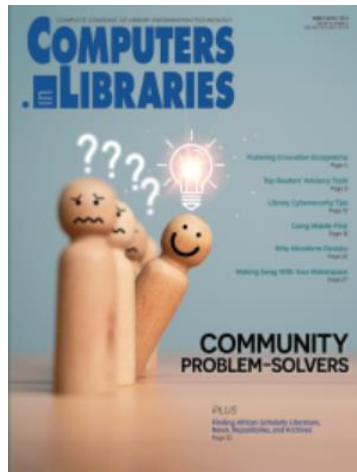


Search is Evolving: Are the Searchers?

Marydee Ojala

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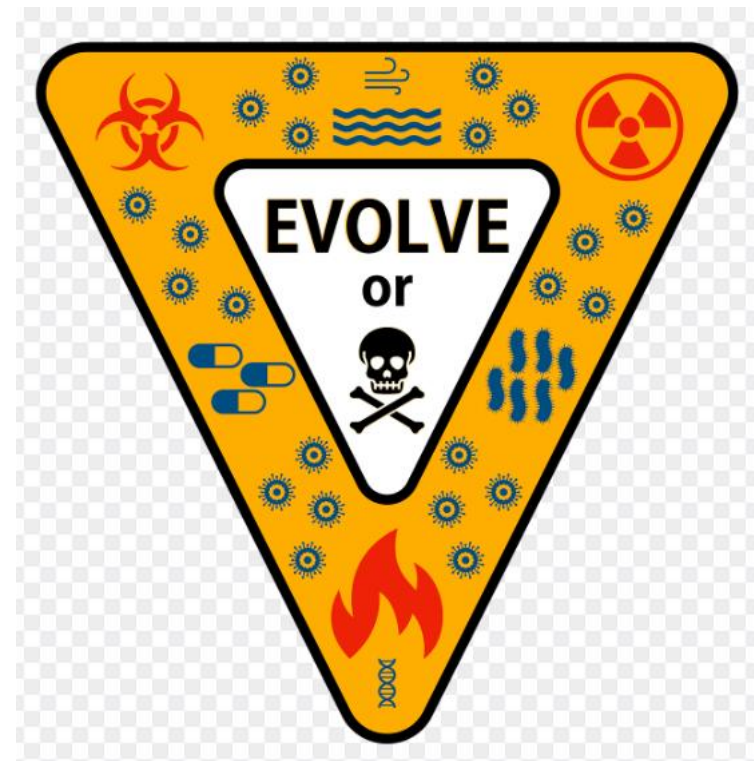


Introduction

- Editor, Online Searcher section Computers in Libraries (infotoday.com/cilmag)
- Editor, ILI365 Newsletter (infotoday.eu)
- Editor-in-Chief, KMWorld (kmworld.com)
- Conference Program Director for a number of library and tech conferences
- Started career at BankAmerica Corp. in San Francisco (corporate library)
- Have worked in academic and public libraries as well
- Active member of IFLA and SLA/ASIS&T

Agenda for the evolution of search

- Overview of search epochs
- What characterized each epoch
- Different mindsets
- Future of search
- How we prove our value



Back in the day

- The precursor to online searching was printed indexes
 - They rarely provided a complete answer to a question
- Online searching, from the library perspective, began in the 1970s
 - Stemmed from indexes becoming machine readable
 - Aggregators of online databases – Dialog, Lexis, Orbit
- Internet searching began with the advent of Google
- Generative AI hit like a tidal wave in November 2022
 - The seems like decades ago, as a huge number of people use it daily
- Now we're considering agentic AI

