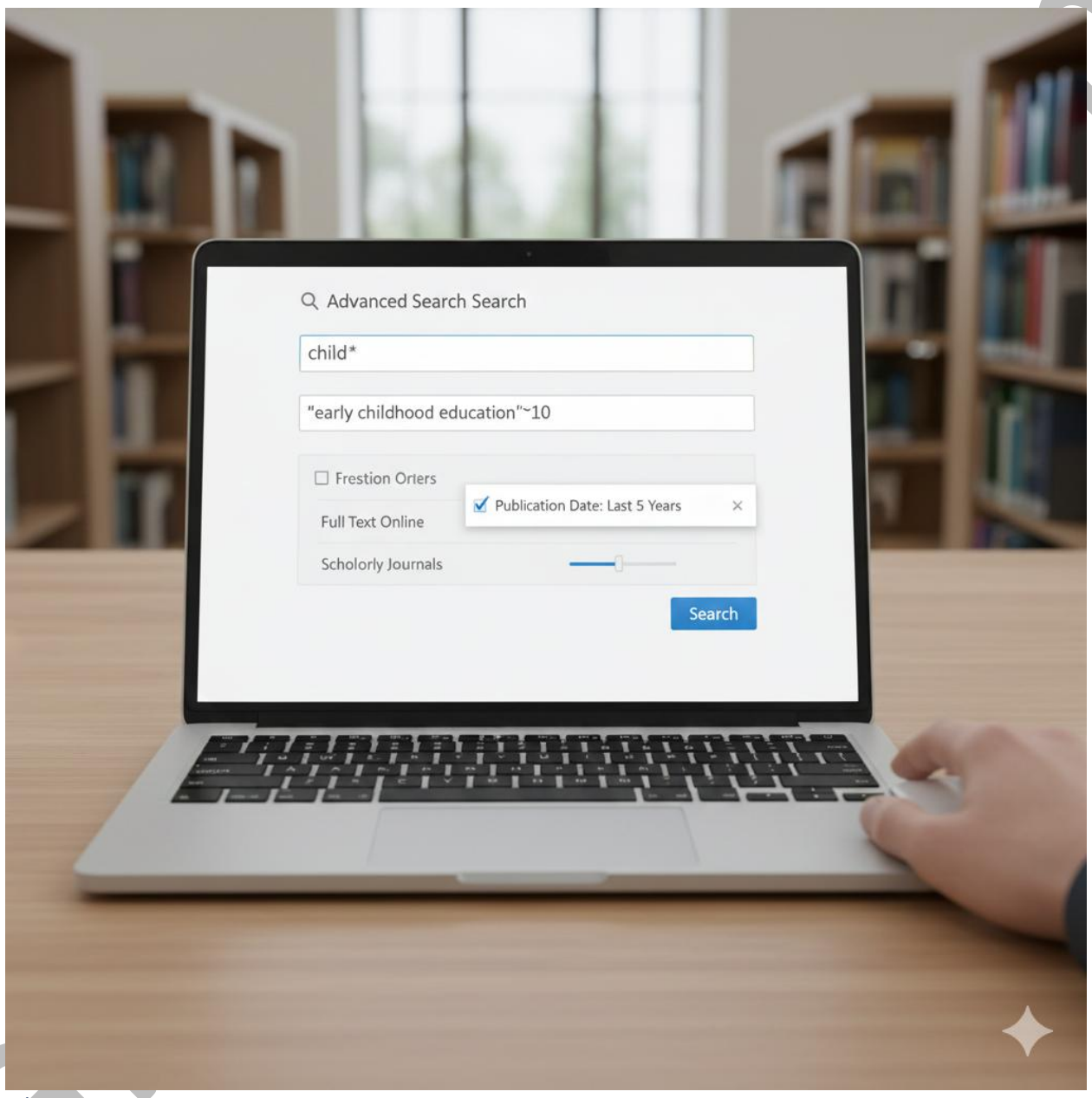
Advanced techniques include:

- **Truncation**: Using symbols (e.g., *) to search for word variants (e.g., child* retrieves child, children, childhood).
- **Proximity searching**: Finding words within a certain distance of each other.

- **Filters and limits**: Restricting searches by date, language, or format.

Fill in the blank:

- Truncation uses symbols to search for word _____.



Pilot questions 4.2

1. What are the three main Boolean operators?
2. What does the operator NOT do in searching?
3. What is controlled vocabulary?
4. Give one example of a controlled vocabulary system.
5. Name one advanced search technique and explain how it works.

4.3 Evaluation of Retrieval Systems

Evaluating retrieval systems is essential to determine how well they meet user needs. This Part focuses on precision and recall, relevance and ranking, and user satisfaction with usability testing.

4.3.1 Precision and recall

- **Precision** measures the proportion of retrieved documents that are relevant.
- **Recall** measures the proportion of relevant documents that are successfully retrieved. Together, they provide a balanced view of system effectiveness.

Fill in the blank:

- Precision measures the proportion of retrieved documents that are _____.

lanetonline.com

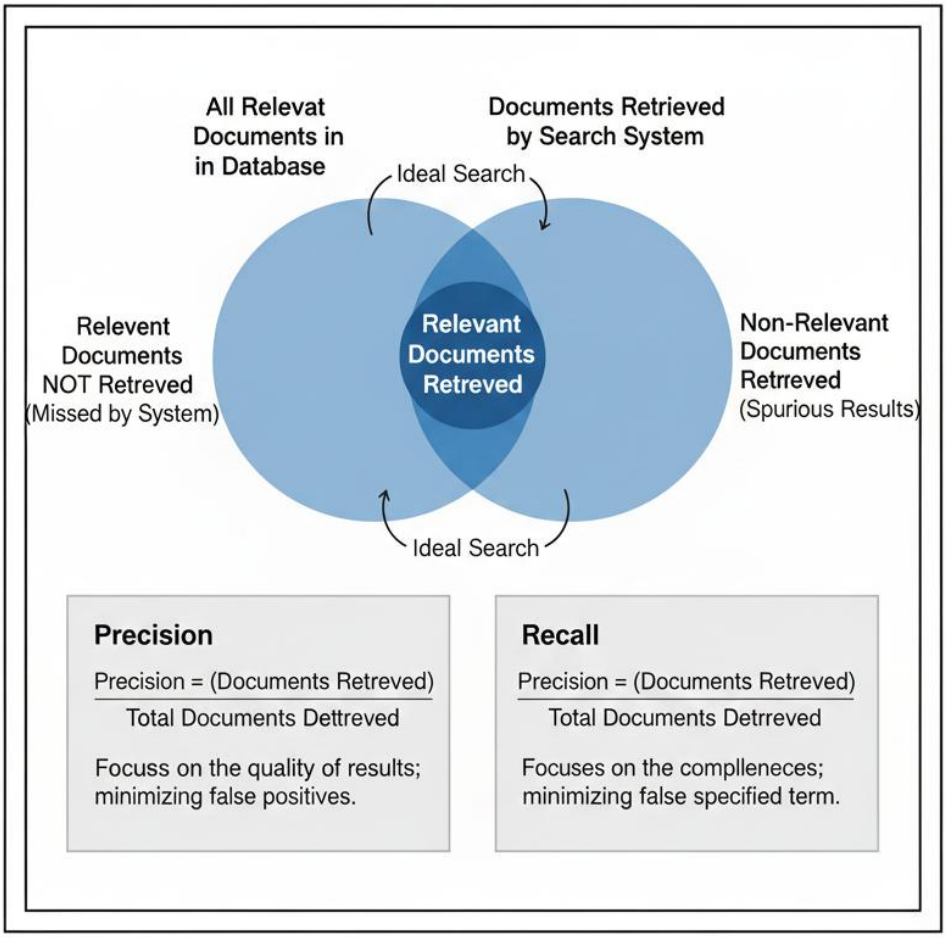


Figure 4.3 Precision and recall in retrieval evaluation

”

4.3.2 Relevance and ranking

- **Relevance** refers to how closely retrieved documents match the user's query or information need.
- **Ranking** orders results so that the most relevant appear first, improving efficiency in retrieval.

Fill in the blank:

- Ranking ensures that the most _____ documents appear first in search results.

Box 4.3 Reletance and ranking in retrieval systems

1. Reletance:

The degres of proccess of analyzing and storust pioring information satisfies not, often by creating an inverted index index.

The degree of which af retrieved document or piece's information need. I is subjeťtiive-dependınd, and the primary goal of any IR.

2. Ranking

It is mat process ordering rebieved feecemts based on fhd levan IR system.

2. Ranking

The order of ordich thän retieved documents ire presented to the user, typuiitally from relsant. Effective ranking ensure the most usefu reseful results on seen first, signficanly impacimacting user satisfaction.

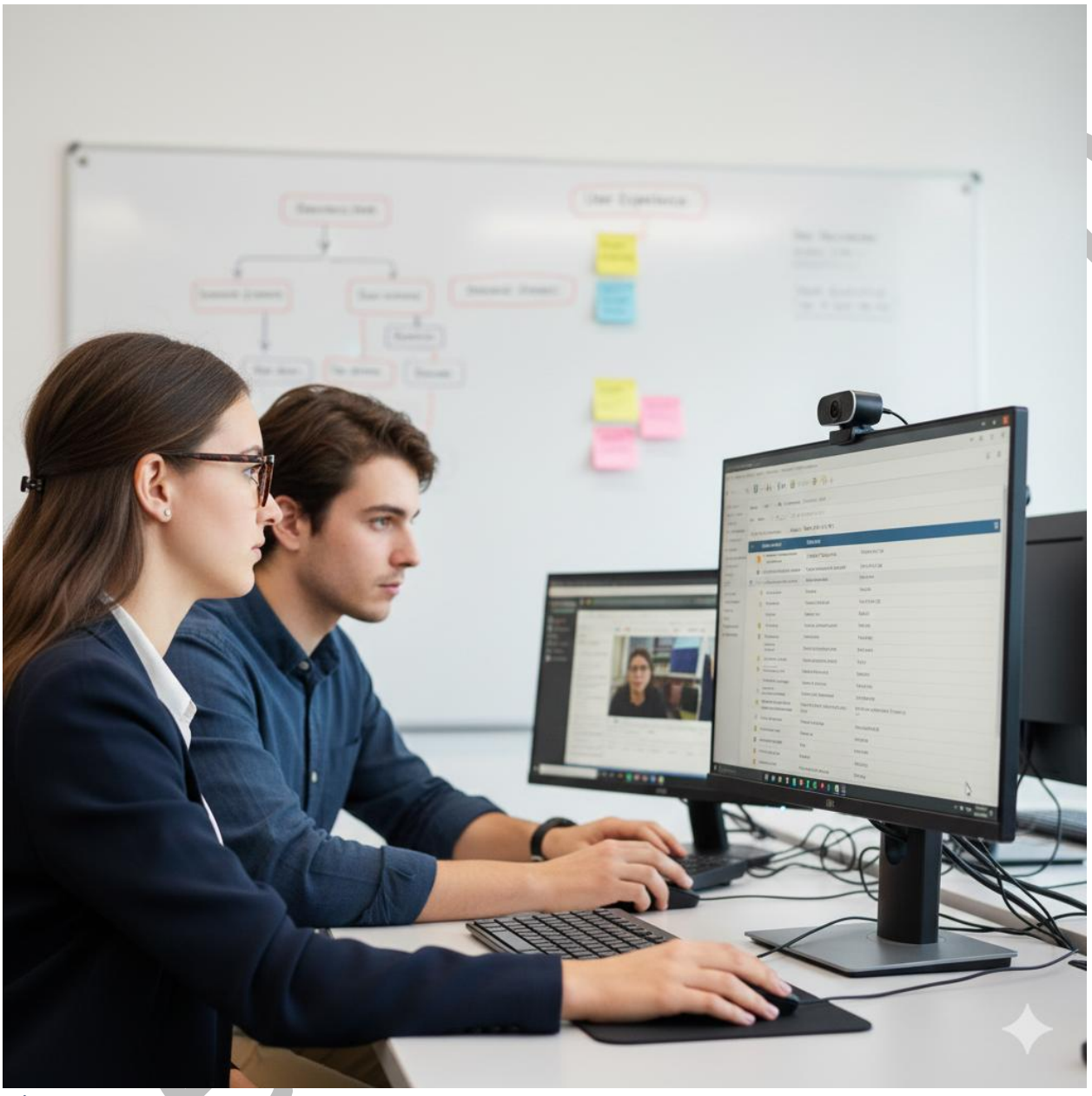
- Together, relerance and ranking are the core criteria for evaluting the effectievess of a retrieval system's performance

4.3.3 User satisfaction and usability testing

- **User satisfaction** measures how well users feel the system meets their needs.
- **Usability testing** involves observing users as they interact with the system to identify strengths and weaknesses.

