The significance of search, support for complex tasks, and searcher- aware information access systems

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4.8 The Significance of Search, Support for Complex Tasks, and Searcher–aware Information Access Systems

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This abstract documents three loosely related challenges. The first challenge is the role and significance of the field in general. There are massive challenges in the way the information available is changing in quantity and in character, and in the ways we create, publish, share, and use information in the always-online world. This urges us to keep 'reinventing search' and redefine the field of information retrieval and its key research problems and research methods. How do these changes affect the core questions we address in the field of IR and what sort of evidence do we need for addressing these questions? How can we factor the larger scope and context into IR evaluation? It is interesting to consider a publication like Salton's "Developments in automatic text retrieval" published in Science in 1991. Salton (1991) is from before the Web happened and discusses all the basic IR aspects: retrieval models, indexing structures, but also hypertext, knowledge resources and semantic search. Articles like Salton (1991) still look surprisingly modern! This raises two question that are perhaps not unrelated: First, why hasn't our research field changed in a dramatic way to suit the revolutionary changes in the information environment. Second, why isn't our field making a larger impact outside our field (Salton published 2 Science articles in 1991) given the dramatic increased role and importance of "search" nowadays.

The second challenge is to work on information access tools that support complex tasks. That is, to build and evaluate information access tools that actively supports a searcher to articulate a whole search task, and to interactively explore the results of every stage of the process. In the prolonged search session, how should we evaluate the overall effectiveness as well as the success at various stages? How can evaluation reflect the different goals of each stage? There is a striking difference in how we ask a person for information, giving context and articulating what we want and why, and how we communicate with current search engines. Current search technology requires us to slice-and-dice our problem into several queries and sub-queries, and laboriously combine the answers post hoc to solve our tasks. Combining different sources requires opening multiple windows or tabs, and cutting-and-pasting information between them. Current search engines may have reached a local optimum for answering micro information needs with lighting speed. Supporting the overall task opens up new ways to significantly advance our information access tools, by develop tools that are adapted to our overall tasks rather than have searchers adapt their search tactics to the "things that work."

The third challenge is to make information access systems more informed about the searcher. Can we make a retrieval system aware of the searcher's stage in the information seeking process, tailor the results to each stage, and guide the searcher through the overall process? How to evaluate the utility of this (accuracy of the prediction, usefulness of the support, etc)? Can we equate evaluation with observing preferred information interaction patterns? A search session for a non- trivial search task consists of stages with different sub-goals (e.g., problem identification) and specific search tactics (e.g., reading introductory texts, familiarizing with terminology). Making a system aware of a searcher's information seeking stage has the potential to significantly improve the search experience. Searchers are stimulated to actively engage with the material, to get a grasp on the information need and articulate effective queries, to critically evaluate retrieved results, and to construct a

comprehensive answer. This may be of particularly great help for those searchers having poor information or media literacy. This is of obvious importance in many situations: e.g., education, medical information, and search for topics "that matter". Some special domains, such as patent search and evidence based practices in medicine, have clearly prescribed a particular information seeking process in great detail. Here building a systems to support (and enforce) this process is of obvious value.