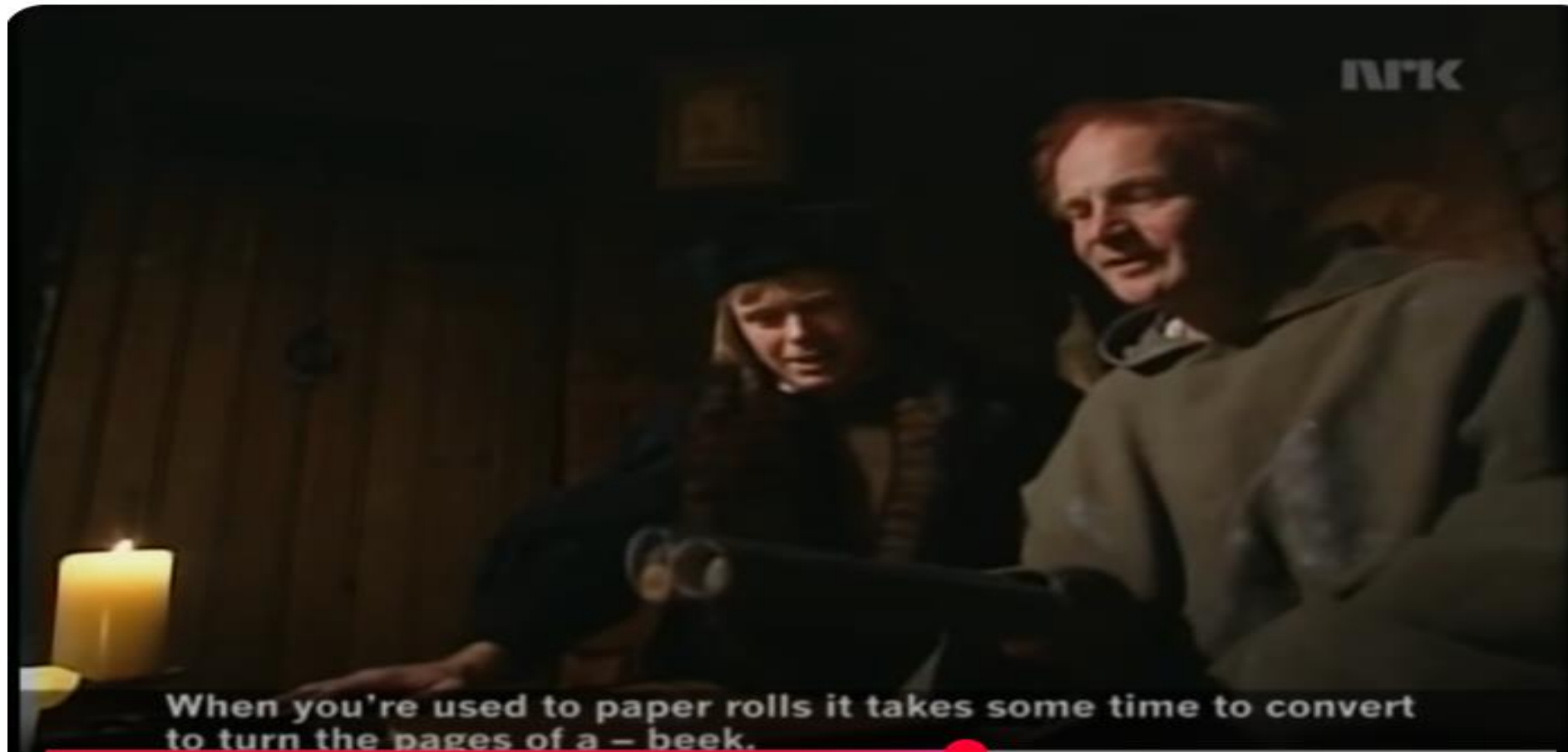
Printed indexes

- Laborious, had to search multiple volumes
- Limited, one or two thesaurus terms
- No cut and paste
- Succumbed to obsolescence
- Backbone of original online databases
- Or, if we want to go really, really far back...
 - What about transitioning from scrolls to books – a Medieval help desk saga



Technology changes require new skills

- <https://www.youtube.com/watch?v=pQHx-SjgQvQ>



Online search epoch

- Huge revolution in information retrieval
- Late 1970s, early 1980s
- Seems boring today
- No visuals, no color, just text
- Gave us the illusion that we could search and retrieve anything
- Actually, it was quite limited
- It was information retrieval not knowledge discovery
- How quaint