Fill in the blank:

- Usability testing involves observing _____ as they interact with the system.



Pilot questions 4.3

1. What does precision measure in retrieval systems?
2. What does recall measure?
3. Why is relevance important in evaluation?
4. What does ranking do in search results?
5. How is usability testing conducted?

4.4 Applications and Emerging Trends

Information retrieval systems are applied across diverse environments, from libraries to web search engines, and they continue to evolve with new technologies. This Part explores practical applications and highlights emerging trends shaping the future of retrieval.

4.4.1 Retrieval in digital libraries and academic databases

Digital libraries and academic databases provide structured access to scholarly resources. Retrieval systems here rely on metadata, controlled vocabularies, and advanced search tools to support research.

Fill in the blank:

- Digital libraries and academic databases provide structured access to _____ resources.

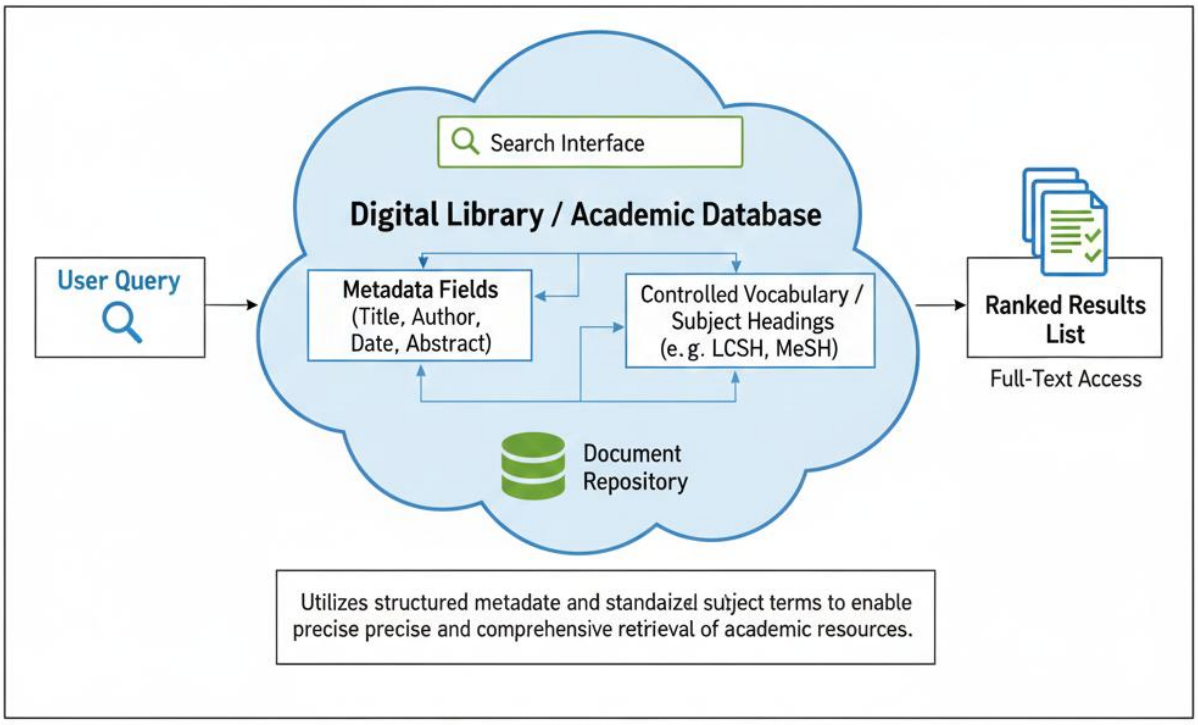


Figure 4.4 Retreveal in digital libraries and databases

4.4.2 Web search engines and discovery tools

Web search engines index vast amounts of online content, while discovery tools integrate multiple databases into a single search interface. Both aim to simplify access and improve relevance for users.

Fill in the blank:

- Discovery tools integrate multiple _____ into a single search interface.

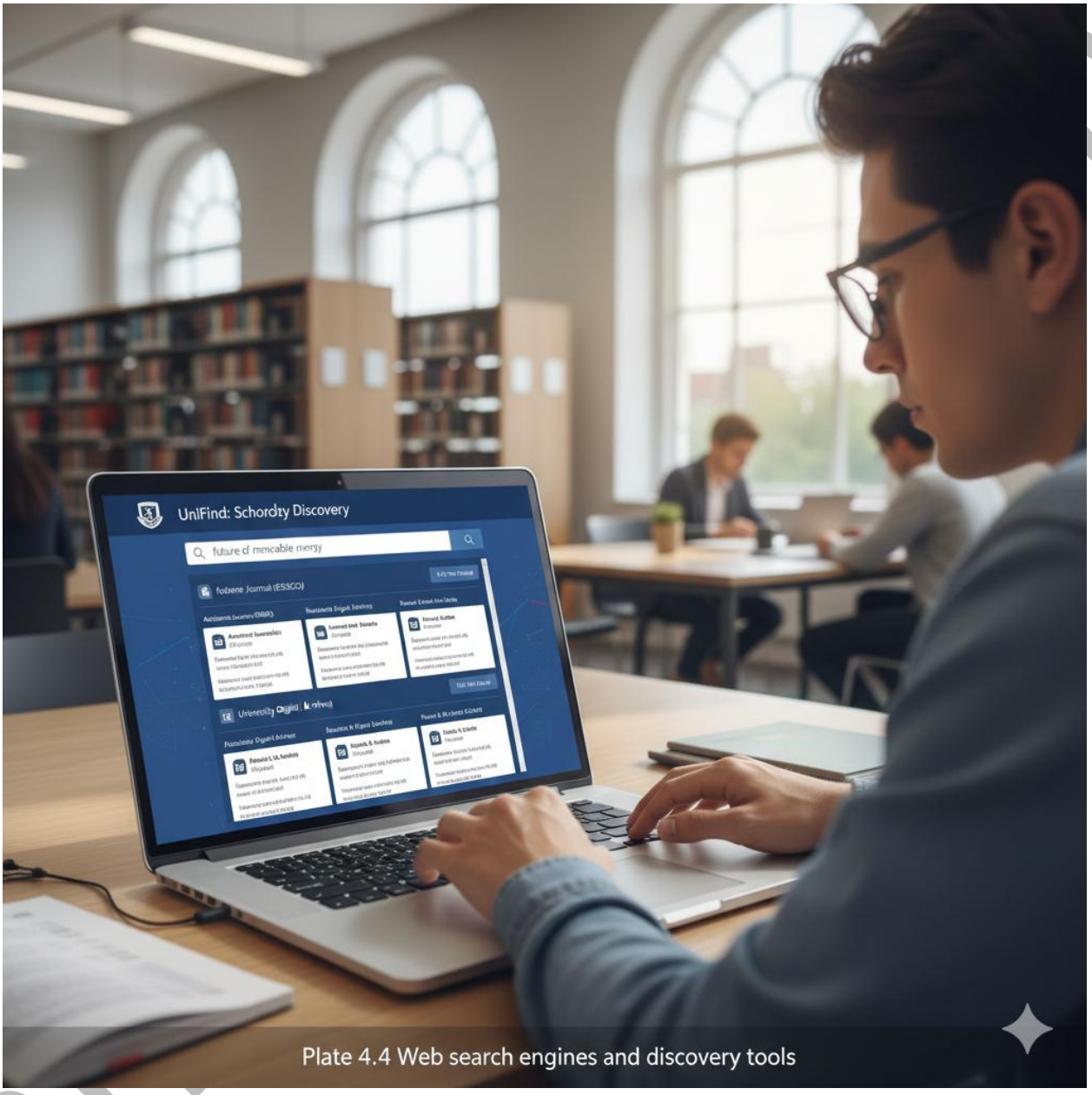


Plate 4.4 Web search engines and discovery tools

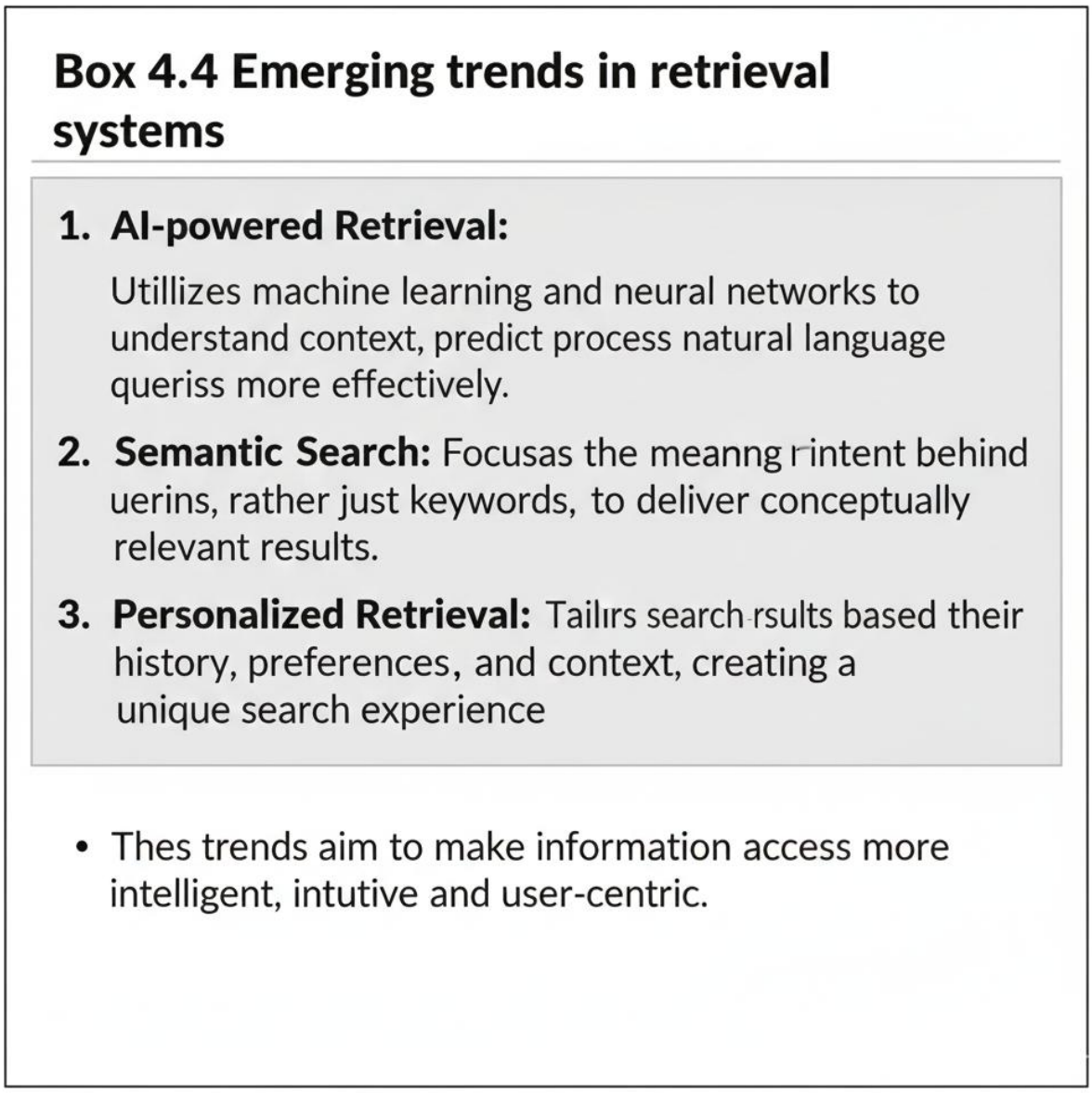
4.4.3 Emerging trends: AI, semantic search, and personalised retrieval

