



Boolean Meets Smart Search: AI's Role in the Future of Research

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Session Outline

1. Introduction and Disclosure
2. Search Query: Keyword, NLP, Semantic
3. Live Demo (LLMs, Vendor Tools, NotebookLM)
4. How to Introduce AI Usage for Query Search Strategy
5. Conclusion and Q&A

Introduction and Disclosure



Search Query: Keyword, NLP, Semantic

- Keyword – Relies on exact word matching.
- Natural Language Processing (NLP) – Analyze text to make a clean query using original text.
- Semantic – Focuses on the meaning of the words using NLP to create enhanced queries.
- Elasticsearch Query String - lightweight method for performing full-text searches across multiple fields using a single query string
- Example of Databases using semantic searching
 - Web of Science Smart Search
 - Primo VE Research Assistant
 - Scopus AI

Semantic – WoS Smart Search

- **Query Process**

- Not clear
- Not easy to edit

- Example NLP question: “What is the impact of climate change on the US economy?”

- See how we processed your query

We searched for **TS=(what is the impact of climate change on the us economy)**

- Topic Search - searches the title, abstract and author keywords within a record using the exact question.
- Backend process is not clear to the user.

Semantic –Primo VE Research Assistant

- **Query Process**

- Process is not clearly displayed
- Can edit using the advanced search

- Example NLP question: "What is the **impact** of **climate change** on the **US economy**?"

- View more results...

- (impact of climate change on US economy) OR (climate change **economic effects**) OR (US economy climate change **consequences**) OR ((climate change) OR (economic impact US)) OR ((climate change) AND (**economic growth** US)) OR ("impact of climate change on US economy") OR (climate change economic effects United States) OR (((climate change) OR (global warming) AND (economic impact) OR (**financial** consequences) AND US)) OR (climate **adaptation** economic **costs** United States) OR (**environmental change** economic resilience US) OR (what is the impact of climate change on the US economy)

Semantic –Scopus AI

- **Query Process**

- Process is clearly displayed
- Not able to edit, relies in Chat style UI to enhance search
- Example NLP question: "What is the **impact** of **climate change** on the **US economy**?"
- Performing keyword search:
 - ("climate change" OR "**global warming**" OR "environmental change" OR "climatic shifts") AND ("US economy" OR "United States economy" OR "economic impact" OR "economic effects") AND ("financial" OR "economic" OR "monetary" OR "fiscal") AND ("agriculture" OR "industry" OR "**infrastructure**" OR "**employment**") AND ("**adaptation**" OR "mitigation" OR "**resilience**" OR "**vulnerability**")

Elasticsearch – Scite.ai

- **Query Support**

- Supports basic search
- Supports advanced search
- Supports Elasticsearch Query String

- Examples: “What is the impact of climate change on the US economy?”
 - **Basic:** “Climate Change” AND impact AND US Economy
 - **Elastic:** Query"climate change" AND ("US economy" OR "American economy" OR "national economy") AND (impact OR effect OR cost OR financial OR GDP)
 - **Field specific:** abstract:("climate change" AND (impact OR cost) AND ("US economy" OR GDP))



Live Demo



ChatGPT – AI Search Query Examples

- **Search Query Creation**

<https://chatgpt.com/share/68f1cbe7-2c1c-8007-ae9f-afad82f47a57>

- **Advanced PubMed Search Query**

<https://chatgpt.com/share/68f1cab5-9274-8007-9c5a-cc990d116481>

- **Web of Science Query**

<https://chatgpt.com/share/68f1cadd-21b8-8007-9892-f60616d968ab>

- **IEEE Xplore Search Query**

<https://chatgpt.com/share/68f1ca9c-624c-8007-9942-52222e3047f6>

Gemini and NotebookLM – AI Search Query Examples

- **Crafting Elasticsearch Climate Change Query**
<https://gemini.google.com/share/baaed7fd742c>
- **NotebookLM - AI Tools and the Systematic Search Process: A Librarian's Assessment**
<https://notebooklm.google.com/notebook/06ff170e-0688-4912-9525-5119b509862c>
- **NotebookLM - Social Media's Impact on Mental Health**
<https://notebooklm.google.com/notebook/ef24ce9d-983b-47ae-84ef-015685924bca>

Claude – AI Search Query Examples

- **Search Query Creation**

<https://claude.ai/share/5b13e4dd-641b-4570-88cf-f9cdf19fda00>

- **Advanced PubMed Search Query**

<https://claude.ai/share/d6a10ecc-fd6b-413c-b2e7-780d080a4fdb>

- **Web of Science Advanced Search Query**

<https://claude.ai/share/fe422523-79bc-4e6b-b984-c6c2ff772a34>

- **IEEE Xplore Advanced Search Query Guide**

<https://claude.ai/share/08317c65-e55a-4a90-9332-72e0479c4bc4>

How to Introduce AI Usage for Query Search Strategy

- Avoid the **Google Effect** from the start. Sparrow, B., Liu, J., & Wegner, D. M. (2011). *Google effects on memory*. Science, 333, 776–778.
 - Remind students that the AI tools should be used to help create a strategy plan, not a replacement and a crutch for advanced search.
- Use traditional examples to illustrate the complexity of Keyword/Boolean queries.
- Gradually introduce the use of AI and NLP to generate queries.
- Use unique search-field descriptor from databases beyond the basics.
- Create activities that help students engage with AI versus One-and-Done exercises. Examples activities/ prompts:
 - “Create a query strategy for the follow question XXX”
 - “Show me the steps used to create the strategy plan”
 - “Provide me with key points to remember”

Tips for Librarians

- Create projects with chat examples
 - Canned chats load faster and are easier to share.
 - ChatGPT and Claude allow you to create **project folders** which allow you to save chats easier.
 - Google Gemini allows you to share chats and use other methods to organize and save.
- Use examples that show the limitations of AI
- Use live examples including topic questions from students
- Use both AI and databases advanced search together
 - Avoid creating a sense of reliance on AI over database advanced searching.
 - Include opportunities for students to improve AI generated queries using advanced search

Further Reading

- Bourgeois, J. P., & Ellingson, H. (2025). Ability of ChatGPT to Generate Systematic Review Search Strategies Compared to a Published Search Strategy. *Medical Reference Services Quarterly*, 44(3), 279–291.
<https://doi.org/10.1080/02763869.2025.2537075>
- Park, S. G. (2025). AI and Systematic Reviews: Can AI Tools Replace Librarians in the Systematic Search Process? *Science & Technology Libraries (New York, N.Y.)*, 1–22.
<https://doi.org/10.1080/0194262X.2025.2521519>
- Reed, R. B., & Barnett, D. J. (2025). Assessing the Quality of Biomedical Boolean Search Strings Generated by Prompted and Unprompted Models Using ChatGPT: A Pilot Study. *Medical Reference Services Quarterly*, 44(1), 31–40.
<https://doi.org/10.1080/02763869.2024.2440848>

Thank you!
Q and A?

Disclaimer: Artificial intelligence tools were used to assist in outlining and refining the presentation text. All content has been reviewed and approved by the author for accuracy and clarity.



Image generated by Google Gemini

Prompt: "A male Latino librarian giving a lecture to a group of graduate students learning about AI"