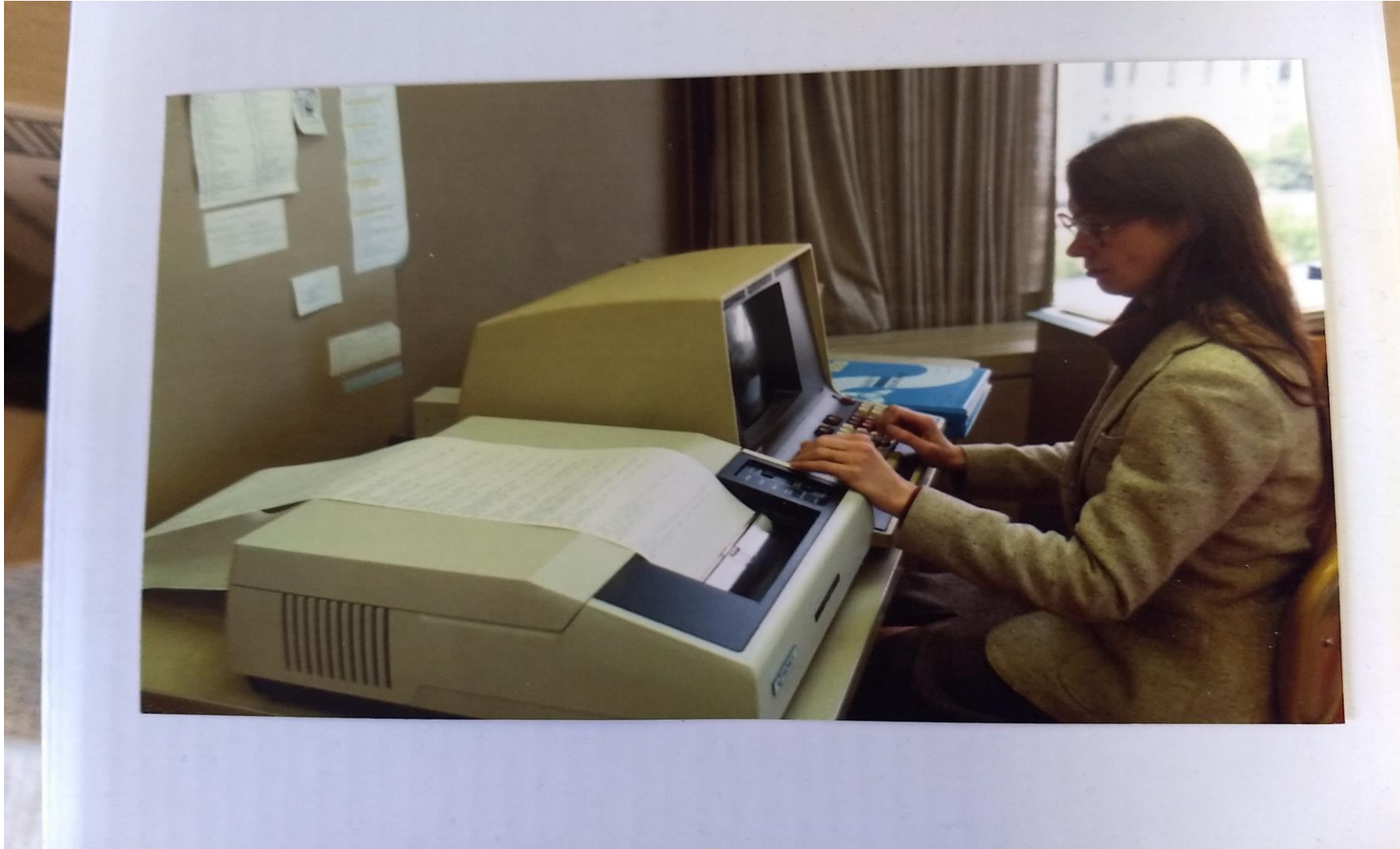


Early days of online searching

- One stop searching
- Multiple terms applied to documents
- Still controlled vocabularies
- Full text search added
- Sophisticated search strategies