Emerging trends include:

- **Artificial intelligence (AI)**: Enhances retrieval by learning from user behaviour.
- **Semantic search**: Focuses on meaning rather than keywords, improving relevance.
- **Personalised retrieval**: Tailors results to individual preferences and contexts.

Fill in the blank:

- Semantic search focuses on _____ rather than keywords.



Box 4.4 Emerging trends in retrieval systems

1. **AI-powered Retrieval:**

   Utillizes machine learning and neural networks to understand context, predict process natural language queriss more effectively.

2. **Semantic Search:** Focusas the meanng rintent behind uerins, rather just keywords, to deliver conceptually relevant results.

3. **Personalized Retrieval:** Tailırs search rsults based their history, preferences, and context, creating a unique search experience

- Thes trends aim to make information access more intelligent, intutive and user-centric.

Pilot questions 4.4

1. What do digital libraries and academic databases provide access to?
2. What is the role of discovery tools?
3. Name one emerging trend in retrieval systems.
4. How does semantic search differ from keyword search?
5. Why is personalised retrieval important for users?

Series Summary [Series 4: Information Retrieval Systems]

This Series has explored how information retrieval systems enable users to locate and access information effectively, highlighting their relevance in both academic and everyday contexts. We began with the fundamentals, defining retrieval systems and examining their components and types. Building on this, we looked at search strategies and techniques, including Boolean operators, controlled vocabularies, and advanced methods such as truncation and filters. We then considered how retrieval systems are evaluated, focusing on precision, recall, relevance, ranking, and user satisfaction through usability testing. Finally, we examined practical applications in digital libraries, academic databases, and web search engines, before turning to emerging trends such as artificial intelligence, semantic search, and personalised retrieval.

By completing this Series, you should now be able to define and explain retrieval systems (SLO 4.1), apply effective search strategies (SLO 4.2), and evaluate system performance using precision, recall, and relevance (SLO 4.3 and SLO 4.4). You are also equipped to assess applications in different contexts (SLO 4.5) and examine how new technologies are shaping retrieval practices (SLO 4.6). These skills will enable you to use, evaluate, and adapt retrieval systems with confidence in both professional and academic environments.

Glossary of Terms

Academic databases Structured collections of scholarly information, often including journal articles, conference papers, and reports.

Artificial intelligence (AI) Technology that enables systems to learn from data and user behaviour to improve retrieval results.

Boolean operators Words such as AND, OR, and NOT used to combine or exclude search terms in queries.

Controlled vocabulary A standardised set of terms, such as subject headings or thesauri, used to ensure consistency in indexing and searching.

Digital libraries Online collections of books, articles, and other resources organised for structured access and retrieval.

Discovery tools Platforms that allow users to search across multiple databases or collections through a single interface.

Indexing The process of organising documents into searchable structures so they can be retrieved efficiently.

Information retrieval system A tool or platform that stores, organises, and retrieves information based on user queries.

Keyword searching A search method that relies on user-entered words or phrases to locate relevant documents.

Personalised retrieval Tailoring search results to individual preferences, contexts, or past behaviour.

Precision The proportion of retrieved documents that are relevant to the user's query.

lanetonline.com

Proximity searching A technique that finds words located within a certain distance of each other in documents.

Ranking Ordering search results so that the most relevant documents appear first.

Recall The proportion of relevant documents that are successfully retrieved by the system.

Relevance The degree to which retrieved documents match the user's information need.

Search engines Web-based systems that index and retrieve online content for users.

Subject searching Searching that uses controlled vocabulary terms rather than free keywords to improve precision.

Truncation A search technique that uses symbols (such as *) to find word variants, e.g., child* retrieves child, children, childhood.

Usability testing A method of evaluating systems by observing users as they interact with them to identify strengths and weaknesses.

User satisfaction A measure of how well users feel a retrieval system meets their information needs.

Concept Check Questions [Series 4]

Objective Questions

1. An information retrieval system stores, organises, and _____ information based on user queries. *(Linked to SLO 4.1)*
2. The three main components of retrieval systems are indexing, searching, and _____. *(Linked to SLO 4.1)*
3. The Boolean operator _____ is used to exclude records containing a specified term. *(Linked to SLO 4.2)*
4. Controlled vocabulary refers to a standardised set of _____ used in indexing. *(Linked to SLO 4.2)*
5. Precision measures the proportion of retrieved documents that are _____. *(Linked to SLO 4.3)*

Short-Answer Questions

6. Explain the purpose of an information retrieval system. *(Linked to SLO 4.1)*
7. Distinguish between keyword searching and subject searching. *(Linked to SLO 4.2)*
8. State one advantage of using truncation in advanced search techniques. *(Linked to SLO 4.2)*
9. Why is relevance important in evaluating retrieval systems? *(Linked to SLO 4.3)*
10. Identify one emerging trend in retrieval systems and briefly describe its impact. *(Linked to SLO 4.6)*

lanetonline.com

Long-Answer Questions

11. Analyse the strengths and limitations of using precision and recall as evaluation measures. *(Linked to SLO 4.3)*

12. Evaluate the role of usability testing in improving retrieval systems. *(Linked to SLO 4.4)*

13. Discuss the importance of controlled vocabulary in ensuring consistency and precision in retrieval. *(Linked to SLO 4.2)*

14. Assess how emerging trends such as AI and semantic search are shaping the future of retrieval systems. *(Linked to SLO 4.6)*

Answers to Concept Check Questions [Series 4]

Objective Questions

1. Retrieves.
2. Ranking.
3. NOT.
4. Terms.
5. Relevant.

Short-Answer Questions

6. Its purpose is to connect user queries with relevant documents, bridging large collections and user needs.

7. Keyword searching uses free words entered by the user, while subject searching relies on controlled vocabulary terms for consistency.

8. Truncation allows retrieval of word variants, increasing recall and saving time.

9. Relevance ensures that retrieved documents match the user's information need, improving efficiency and satisfaction.

10. Personalised retrieval tailors results to individual preferences, making searches more user-centred.

Long-Answer Questions

11. *Basic response:* Precision shows how many retrieved documents are relevant, while recall shows how many relevant documents are retrieved. *Value-added response:* Precision is useful for reducing irrelevant results, but high precision may lower recall. Recall ensures comprehensive retrieval, but high recall may include irrelevant items. Balancing both is critical for effective evaluation.

12. *Basic response:* Usability testing observes users interacting with systems to identify strengths and weaknesses. *Value-added response:* It provides insights into user behaviour, highlights design flaws, and informs improvements. Usability testing also supports iterative development, ensuring systems remain user-friendly and effective.

laenetonline.com

13. *Basic response:* Controlled vocabulary ensures consistent use of terms, improving precision in retrieval. *Value-added response:* It reduces ambiguity, supports interoperability across databases, and enhances search accuracy. However, it requires maintenance and may limit flexibility compared to free keyword searching.

14. *Basic response:* AI and semantic search improve retrieval by learning from user behaviour and focusing on meaning. *Value-added response:* AI enables personalised recommendations and adaptive systems, while semantic search enhances relevance by interpreting context. Together, they represent a shift towards intelligent, user-centred retrieval, though they raise challenges of privacy and resource demands.

Answers to Pilot Questions [Series 4]

Part 4.1 Fundamentals of Information Retrieval Systems

- To connect user queries with relevant documents.
- Indexing, searching, and ranking.
- Ranking orders results based on relevance.
- Examples include library catalogues, databases, and search engines.
- They are important because they help users access information efficiently.

Part 4.2 Search Strategies and Techniques

- AND, OR, NOT.
- NOT excludes records containing a specified term.
- A standardised set of terms used in indexing.
- Examples include Library of Congress Subject Headings (LCSH) and Medical Subject Headings (MeSH).
- Truncation, which retrieves word variants by using symbols such as *.

Part 4.3 Evaluation of Retrieval Systems

- Precision measures the proportion of retrieved documents that are relevant.
- Recall measures the proportion of relevant documents that are successfully retrieved.
- Relevance ensures that retrieved documents match the user's information need.
- Ranking places the most relevant documents first in search results.
- By observing users as they interact with the system.

Part 4.4 Applications and Emerging Trends

- Scholarly resources.
- They integrate multiple databases into a single search interface.
- Artificial intelligence, semantic search, or personalised retrieval.

laneonline.com

- Semantic search focuses on meaning rather than keywords.
- It provides tailored results that match individual preferences and contexts.

References and Attributions [Series 4]

General References

- Baeza-Yates, R., & Ribeiro-Neto, B. (2011). *Modern information retrieval: The concepts and technology behind search* (2nd ed.). Harlow: Addison-Wesley.
- Manning, C. D., Raghavan, P., & Schütze, H. (2008). *Introduction to information retrieval*. Cambridge: Cambridge University Press.
- Rowley, J., & Hartley, R. (2008). *Organising knowledge: An introduction to managing access to information* (4th ed.). Aldershot: Ashgate.
- International Federation of Library Associations and Institutions (IFLA). (2017). *Guidelines for subject access in national bibliographies*. The Hague: IFLA.
- International Organization for Standardization. (1996). *ISO 999: Guidelines for the content, organisation, and presentation of indexes*. Geneva: ISO.

Illustrations

Part 4.1 Fundamentals of Information Retrieval Systems

- *Figure 4.1 Definition and purpose of retrieval systems*: AI-generated using prompt "Generate a diagram showing the flow from user query to retrieval system to relevant documents." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "information retrieval system definition purpose diagram OER."
- *Box 4.1 Components of retrieval systems*: AI-generated using prompt "Generate a text box listing the three main components of retrieval systems: indexing, searching, ranking." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "components of information retrieval systems indexing searching ranking OER."
- *Plate 4.1 Types of retrieval systems*: AI-generated using prompt "Generate an image showing examples of a library catalogue, a scholarly database, and a web search engine." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "types of information retrieval systems library catalogue database search engine OER image."

