The ShowMe application will allow researchers to visualize the relations between research papers and their relevance. Since the application contains a huge dataset of research paper information, a search box will help the user to access the Research paper details quickly.

**Front End**

An auto-suggest / auto-complete feature will provide prompts that saves user from extensive keystrokes and results in quick access of the research paper information

**Server Side**

It is necessary to ensure that the search across the research papers happen quickly so as to provide suggestions to the user in the search box as the user starts typing.

With information such as Title, Year, Author and Publication, the user search may span across multiple fields of the paper dataset.

Approaches:

1) Searching the database using wild-card / regex match

This is the most resource intensive and inefficient way to perform text search especially when the search spans across multiple fields of a huge data set .

2) Indexing multiple fields of MongoDB database

Indexing results in the creation of Tree data structure with the keys as the field value and the pointer/value as the document within the MongoDB database. While MongoDB provides an efficient indexing mechanism, there are additional overheads such as the index tree maintained in-memory and the multi-field search that may not be efficiently handled by MongoDB.

Mongo DB’s full text search functionality needs to be vetted against that of Elastic Search.

3) Elastic Search

Elastic Search is built for full text search using reverse indexing (wherein parts of the field values e.g. parts of the ‘title’ field) are used as index and the value includes references to all the documents where the particular value appears. Moreover, Elastic Search is suitable for search across multiple fields.

References:

1) <https://stackoverflow.com/questions/12723239/elasticsearch-v-s-mongodb-for-filtering-application>

2) <https://docs.mongodb.com/manual/core/index-properties/>

3) <https://stackoverflow.com/questions/29892947/implement-auto-complete-feature-using-mongodb-search>