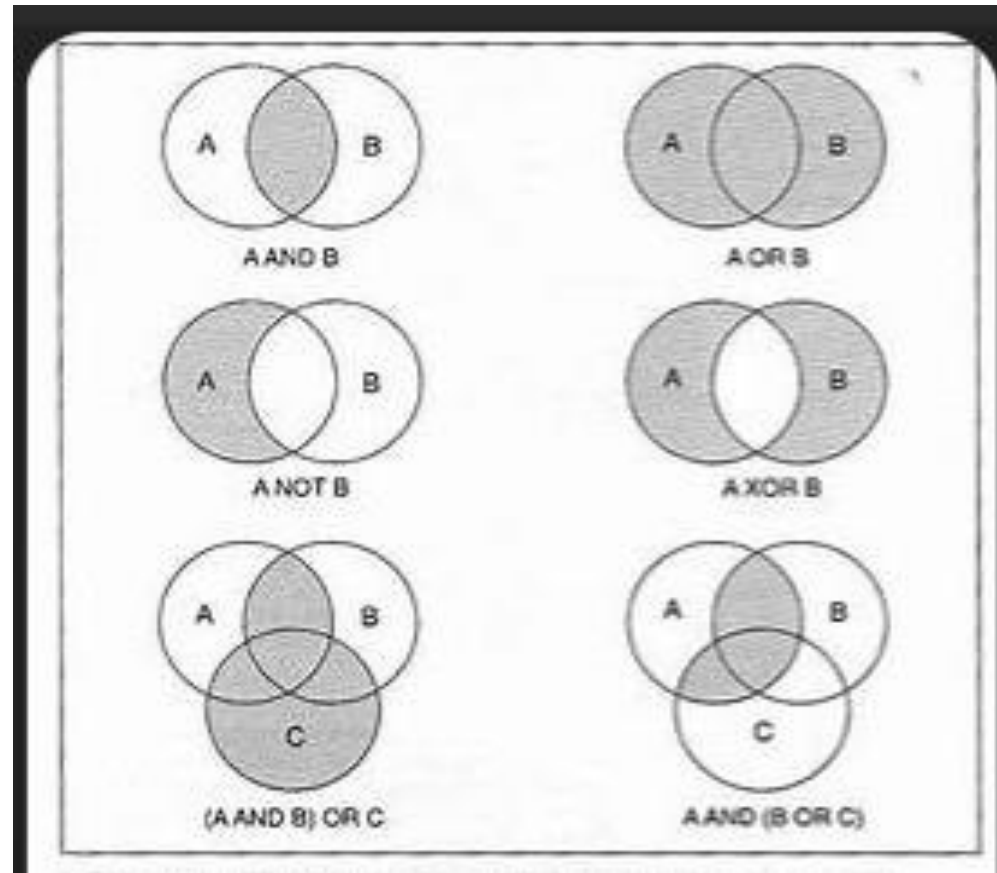
1979



Control

- Online databases were originally designed to be used by librarians – who knew what they were doing
 - They were often over-engineered
- That evolved into teaching students how to use Boolean logic to search library databases
 - And to a simplification of database architectures
- Relevance of search results was always an issue – and solved in different ways, most recently by machine learning
- The searcher was in control by virtue of Boolean logic, which was imprinted in how we looked at a research project