Part 4.2 Search Strategies and Techniques

- *Figure 4.2 Boolean operators in searching*: AI-generated using prompt "Generate a diagram showing how Boolean operators (AND, OR, NOT) affect search results." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "Boolean operators keyword searching diagram OER."
- *Box 4.2 Controlled vocabulary examples*: AI-generated using prompt "Generate a text box listing examples of controlled vocabulary such as LCSH and MeSH." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "controlled vocabulary subject headings MeSH LCSH OER."

lanetonline.com

- *Plate 4.2 Advanced search techniques in practice*: AI-generated using prompt "Generate an image showing a user applying truncation and filters in a database search interface." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "advanced search techniques truncation proximity filters database OER image."

Part 4.3 Evaluation of Retrieval Systems

- *Figure 4.3 Precision and recall in retrieval evaluation*: AI-generated using prompt "Generate a diagram showing the relationship between precision and recall in evaluating search results." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "precision recall information retrieval evaluation diagram OER."
- *Box 4.3 Relevance and ranking in retrieval systems*: AI-generated using prompt "Generate a text box listing relevance and ranking as evaluation criteria in retrieval systems." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "relevance ranking evaluation retrieval systems OER."
- *Plate 4.3 User satisfaction and usability testing*: AI-generated using prompt "Generate an image showing a researcher conducting usability testing with a user interacting with a retrieval system." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "user satisfaction usability testing retrieval systems OER image."

Part 4.4 Applications and Emerging Trends

- *Figure 4.4 Retrieval in digital libraries and databases*: AI-generated using prompt "Generate a diagram showing retrieval in a digital library using metadata and subject headings." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "digital library academic database retrieval metadata OER diagram."
- *Plate 4.4 Web search engines and discovery tools*: AI-generated using prompt "Generate an image showing a user using a discovery tool that searches across multiple databases." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "web search engines discovery tools multiple databases OER image."
- *Box 4.4 Emerging trends in retrieval systems*: AI-generated using prompt "Generate a text box listing emerging trends in retrieval systems: AI, semantic search, personalised retrieval." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "emerging trends AI semantic search personalised retrieval OER."

- **Course code: LIS 413**
- **Course title: Indexing and Abstracting**
- **Course unit load: 2 Units**
- **Series list:**

1. Series 1: Basic Concepts of Indexing and Abstracting
2. Series 2: Methods and Techniques of Indexing and Abstracting
3. Series 3: Thesaurus Design and Updating
4. Series 4: Types of Indexes and Abstracts
5. Series 5: Indexing and Abstracting Services and Evaluation

lanetonline.com

Series 5: Bibliometrics and Scientometrics

Series Outline

For a 2-credit course, this Series will contain four Parts. It focuses on the measurement and analysis of scholarly communication, research impact, and scientific productivity.

- **Part 5.1 Fundamentals of Bibliometrics and Scientometrics**
  - 5.1.1 Definition and scope of bibliometrics and scientometrics
  - 5.1.2 Historical development and significance
  - 5.1.3 Key concepts: citations, impact, productivity
- **Part 5.2 Bibliometric Indicators and Tools**
  - 5.2.1 Citation counts and h-index
  - 5.2.2 Journal impact factor and alternative metrics
  - 5.2.3 Tools and databases for bibliometric analysis (e.g., Web of Science, Scopus, Google Scholar)
- **Part 5.3 Scientometric Methods and Applications**
  - 5.3.1 Mapping scientific fields and networks
  - 5.3.2 Co-citation and co-authorship analysis
  - 5.3.3 Applications in research evaluation and policy making
- **Part 5.4 Emerging Trends and Ethical Considerations**
  - 5.4.1 Altmetrics and social media impact
  - 5.4.2 Open science and data-driven metrics
  - 5.4.3 Ethical issues in bibliometric and scientometric evaluation

Introduction [Series 5: Bibliometrics and Scientometrics]

In the last Series, we explored information retrieval systems and how they enable users to access relevant resources effectively. Building on that foundation, we now turn to bibliometrics and scientometrics, which focus on measuring and analysing scholarly communication and scientific productivity. These approaches are increasingly important in understanding research impact, guiding academic evaluation, and shaping science policy. By studying them, you will gain insight into how knowledge is assessed and how scholarly influence is tracked across disciplines.

The aim of this Series is to introduce you to the principles, indicators, and methods of bibliometrics and scientometrics, and to equip you with the ability to apply these tools critically in evaluating research outputs and scientific activity.

We shall commence this Series by examining the fundamentals of bibliometrics and scientometrics, including their definitions, scope, and historical development. Next, we will explore bibliometric indicators and tools such as citation counts, the h-index, and journal impact factors, alongside alternative metrics. Following that, we will move on to scientometric methods and applications, including mapping scientific fields, co-citation analysis, and their role in research evaluation and policy. Finally, we will wrap up by considering emerging trends such as altmetrics, open science, and the ethical issues that arise in the use of bibliometric and scientometric measures.

Series Learning Outcomes

lanetonline.com

Upon completing this Series, you should be able to:

- **SLO 5.1** define and explain the scope, historical development, and significance of bibliometrics and scientometrics.
- **SLO 5.2** identify and apply bibliometric indicators such as citation counts, h-index, and journal impact factor.
- **SLO 5.3** evaluate the strengths and limitations of bibliometric tools and databases including Web of Science, Scopus, and Google Scholar.
- **SLO 5.4** analyse scientometric methods such as co-citation and co-authorship analysis, and explain their applications in mapping scientific fields.
- **SLO 5.5** assess the role of bibliometrics and scientometrics in research evaluation and policy making.
- **SLO 5.6** examine emerging trends such as altmetrics, open science, and data-driven metrics, and discuss ethical considerations in their use.

5.1 Fundamentals of Bibliometrics and Scientometrics

Bibliometrics and scientometrics provide systematic ways of measuring scholarly communication and scientific productivity. They help researchers, institutions, and policymakers understand the impact of publications, the growth of disciplines, and the dynamics of collaboration. In this Part, we will define these fields, trace their development, and introduce key concepts.

5.1.1 Definition and scope of bibliometrics and scientometrics

- **Bibliometrics** is the quantitative study of publications, citations, and patterns of scholarly communication.
- **Scientometrics** extends bibliometrics to measure and analyse scientific activity, productivity, and impact at broader levels.

Fill in the blank:

- Bibliometrics is the quantitative study of _____, citations, and patterns of scholarly communication.

lanetonline.com

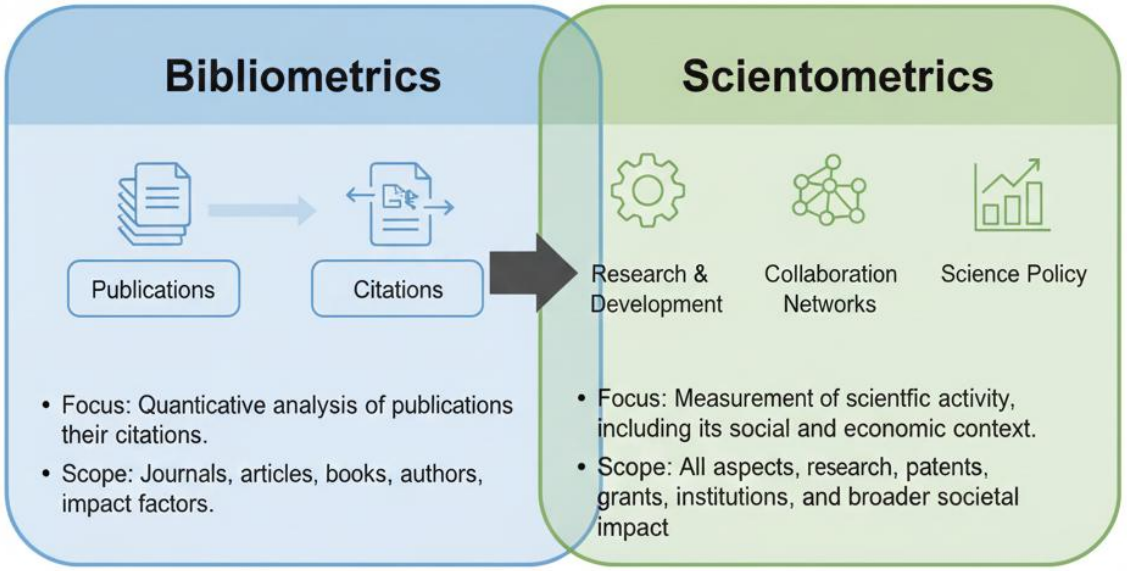


Figure 5.1 Definittion and biblonetrics and scientometrics

Illustrates how biblionetrics measures publications and citations, while scientmetrics a broader view of scientfic activity and is impact.

5.1.2 Historical development and significance

Bibliometrics emerged in the mid-20th century as scholars began to analyse citation patterns. Scientometrics developed alongside, focusing on measuring scientific progress and productivity. Both fields are now central to research evaluation and science policy.

Fill in the blank:

- Scientometrics developed to measure scientific _____ and productivity.

Box 5.1 Historical development milestones

- 1923: E. Wyndham Hulme uses "statstical bibligaical bibligaghy" to trace subject litertures.
- 1927: Affred J. Lotka publises Lotka's Law on author productivity
- 1948: S.R. Ranganathan coins the term "bibliometrics"
- 1955: Eugene Garfield founds the Institute of Scientifc Inserition (ISI).
- 1953: Publication of "Science Citation Index" (SCI). term "scientomerics"
- 1969: Vasili V. Nalimw and Robert Multschenko coin "scientometrics"
- 1970: Development of journal impact factor.
- 1880s-19903: Rise of computazed datbases (Web of Soience, Scopus).
- 2005: Jorge E. Hirsch proposes the h-index
- 2010s-Present: Growth of open science, big data, and new altmetric.

- This timeline highights key events and figures the fields of bibliontics and scientmetics.

5.1.3 Key concepts: citations, impact, productivity

- **Citations**: References to other works, used to measure influence.
- **Impact**: The significance or reach of a publication or researcher.
- **Productivity**: The volume of scholarly output, such as articles or books.

Fill in the blank:

- Citations are references to other works, used to measure _____.

