Information Retrieval

Evaluation of Text Retrieval Systems

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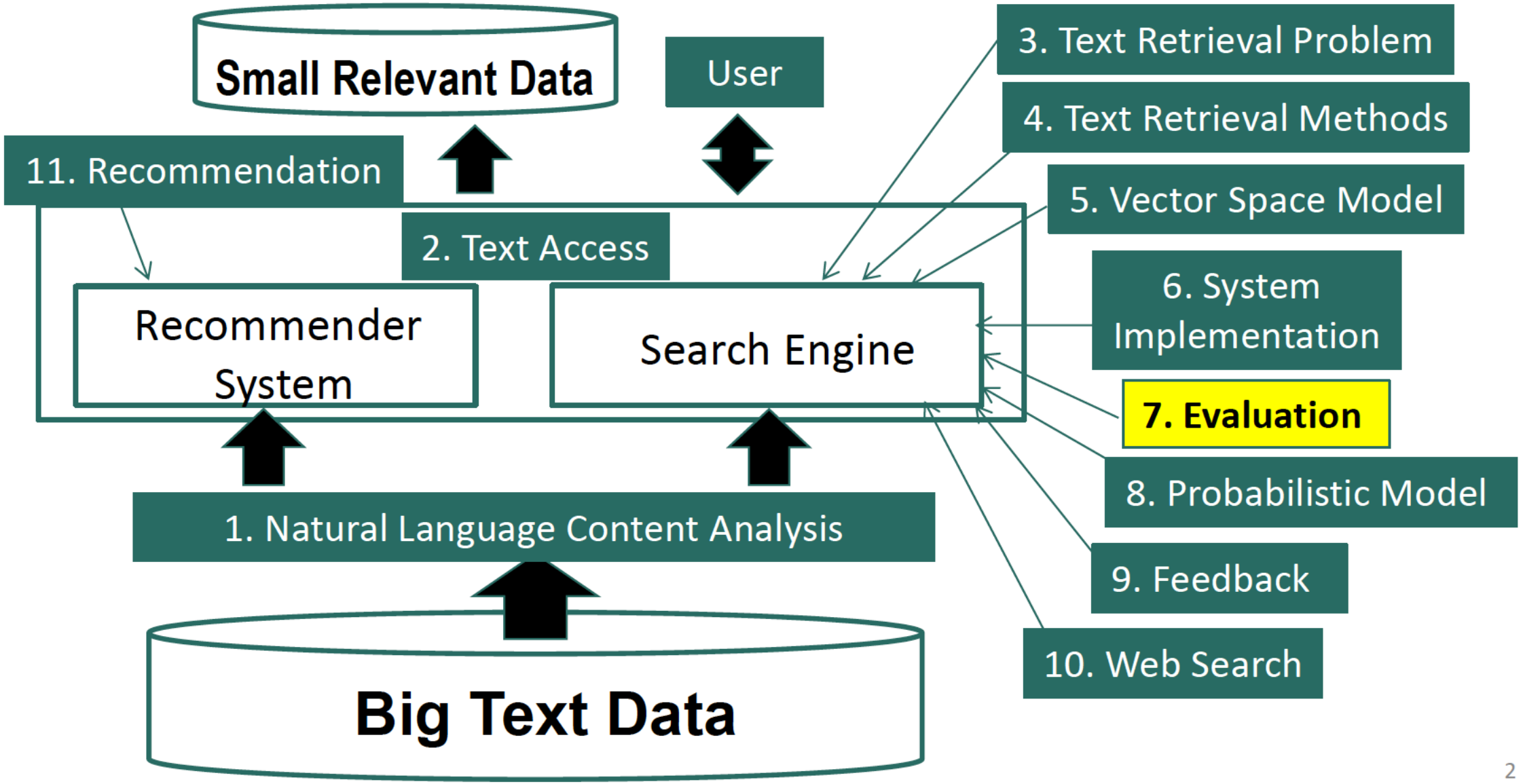


Why Evaluation?

- Reason 1: Assess the actual utility of a TR system
  - Measures should reflect the utility to users in a real application
  - Usually done through user studies (interactive IR evaluation)
- Reason 2: Compare different systems and methods
  - Measures only need to be correlated with the utility to actual users, thus don't have to accurately reflect the exact utility to users
  - Usually done through test collections (test set IR evaluation)

What to Measure?