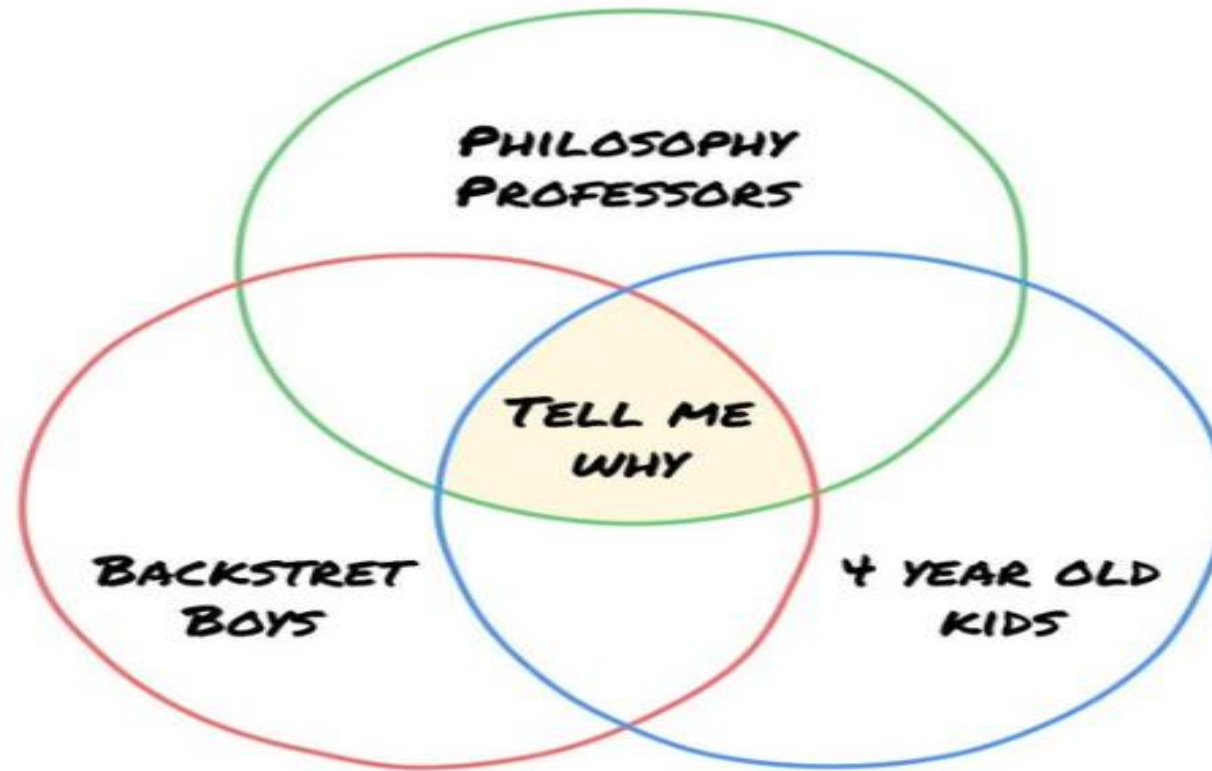
Boolean mindset



Blue plaque for John Venn



Mememes



Internet/web search



Internet/web search epoch

- Opened up search for everybody
- Search became the equivalent of Google
- Google became a verb
- Source material was almost anything
 - And not just text
- Unstructured formatting
- Appeal of free information
- Research became anything you could type into a search box



Internet/web search

- Searching the internet not structured databases
- Yes, Boolean but not quite
- Implied AND, but OR and NOT still needed to be specified
- Advanced search introduced non-info pros to Boolean
- Machine learning enhanced relevance
- It evolved from rudimentary search
 - To a piece of everyday life



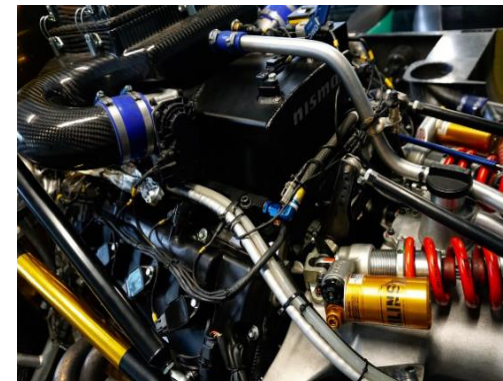
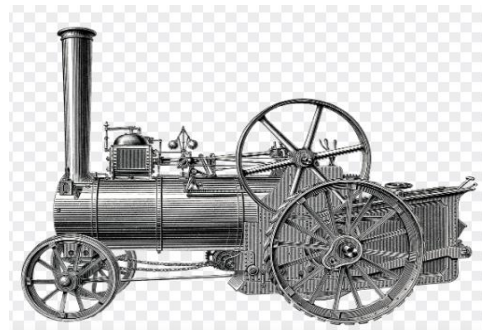
Web search mindset