[

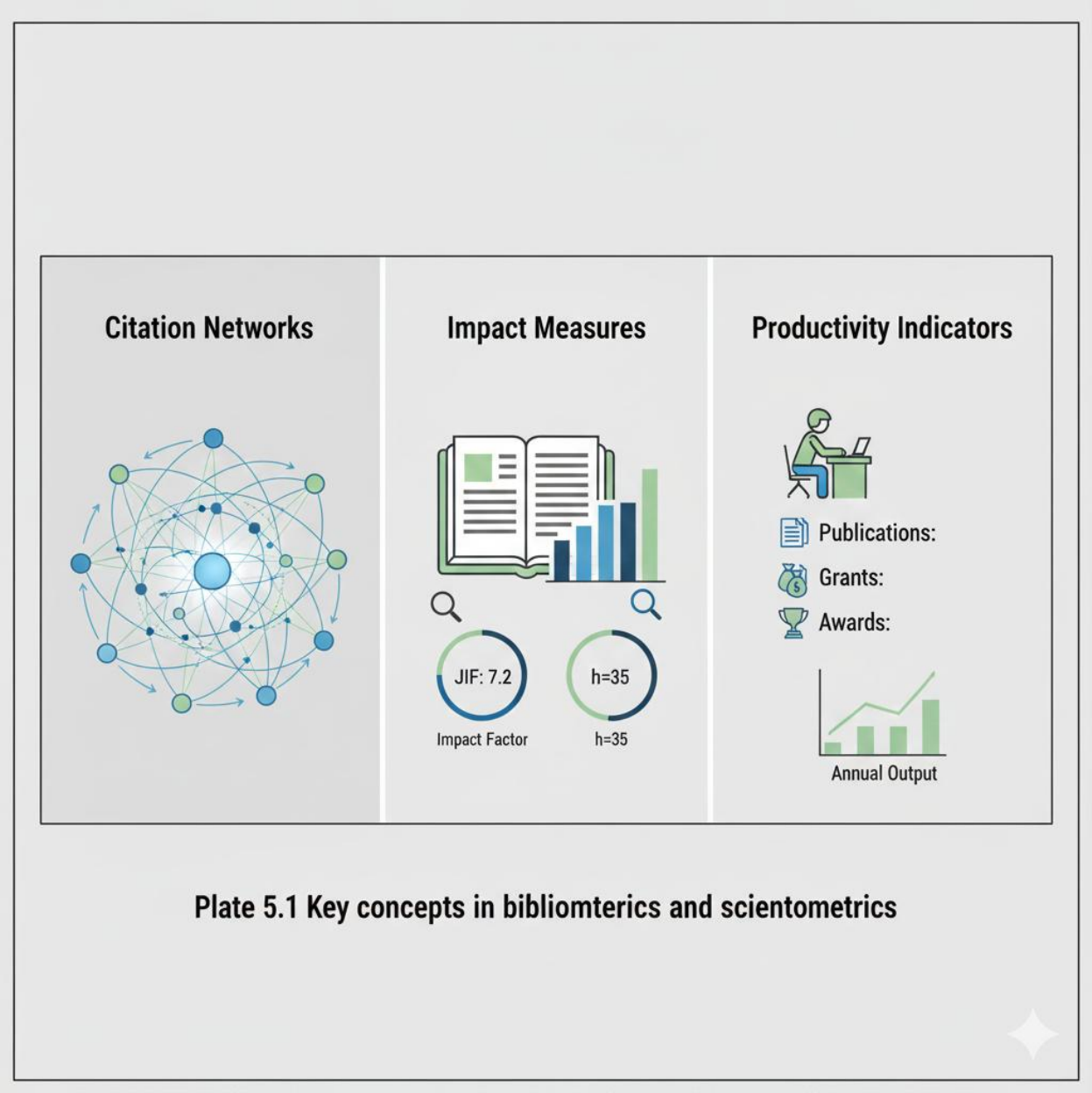


Plate 5.1 Key concepts in bibliomterics and scientometrics

Pilot questions 5.1

1. What is bibliometrics?
2. What is scientometrics?
3. When did bibliometrics emerge as a field of study?
4. What does scientometrics measure?
5. Name three key concepts in bibliometrics and scientometrics.

5.2 Bibliometric Indicators and Tools

Bibliometric indicators provide measurable ways of assessing scholarly output and influence. They are widely used in research evaluation, journal ranking, and academic decision-making. In this Part, we will explore common indicators, their applications, and the tools that support bibliometric analysis.

5.2.1 Citation counts and h-index

- **Citation counts** measure how often a publication is referenced by other works.
- **h-index** combines productivity and citation impact, showing the number of papers (h) that have received at least h citations.

Fill in the blank:

- The h-index combines productivity and _____ impact.

lanetonline.com

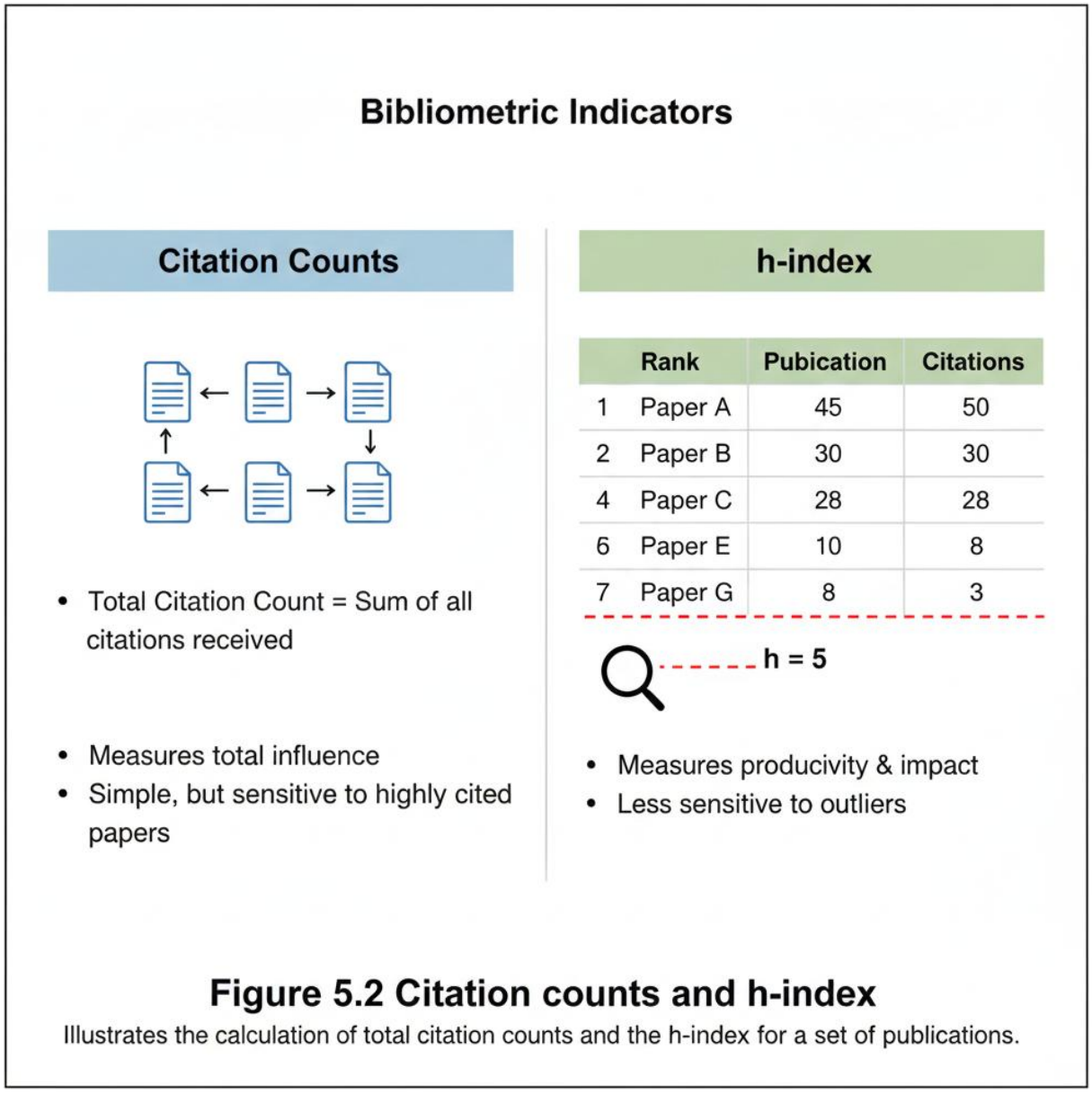


Figure 5.2 Citation counts and h-index

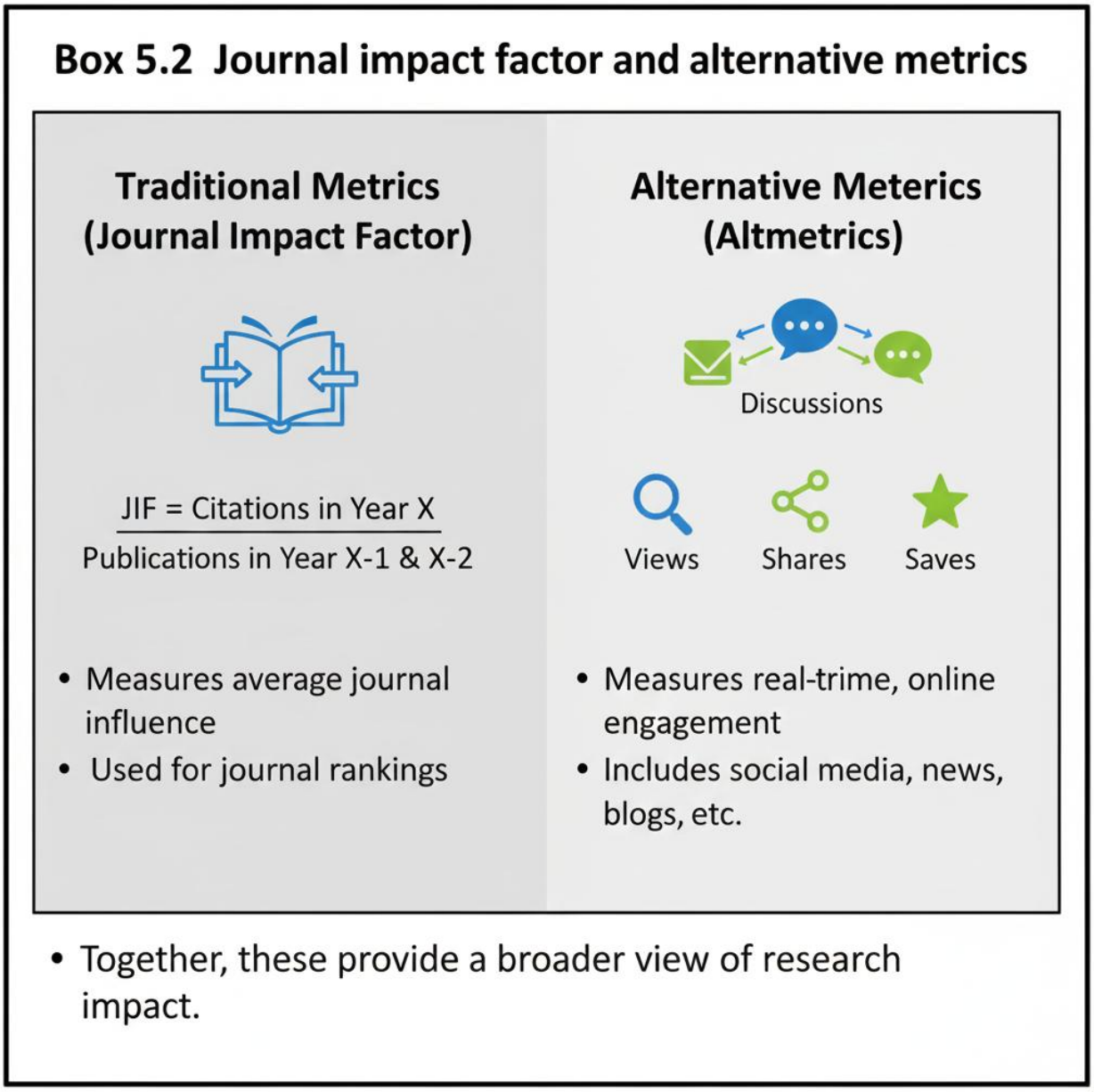
Illustrates the calculation of total citation counts and the h-index for a set of publications.

