Evolution of search queries

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What is the purpose of a search query?

- A human’s way to find data in a large dataset
- Describe what you are looking for
- Used for information retrieval

But people write search queries to be appropriate for the search engine

And the technology behind search engines have changed a lot throughout time

Let’s explore how search queries evolved from simple key words to sophisticated, context-aware interactions

Keyword-Based Search

- **1990s**: The initial form of search engines used simple keyword matching. Users entered short, specific keywords, and the search engine looked for exact matches in its indexed pages.
- **Search Techniques**: Boolean operators (AND, OR, NOT) were used to refine results. Search was mainly based on literal word matching without much understanding of the query's context or meaning.

- As search engines evolved, they started recognizing phrases and allowed proximity searches (terms appearing close together). This helped in better identifying content that matched the user's intent more precisely.
- **Example**: Searching for "cat food" as an exact phrase instead of searching for "cat" AND "food" separately.

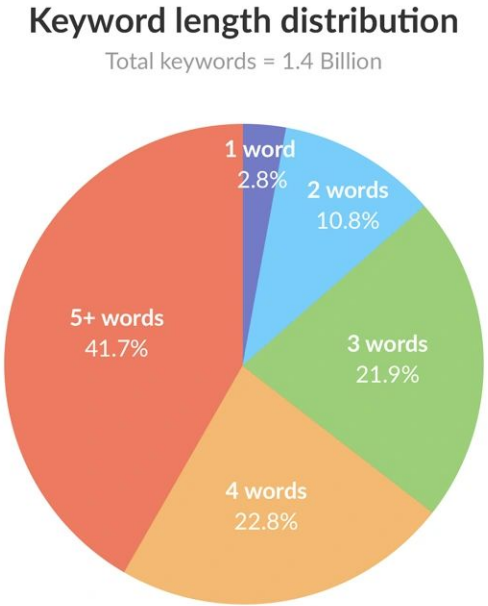
Natural Language Processing (NLP)

- **2000s and Beyond**: Search engines began incorporating natural language processing (NLP) to better understand user queries that were more conversational in nature.
- **Improvements**: NLP allowed users to type longer, more detailed questions (e.g., "Where can I find the best cat food in New York?"), and the search engine could parse and understand the relationships between the words.

Semantic Search and Knowledge Graphs

- **Mid-2010s**: The introduction of semantic search improved search by understanding the intent and context behind queries. This marked a shift from keyword-based search to intent-based search.
- **Knowledge Graphs**: Introduced by Google in 2012, these allowed search engines to connect concepts and provide direct answers, snippets, and structured data instead of just a list of links.
- **Example**: A search for "Leonardo da Vinci" not only returned websites but also showed structured information about his biography, works, and related figures.

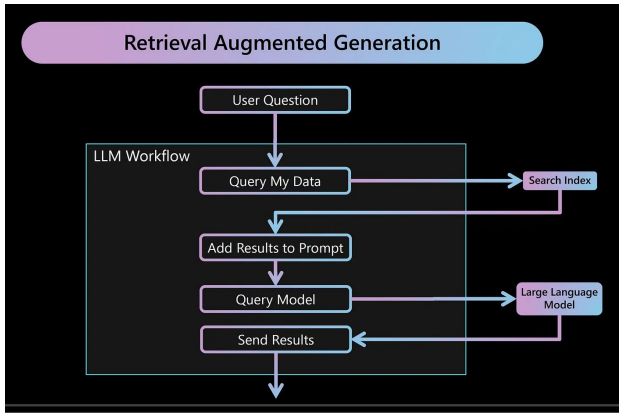
2017:



https://blog.hubspot.com/marketing/search-has-changed-content-needs-to-evolve

AI and Machine Learning Integration

- **2020s**: AI-driven technologies enabled search engines to better understand the nuances of human language, including the relationships between words in a sentence and their context.
- **Query Personalization**: Machine learning helps tailor search results to individual users based on past behavior, preferences, and location.
- **Recent Developments**: Search has evolved to include images, videos, and other types of content. Visual search (e.g., searching with images) and multimodal search (combining text and images) have emerged.
- **Conversational AI**: Generative AI tools like ChatGPT can answer complex queries, provide context, and maintain interactive dialogues, reflecting another shift in how people seek information



Predictive and Intent-Aware Searches

- **Current Trends**: Search engines leverage data to predict user needs and offer suggestions proactively. This involves understanding user context and offering results before a full query is even typed (e.g., Google’s predictive search).
- **Query Types**: Search queries now consider implicit user preferences, like previous searches, location, and current trends.

Conclusion

- Queries are getting longer and longer
- Queries have become less like keywords and more like sentences
  - Due to machine learning and advancements in NLP
- Now, your query is not the only thing deciding your search results
  - Past behavior, preferences, location etc.
- There might be an incoming shift in how people look for information
  - Generative AI tools like ChatGPT makes search be more like a conversation