- Effectiveness/Accuracy: how accurate are the search results?
  - Measuring a system's ability of ranking relevant docucments on top of non-relevant ones
- Efficiency: how quickly can a user get the results? How much computing resources are needed to answer a query?
  - Measuring space and time overhead
- Usability: How useful is the system for real user tasks?
  - Doing user studies **Interfaces**

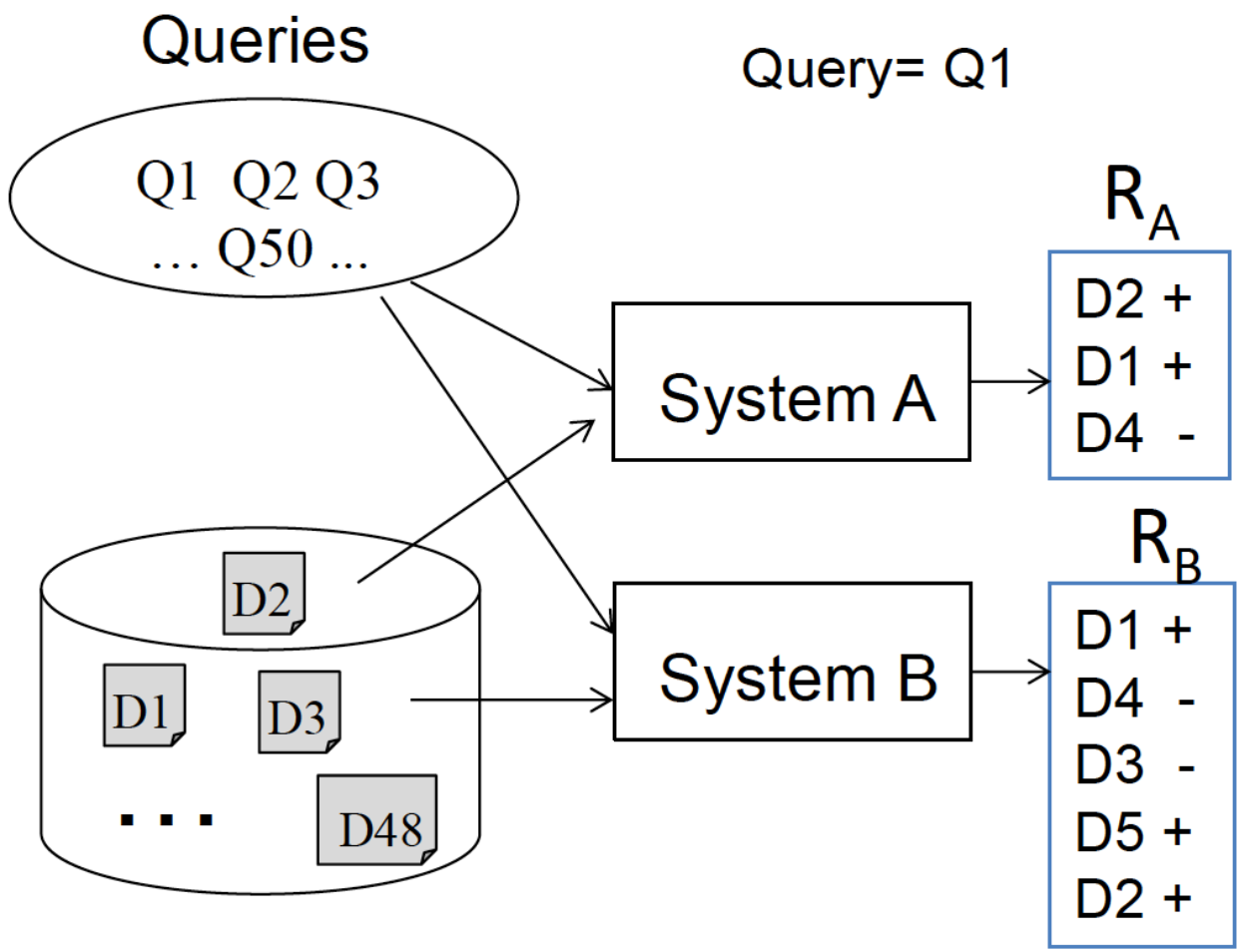
The Cranfield Evaluation Methodology

- A methodology for laboratory testing of system components developed in 1960s
- Idea: Build reusable test collections & define measures
  - A sample collection of documents (simulate real document collection)
  - A sample set of queries/topics (simulate user queries)
  - Relevance judgments (ideally made by users who formulated the queries) ➔ Ideal ranked list
  - Measures to quantify how well a system's result matches the ideal ranked list
- A test collection can then be reused many times to compare different systems

Initially designed only for search systems but now it has been effectively employed for big data tools.

Useful for all kind of empirical tasks.

Test Collection Evaluation



Which is better?

R_A or R_B?

How to quantify?

Relevance Judgments

Q1 D1 +
Q1 D2 +
Q1 D3 –
Q1 D4 –
Q1 D5 +
…
Q2 D1 –
Q2 D2 +
Q2 D3 +
Q2 D4 –
…
Q50 D1 –
Q50 D2 –
Q50 D3 +