5.2.2 Journal impact factor and alternative metrics

- **Impact factor** measures the average number of citations received per paper published in a journal during a specific period.
- **Alternative metrics (altmetrics)** track online attention such as social media mentions, downloads, and shares.

Fill in the blank:

- Impact factor measures the average number of _____ received per paper in a journal.



5.2.3 Tools and databases for bibliometric analysis

Common tools include:

- **Web of Science**: A multidisciplinary citation database.
- **Scopus**: A large abstract and citation database covering diverse disciplines.
- **Google Scholar**: A freely accessible search engine for scholarly literature.

Fill in the blank:

- Scopus is a large abstract and _____ database covering diverse disciplines.

Plate 5.2 Tools and databases for bibliometric analysis

Pilot questions 5.2

1. What does citation count measure?
2. What does the h-index combine?
3. What does impact factor measure?
4. What are altmetrics used to track?
5. Name one tool or database used for bibliometric analysis.

5.3 Scientometric Methods and Applications

Scientometric methods provide tools for analysing the structure and dynamics of science. They help map scientific fields, identify collaboration networks, and evaluate research performance. In this Part, we will explore key methods and their applications.

5.3.1 Mapping scientific fields and networks

Scientometric analysis often involves mapping disciplines and research areas to show how knowledge is organised. Network visualisations reveal connections between authors, institutions, and topics.

Fill in the blank:

- Mapping scientific fields shows how _____ is organised across disciplines and research areas.

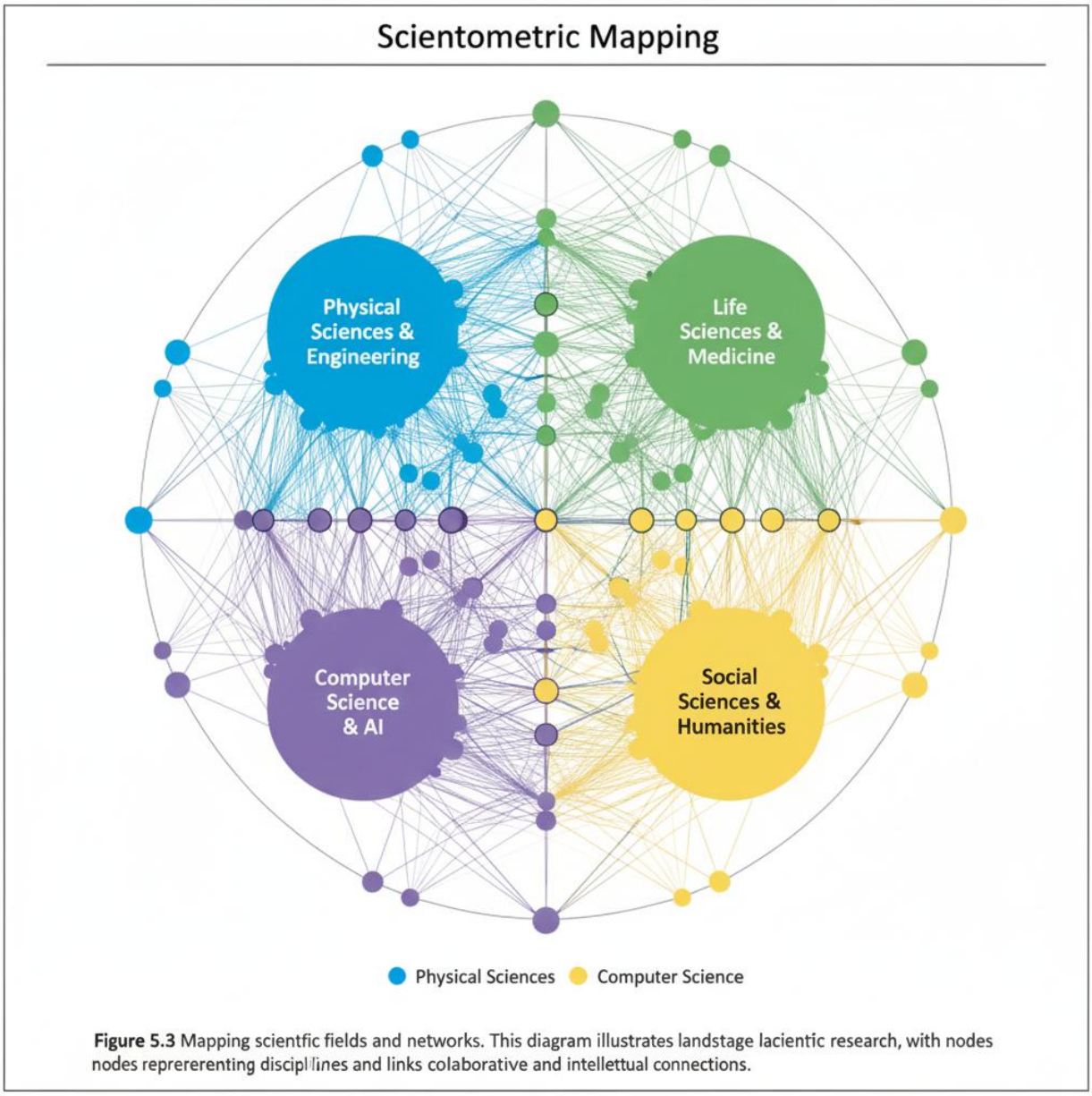


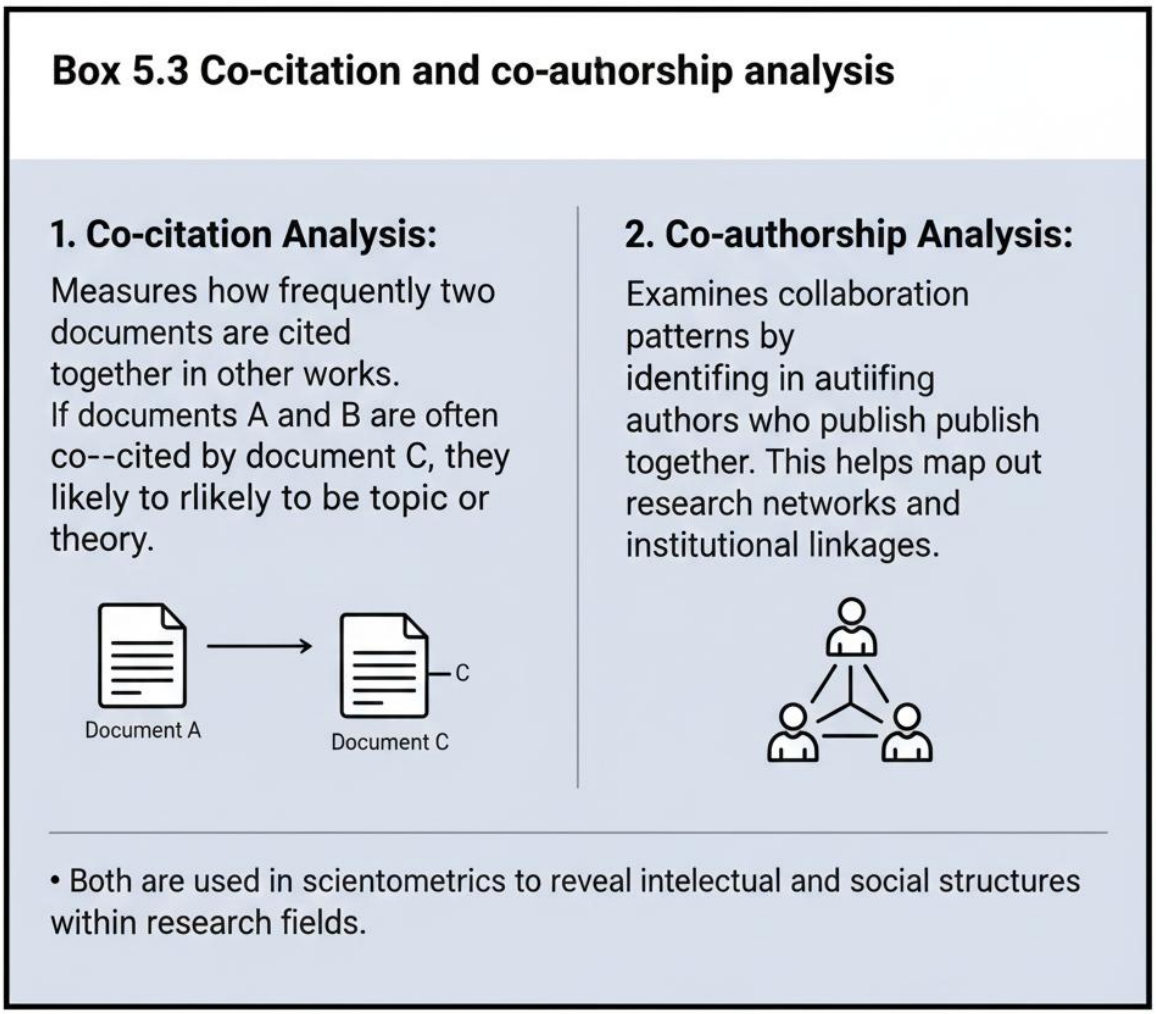
Figure 5.3 Mapping scientfic fields and networks. This diagram illustrates landstage lacientic research, with nodes nodes reprererenting discipl lines and links colaborative and intellettual connections.

5.3.2 Co-citation and co-authorship analysis

- **Co-citation analysis** examines how often two documents are cited together, revealing relationships between research topics.
- **Co-authorship analysis** studies collaboration patterns among researchers, institutions, or countries.

Fill in the blank:

- Co-citation analysis reveals relationships between _____ topics.



Box 5.3 Co-citation and co-authorship analysis

5.3.3 Applications in research evaluation and policy making

Scientometric methods are applied to:

- Evaluate research performance at individual, institutional, or national levels.

- Identify emerging fields and trends.
- Inform science policy and funding decisions.

Fill in the blank:

- Scientometric methods can inform science _____ and funding decisions.

Plate 5.3 Applications in research evaluation and policy making

Pilot questions 5.3

1. What does mapping scientific fields reveal?
2. What is co-citation analysis?
3. What is co-authorship analysis?
4. Give one application of scientometric methods.

5. How can scientometrics support policy making?

5.4 Emerging Trends and Ethical Considerations

Bibliometrics and scientometrics continue to evolve as new technologies and practices reshape scholarly communication. This Part highlights emerging trends such as altmetrics and open science, while also addressing ethical issues in the use of metrics.

