



User-centered Non-factoid Answer Retrieval

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ABSTRACT

Non-factoid Question Answering (QA) has recently gained substantial interest in the Information Retrieval (IR) community, with emphasis mainly given to improving classical performance metrics in response to natural language questions. While this is a vital area of research given recent advances in natural language understanding and the wide adoption of digital assistants, such QA tasks still occur using search engines with typed-in queries which may not adhere to this assumption (i.e., the use of uniform natural language questions). The way in which users express and satisfy complex question-answering information needs in the context of search engines is an under-studied issue.

In this research, we aim to examine the assumptions that are made about users when searching for non-factoid answers using search engines. That is, the way they approach non-factoid question-answering tasks, the language they use to express their questions and their behavior in response to the provided answers. The investigation will also examine the extent to which these neglected factors affect retrieval performance and potentially highlight the importance of building more realistic methodologies and test collections that capture the real nature of this task. Our understanding of how users approach the task and interact with the search engine should enable better interaction models that could provide an enhanced user experience. This research particularly addresses the following research questions:

- **RQ1:** What are the characteristics of queries with question-answering intent that are submitted to search engines?
- **RQ2:** How do question-answering queries vary across users, and how does this impact on the effectiveness of modern IR models?
- **RQ3:** How do users behave in response to receiving an answer, and what can be learned for an enhanced interaction model?

Previous research has indicated a continuous change in the language users use when searching the web, moving from query keywords to a more natural language expression of information needs [3]. There is, however, a lack of recent research quantifying the frequency of such queries, a definition of what naturality means in the context of web search and, most importantly, understanding the influence of query language on modern retrieval models.

In addressing **RQ1**, we have begun to explore the characteristics of non-factoid question-answering queries and distinguish them

from those sampled in QA datasets. Preliminary results demonstrate notable differences between non-factoid questions sampled from a large query log and those used in QA datasets. In addition, existing research [1] suggests that users tend to express similar information needs in various ways. Yet, the variability is not reflected in the non-factoid QA research. While semantically preserved variations tend to have a minor and somehow predictable and well-understood effect on traditional IR models, their impact on modern IR models is under-investigated.

In **RQ2**, we aim to understand query variability and quantify their impact on the effectiveness of modern IR models. Our preliminary results demonstrate a profound effect of query variability on retrieval consistency, indicating a potential impact on retrieval performance that is worth studying.

Potthast et al. [2] call for providing direct answers only for questions whose answers are clear and well-accepted (i.e., factoid). They argue that the provision of answers otherwise could imply that the answer is the ultimate and only truth and discourage or eliminate the need to browse and research further. While the argument is sound, preventing the direct answer for such questions is not viable given the increasing use of mobile phones in which an answer is more convenient. Instead, better ways to provide direct answers while still keeping the information flowing with ways to engage, understand and explore the answer space is critically essential. In **RQ3**, we aim to understand user behaviour while searching for non-factoid answers, specifically the way they behave after receiving an answer. This should advance our understanding of the support users require across different types of non-factoid questions and inform the design of interaction models that support learning and encourage exploring.

CCS CONCEPTS

• **Information systems** → **Users and interactive retrieval;**
Question answering.

KEYWORDS

Non-factoid Question-answering, Query formulation, User behaviour

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