- Answers show up as list of links
- “webliography”
- Snippets
- Search bar instead of a blank screen
- Expectation of click for full text
- Machine learning simplified search
- Illusion of command driven, actually behind the scenes algorithms



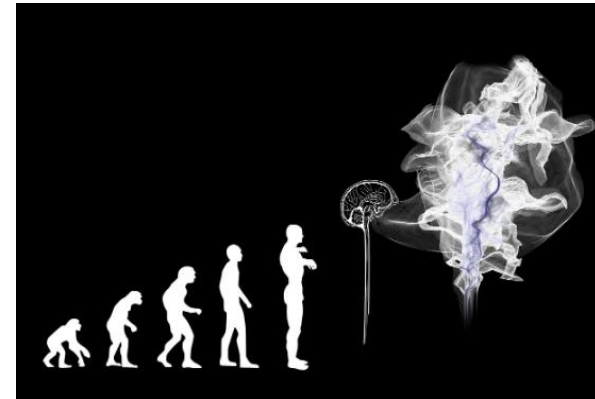
Web search mindset

- Multiple devices used for search, paralleled rise of smart phones
- Algorithms determined answers, info pros no longer in sole control
- Free to search, could enter variations on search query
- Bias, misinformation
- Search engines – metaphor of engine
- Everything is on the internet
- Driving forward



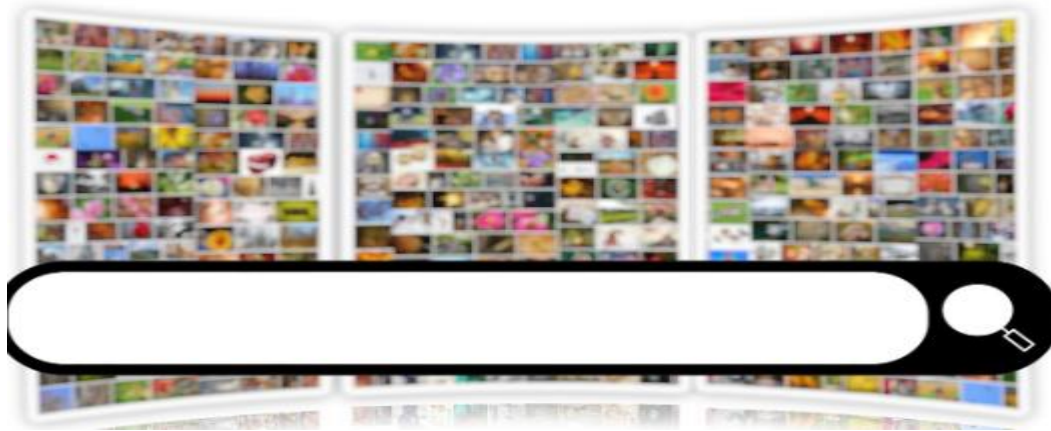
Generative AI Epoch

- ChatGPT introduced in November 2022
- The next revolution in search (and not just search)
- Sledgehammer to old structures of knowledge and organization
- Was web search a revolution? Or a natural evolution?
- Mindblowing for most of us
- Creativity not retrieval



GenAI searching

- Using a chatbot to search a language model
- It's mathematics, predictive analytics, advanced pattern matching
- Encourages natural language searching
- But it's not called "a search" or a "query" – it's a prompt



GenAI search

- Conversational search, iterative
- Not a search engine but an anthropomorphic AI
- What are we searching?
- Answer engine not search engine
- Ethical issues, particularly around copyright
- Is it for professional searchers?
- Or prompt engineers?
- Or both? Or something else?



