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The Efficacy of Google's Suggested Keywords and Phrases in Query Expansion Based on "The Least effort Principle" and "Cognitive Load Theory"

Abstract

Purpose: One of the most effective ways to improve relevance performance in IR systems including Web search engines is to provide their users with tools facilitating query expansion. Search engines such as Google provide users with keyword suggest tools. The aim of this research was to investigate Users reactions regarding the efficacy of Google's suggested keywords/queries in query expansion based on "The Least effort Principle" and "Cognitive load Theory" from users' view

Design/Methodology/Approach: Through a mixed method approach quantitative and qualitative data were collected from 60 postgraduate students at Ferdowsi University of Mashhad, Iran (Humanities & social Science - Basic and engineering science) using four different instruments (questionnaire, thinking aloud technique, query logs, and interviews).

Findings: Among others the „relation between suggested keywords and the information need” (mean rate of 3.53 out of four) was considered the most important by searchers in selecting suggested keywords for query expansion. Also the „relation between suggested Keywords and the retrieved items’ (mean rate of 3.62) was considered the second most important criterion in judging the relevance of the retrieved results. The participants agreed that the suggested keywords improved relevance.

According to the type and the level of suggested keywords/queries cognitive load, the results show that suggested keywords/queries and retrieved documents have not made any negative cognitive load for uses. Most of the suggested keywords/queries and retrieved pages have conformity with users’ needs. The other hypothesis test show that there is a significant difference between the relevancy of retrieved results of primary queries and retrieved results of query expansion based on suggested keywords/queries. In other words, suggested keywords/queries help improve the relevancy.

Based on “the least effort principle”, findings show that over 87% users considered and used Google’s suggested keywords/queries. There is no significant difference between the usage of suggested keywords/queries among different groups of users - liberal arts and the other fields of sciences. Finally some applicable solutions for improving the relevancy of retrieved suggested keywords/queries have been suggested.

Originality/value: This research makes a contribution to the need of designers of IR systems to support query expansion. Another contribution of the study is the identification of a number of new relevance judgment criteria for web-based environments.