5.4.1 Altmetrics and social media impact

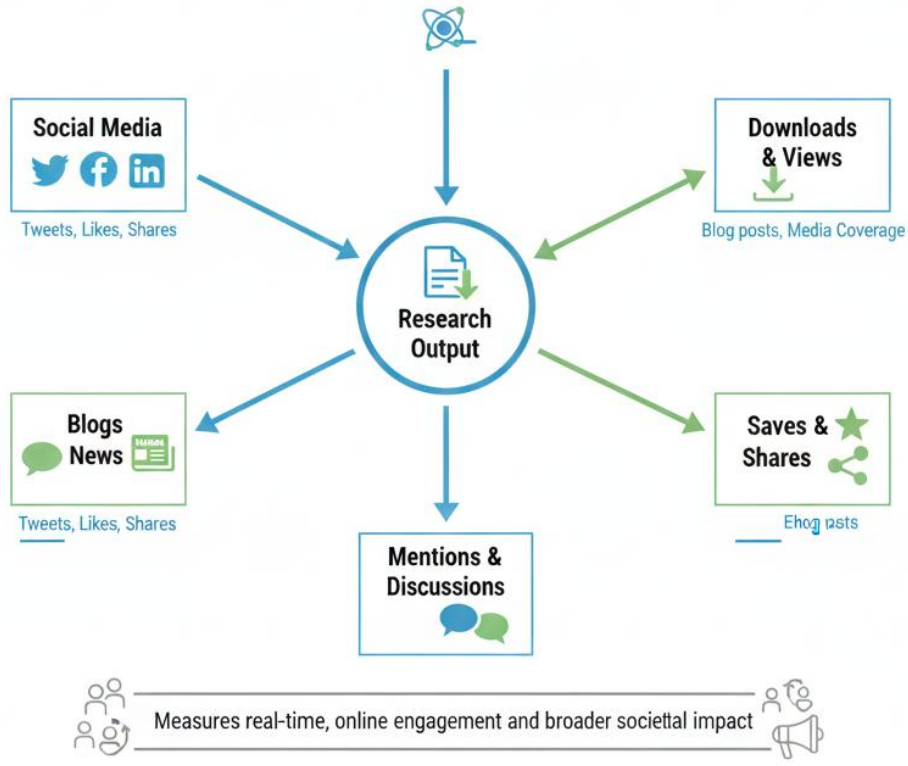
Altmetrics measure online attention beyond traditional citations, including social media mentions, downloads, and news coverage. They provide a broader view of research influence in digital environments.

Fill in the blank:

- Altmetrics measure online attention beyond traditional _____.

lanetonline.com

Figure 5.4 Altmetrics and social media impact



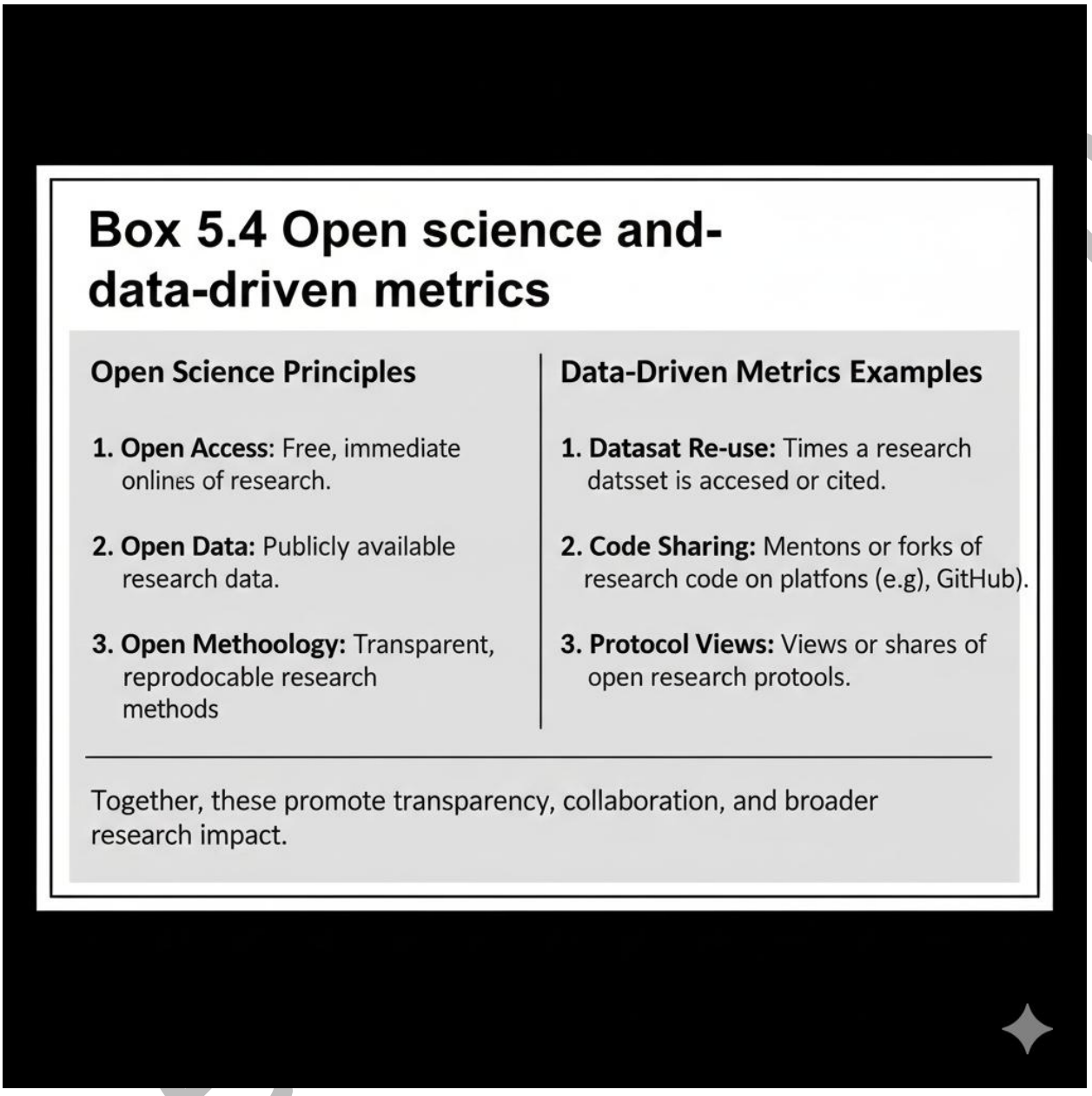
This diagram illustraties various online sources that contribute to the altmetrics score of a publication, publication, capturing its social and web impact.

5.4.2 Open science and data-driven metrics

Open science promotes transparency, accessibility, and collaboration in research. Data-driven metrics use large datasets to provide richer insights into scientific activity and impact.

Fill in the blank:

- Open science promotes transparency, accessibility, and _____ in research.



5.4.3 Ethical issues in bibliometric and scientometric evaluation

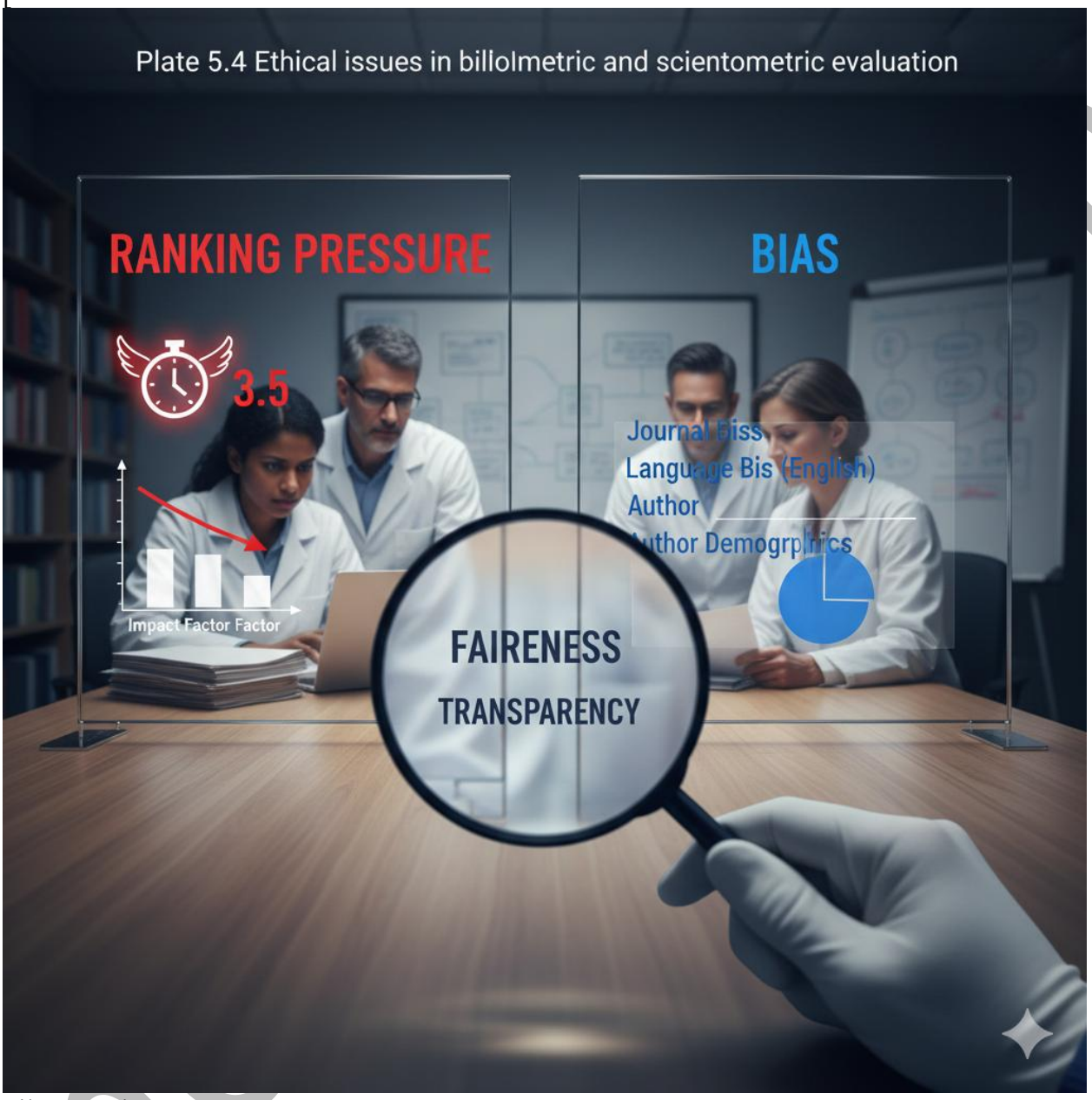
Ethical concerns include:

- Misuse of metrics for ranking without context.
- Pressure on researchers to maximise indicators rather than quality.
- Biases in databases and unequal visibility of disciplines.

Fill in the blank:

- Misuse of metrics for _____ without context is an ethical concern.

[



Pilot questions 5.4

1. What do altmetrics measure?
2. What does open science promote?
3. What are data-driven metrics?
4. Name one ethical concern in bibliometric evaluation.
5. Why is it important to consider ethics in scientometrics?

Series Learning Outcomes [Series 5: Bibliometrics and Scientometrics]

Upon completing this Series, you should be able to:

- **SLO 5.1** define bibliometrics and scientometrics as fields of study in scholarly communication,
- **SLO 5.2** explain the historical development and significance of bibliometrics and scientometrics,
- **SLO 5.3** identify key concepts such as citations, impact, and productivity in bibliometric analysis,
- **SLO 5.4** calculate citation counts and h-index as measures of scholarly output,
- **SLO 5.5** evaluate journal impact factor and alternative metrics for assessing research influence,
- **SLO 5.6** demonstrate the use of bibliometric tools and databases such as Web of Science, Scopus, and Google Scholar,
- **SLO 5.7** analyse scientometric methods including co-citation and co-authorship analysis,
- **SLO 5.8** assess applications of scientometric methods in research evaluation and policy making,
- **SLO 5.9** describe emerging trends such as altmetrics and open science in scholarly communication, and
- **SLO 5.10** discuss ethical issues associated with bibliometric and scientometric evaluation.

