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Chennai



**DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA
SCIENCE**

Recommender System



RETRIEVAL MODELS



There are several information retrieval techniques and types that can help you with the process. An information retrieval comprises of the following four key elements:

1. **D** – Document Representation.
2. **Q** – Query Representation.
3. **F** – A framework to match and establish a relationship between D and Q.
4. **R** (q, d_i) – A ranking function that determines the similarity between the query and the document to display relevant information.



TYPES OF INFORMATION MODELS



- Classical IR Model
- Non classical IR Model
- Alternative IR Model



TYPES OF IR MODELS



Classical IR Model:

- It is designed upon basic mathematical concepts and is the most widely-used of IR models.
- Classic Information Retrieval models can be implemented with ease.
- Its examples include Vector-space, Boolean and Probabilistic IR models.
- In this system, the retrieval of information depends on documents containing the defined set of queries.
- There is no ranking or grading of any kind.
- The different classical IR models take Document Representation, Query representation, and Retrieval/Matching function into account in their modelling.
- This is one of the most used Information retrieval models.



TYPES OF IR MODELS



Non-Classical IR Model:

- They differ from classic models in that they are built upon propositional logic.
- Examples of non-classical IR models include Information Logic, Situation Theory, and Interaction models.

Alternative IR Model:

- These take principles of classical IR model and enhance upon to create more functional models like the Cluster model, Alternative Set-Theoretic Models Fuzzy Set model, Latent Semantic Indexing (LSI) model, Alternative Algebraic Models Generalized Vector Space Model, etc.



MOST ADOPTED SIMILARITY BASED CLASSICAL IR MODELS



1. Boolean Model:

- This model required information to be translated into a Boolean expression and Boolean queries.
- The latter is used to determine the information needed to be able to provide the right match when the Boolean expression is found to be true.
- It uses Boolean operations AND, OR, NOT to create a combination of multiple terms based on what the user asks.
- This is one of the information retrieval models that is widely used.



MOST ADOPTED SIMILARITY BASED CLASSICAL IR MODELS



2. Vector Space Model :

- This model takes documents and queries denoted as vectors and retrieves documents depending on how similar they are.
- This can result in two types of vectors which are then used to rank search results either
 - Binary in Boolean VSM.
 - Weighted in Non-binary VSM.



MOST ADOPTED SIMILARITY BASED CLASSICAL IR MODELS



3. Probability Distribution Model:

- In this model, the documents are considered as distributions of terms and queries are matched based on the similarity of these representations.
- This is made possible using entropy or by computing the probable utility of the document.
- They are of two types:
- Similarity-based Probability Distribution Model
- Expected-utility-based Probability Distribution Model



MOST ADOPTED SIMILARITY BASED CLASSICAL IR MODELS



4. Probabilistic Models:

- The probabilistic model is rather simple and takes the probability ranking to display results.
- To put it simply, documents are ranked based on the probability of their relevance to a searched query.
- This is one of the most basic information retrieval techniques used.