Language

- Terminology changes over time
- Language in library databases, archival documents, and maybe even websites stays static
 - Sometimes that's OK (corporate history); sometimes not (language now considered highly inappropriate)
- Acronyms can have multiple meanings
 - MD – managing director/ medical doctor/ Maryland
 - AI is IA in French, Spanish and KI in German, Danish

Language matters

- Words used in prompts can skew results
- “Value of” “worth of” “ROI of” “what do people care about?”
- What is a “senior”? What is a “tie”?
- What role is assigned changes results
- Slang can date results (or confuse your copilot)
- Sometimes the chatbot forgets what it did earlier
- GenAI makes assumptions that may be incorrect
- Translations – word for word versus actual meaning



GenAI mindset

- Fundamental shift from information retrieval to information creation
- Generating not finding
- Anything goes
- Hallucinations, Made-up information
- Data as ephemeral, not reproducible
- Expectation is answers not links
- Trust issues (and too much trust issues)
- Everything is in the LLMs



New dimensions to search

- Not just published literature or the web
- Search within documents
- Summarize search results
- Search your email
- Note taking
- Record verbal from conference talks and search that
- Brainstorming
- Creating information not retrieving information



From books to Boolean to bots

- Coming next: Agentic AI
- Agents operating with a degree of autonomy, making decisions and taking actions to achieve specific goals, all by themselves. They can analyze situations, develop strategies, and execute tasks in parallel.
- Research, evaluate, write report, gather feedback from client
- Can they become information professionals? Act as librarians in a searching capacity? Do our jobs for us?
- What is our contingency plan? Is this a threat or an opportunity?

Changes in mindset



Search epochs

- Are not discrete, each is layered on top of earlier ones
- It's as if we're in the Stone Age, Medieval times, the Industrial Revolution, and the Space Age all at the same time
- Linear thinking to non-linear thinking
- Structured information to unstructured information
- Textual to visual, audio, graphic information
- Will Boolean disappear, become a footnote in search history?

Searching



Search & rescue



Searching for



Searching for

- Scholarly literature
- News stories
- Data sources
- Business information
- Medical diagnoses
- Humanities research
- Science experiments
- And loads of other stuff that's not trivial



The fundamental question

- What do we mean by search?
- It has evolved over time
- It means different things to different people
- Does search = research?
- Scholarly literature, news, science experiments?
- Evaluating results becoming more important
- What are our challenges in evolving along with the technological evolutions in search while not abandoning previous search mindsets
- Yes, we need to be in multiple places at once



Mindsets going forward

- Shift happens – and it happens ridiculously quickly
- As search evolves, how are we evolving?
- Subscription databases are incorporating AI
- Devices shape search behavior
- Should we still know how to wash dishes by hand even though we have a dishwasher?
- How much trust should we have in AI?
- The difference between searching, finding, generating, and knowing



Opening up new knowledge

- “Researching Native Americans: Reflections on Vocabulary, Search Strategies, and Technology” by Alexander Soto, A. Brave Heart Sanchez, Jeanette M. Mueller Alexander, Joyce Martin. Online Searcher, Sept/Oct 2021
- An Indigenous doctoral student was researching boarding school policies in the 1800s on hair length of male students and wanted to find a specific boarding school hair policy. The query below was helpful in retrieving a relevant source:
- ((Indigenous OR native OR indian OR inuit) n/3 (boy OR male OR m?n) n/10 (hair OR braid) n/10 (polic* OR cut* OR regulation) AND masculin*)

GenAI

- What policies did boarding schools for indigenous/Indian students have about hair length for boys in the 1800s?
- Answers were not great. Even when asked about whether there were dissertations on the topic (the PQ results found one that was very valuable to the researcher), it didn't surface that one
- Deep research could have found more
- Good enough, maybe, for first year student; not good enough for doctoral level or public policy research

Where do we go from here?



Proving our value

- The epochs of search reinforce our ability to be valuable to our organizations and our constituencies regardless of technology
- We evolve, adapt, pivot, learn, and prevail
- We know not just technology but what individual users expect from our searches
- We support the universal value of information and knowledge, knowing how best to meet the information needs in front of us
- As we look to the next epoch, the next evolution/revolution in search the next change, let's be the change we seek and not be negative about search technology developments

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