Series Summary [Series 5: Bibliometrics and Scientometrics]

This Series has introduced you to the measurement and analysis of scholarly communication and scientific productivity, highlighting their importance in research evaluation and policy making. We began with the fundamentals, defining bibliometrics and scientometrics, tracing their historical development, and identifying key concepts such as citations, impact, and productivity. Then we explored bibliometric indicators including citation counts, h-index, and journal impact factor, alongside alternative metrics and the tools used for analysis such as Web of Science, Scopus, and Google Scholar. Moving on, we examined scientometric methods such as mapping scientific fields, co-citation, and co-authorship analysis, before considering their applications in evaluating research and guiding policy. Finally, we discussed emerging trends including altmetrics and open science, and reflected on ethical issues in the use of metrics.

By completing this Series, you should now be able to define and explain bibliometrics and scientometrics (SLO 5.1, SLO 5.2), identify and apply key indicators (SLO 5.3, SLO 5.4, SLO 5.5), and demonstrate the use of bibliometric tools (SLO 5.6). You are also equipped to analyse scientometric methods and assess their applications (SLO 5.7, SLO 5.8), as well as describe emerging trends and discuss ethical considerations (SLO 5.9, SLO 5.10). These outcomes ensure you can critically engage with bibliometric and scientometric practices, applying them responsibly in academic and professional contexts.

laneonline.com

Glossary of Terms [Series 5: Bibliometrics and Scientometrics]

Altmetrics Alternative metrics that measure online attention to research outputs, including social media mentions, downloads, and news coverage.

Bibliometrics The quantitative study of publications, citations, and patterns of scholarly communication.

Citation counts A measure of how often a publication is referenced by other works.

Co-authorship analysis A scientometric method that examines collaboration patterns among researchers, institutions, or countries.

Co-citation analysis A scientometric method that studies how often two documents are cited together, revealing relationships between topics.

Google Scholar A freely accessible search engine for scholarly literature, often used for citation tracking.

h-index An indicator that combines productivity and citation impact, showing the number of papers (h) with at least h citations.

Impact factor A measure of the average number of citations received per paper published in a journal during a specific period.

Open science A movement promoting transparency, accessibility, and collaboration in research practices.

Productivity The volume of scholarly output, such as articles, books, or conference papers.

Scientometrics The study of measuring and analysing scientific activity, productivity, and impact at broader levels.

Scopus A large abstract and citation database covering diverse disciplines.

User satisfaction (in metrics use) The degree to which researchers and institutions feel bibliometric and scientometric measures meet their evaluation needs.

Web of Science A multidisciplinary citation database widely used for bibliometric analysis.

Concept Check Questions [Series 5]

Objective Questions

1. Bibliometrics is the quantitative study of _____. *(Linked to SLO 5.1)*
2. Scientometrics measures scientific activity, productivity, and _____. *(Linked to SLO 5.1)*
3. The h-index combines productivity and _____ impact. *(Linked to SLO 5.4)*
4. Impact factor measures the average number of _____ received per paper in a journal. *(Linked to SLO 5.5)*

lanetonline.com

5. Altmetrics track online attention such as social media mentions, downloads, and _____. *(Linked to SLO 5.9)*

Short-Answer Questions

6. Explain the difference between bibliometrics and scientometrics. *(Linked to SLO 5.1)*

7. State one milestone in the historical development of bibliometrics. *(Linked to SLO 5.2)*

8. Identify one key concept used in bibliometric analysis. *(Linked to SLO 5.3)*

9. Name one tool or database commonly used for bibliometric analysis. *(Linked to SLO 5.6)*

10. Give one ethical concern associated with bibliometric evaluation. *(Linked to SLO 5.10)*

Long-Answer Questions

11. Analyse the strengths and limitations of citation counts and h-index as bibliometric indicators. *(Linked to SLO 5.4)*

12. Evaluate the usefulness of journal impact factor compared to altmetrics in assessing research influence. *(Linked to SLO 5.5, SLO 5.9)*

13. Discuss how co-citation and co-authorship analysis can be applied to map scientific fields and collaboration networks. *(Linked to SLO 5.7)*

14. Assess the role of scientometric methods in informing research evaluation and policy making. *(Linked to SLO 5.8)*

15. Examine the ethical challenges posed by the misuse of bibliometric and scientometric measures. *(Linked to SLO 5.10)*

Answers to Concept Check Questions [Series 5]

Objective Questions

1. Publications.
2. Impact.
3. Citation.
4. Citations.
5. Shares.

Short-Answer Questions

6. Bibliometrics focuses on publications and citations, while scientometrics extends to measuring scientific activity and productivity.

7. The emergence of citation analysis in the mid-20th century.

8. Citations, impact, or productivity.

9. Web of Science, Scopus, or Google Scholar.

laetonline.com

10. Misuse of metrics for ranking without context.

Long-Answer Questions

11. *Basic response:* Citation counts show how often a work is referenced, while h-index combines productivity and citation impact. *Value-added response:* Citation counts are simple but can be skewed by highly cited papers. The h-index balances productivity and impact but disadvantages early-career researchers and varies across disciplines.

12. *Basic response:* Impact factor measures average citations per paper, while altmetrics track online attention. *Value-added response:* Impact factor is useful for journal ranking but limited to citations. Altmetrics capture broader influence, including social media and downloads, but may reflect popularity rather than scholarly quality.

13. *Basic response:* Co-citation analysis shows relationships between topics, while co-authorship analysis reveals collaboration patterns. *Value-added response:* Together, they map scientific fields and networks, highlighting emerging areas and collaboration trends. They can inform institutional strategies and interdisciplinary research.

14. *Basic response:* Scientometric methods evaluate research performance and identify trends. *Value-added response:* They support evidence-based policy making by guiding funding, identifying strengths and weaknesses, and shaping national research priorities.

15. *Basic response:* Misuse of metrics can lead to unfair rankings and pressure on researchers. *Value-added response:* Ethical challenges include database biases, neglect of disciplinary diversity, and prioritising quantity over quality. Addressing these requires responsible use of metrics and contextual interpretation.

Answers to Pilot Questions [Series 5]

Part 5.1 Fundamentals of Bibliometrics and Scientometrics

- Bibliometrics is the quantitative study of publications, citations, and patterns of scholarly communication.
- Scientometrics measures scientific activity, productivity, and impact.
- Bibliometrics emerged in the mid-20th century.
- Scientometrics measures scientific progress and productivity.
- Key concepts include citations, impact, and productivity.

Part 5.2 Bibliometric Indicators and Tools

- Citation counts measure how often a publication is referenced by other works.
- The h-index combines productivity and citation impact.
- Impact factor measures the average number of citations received per paper in a journal.
- Altmetrics track online attention such as social media mentions, downloads, and shares.
- Tools include Web of Science, Scopus, and Google Scholar.

lanetonline.com

Part 5.3 Scientometric Methods and Applications

- Mapping scientific fields reveals how knowledge is organised across disciplines.
- Co-citation analysis examines how often two documents are cited together.
- Co-authorship analysis studies collaboration patterns among researchers.
- Applications include evaluating research performance and identifying emerging fields.
- Scientometrics supports policy making by informing funding and research priorities.

Part 5.4 Emerging Trends and Ethical Considerations

- Altmetrics measure online attention beyond traditional citations.
- Open science promotes transparency, accessibility, and collaboration.
- Data-driven metrics use large datasets to provide richer insights.
- Ethical concerns include misuse of metrics for ranking without context.
- Ethics are important to ensure fairness and responsible use of bibliometric measures.

References and Attributions [Series 5]

General References

- Borgman, C. L., & Furner, J. (2002). Scholarly communication and bibliometrics. *Annual Review of Information Science and Technology*, 36(1), 3–72.
- Egghe, L., & Rousseau, R. (1990). *Introduction to informetrics: Quantitative methods in library, documentation and information science*. Amsterdam: Elsevier.
- Moed, H. F. (2005). *Citation analysis in research evaluation*. Dordrecht: Springer.
- Thelwall, M., Haustein, S., Larivière, V., & Sugimoto, C. R. (2013). Do altmetrics work? *Journal of the Association for Information Science and Technology*, 65(3), 201–214.
- Waltman, L. (2016). A review of the literature on citation impact indicators. *Journal of Informetrics*, 10(2), 365–391.

Illustrations

Part 5.1 Fundamentals of Bibliometrics and Scientometrics

- *Figure 5.1 Definition and scope of bibliometrics and scientometrics*: AI-generated using prompt “Generate a diagram showing bibliometrics focusing on publications and citations, and scientometrics extending to scientific activity.” Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: “bibliometrics scientometrics definition scope diagram OER.”
- *Box 5.1 Historical development milestones*: AI-generated using prompt “Generate a text box listing milestones in the historical development of bibliometrics and scientometrics.” Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: “history of bibliometrics scientometrics milestones OER.”

laneronline.com

- *Plate 5.1 Key concepts in bibliometrics and scientometrics*: AI-generated using prompt "Generate an image showing citation networks, impact measures, and productivity indicators." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "citations impact productivity bibliometrics scientometrics OER image."

Part 5.2 Bibliometric Indicators and Tools

- *Figure 5.2 Citation counts and h-index*: AI-generated using prompt "Generate a diagram showing how citation counts and h-index are calculated." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "citation counts h-index bibliometrics diagram OER."
- *Box 5.2 Journal impact factor and alternative metrics*: AI-generated using prompt "Generate a text box listing traditional and alternative metrics such as impact factor and altmetrics." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "journal impact factor altmetrics bibliometrics OER."
- *Plate 5.2 Tools and databases for bibliometric analysis*: AI-generated using prompt "Generate an image showing logos or interfaces of Web of Science, Scopus, and Google Scholar." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "Web of Science Scopus Google Scholar bibliometric tools OER image."

Part 5.3 Scientometric Methods and Applications

- *Figure 5.3 Mapping scientific fields and networks*: AI-generated using prompt "Generate a diagram showing a network map of scientific fields with nodes representing disciplines and links showing connections." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "scientometric mapping scientific fields networks diagram OER."
- *Box 5.3 Co-citation and co-authorship analysis*: AI-generated using prompt "Generate a text box listing definitions of co-citation analysis and co-authorship analysis." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "co-citation co-authorship analysis scientometrics OER."
- *Plate 5.3 Applications in research evaluation and policy making*: AI-generated using prompt "Generate an image showing policymakers using scientometric data to guide funding and research priorities." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "applications scientometrics research evaluation policy making OER image."

Part 5.4 Emerging Trends and Ethical Considerations

- *Figure 5.4 Altmetrics and social media impact*: AI-generated using prompt "Generate a diagram showing altmetrics sources such as social media, blogs, and downloads." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "altmetrics social media impact bibliometrics OER diagram."
- *Box 5.4 Open science and data-driven metrics*: AI-generated using prompt "Generate a text box listing principles of open science and examples of data-driven metrics." Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: "open science data-driven metrics bibliometrics OER."

lanetonline.com

- *Plate 5.4 Ethical issues in bibliometric and scientometric evaluation*: AI-generated using prompt “Generate an image showing ethical dilemmas in bibliometric evaluation, such as ranking pressure and bias.” Tool/platform: Microsoft Copilot Image Gen. Suggested OER search string: “ethical issues bibliometric scientometric evaluation OER image.”

lanetonline.com