











time of their information need, which is particularly true for recent dates. Our final analysis on user search satisfaction, shows that users are noticeably more satisfied in search sessions where queries have a temporal expression. This confirms the importance of temporal expressions and allows us to conclude that users search experience may benefit from being suggested likely related time periods to their initial query or shown user temporal interfaces, such as timelines.

#### 4 CONCLUSIONS

In this paper we investigated the use of temporal expressions in web queries on Persian web search. To conduct this study, we used two different datasets. First, we resorted to a two-year log of a Persian search engine consisting of 27M. Second, we rely on the above collection to select a representative sample of 10.000 queries. This enabled us to understand whether temporal expressions are or not, associated to a determined type of query category. Overall, the results obtained are in line with the work of Nunes et al. [20] and confirm that only a tiny short of Persian queries contain temporal expressions, which given the huge number of queries issued by users today, may still represent a huge quantity. Based on this, we were able to confirm that temporal expressions are mostly used within a short number of categories and that most of the temporal expressions used are related to the present time. Our analysis also revealed that 74.2% of temporal search sessions, were initiated with a temporal expression showing users awareness of his or her preferred time point(s). Finally, we were able to study that the use of temporal expressions in web searches strongly increases users' satisfaction. Compared to non-temporal search sessions, users' satisfaction is 41.3% higher when there is a query with temporal expressions in search sessions. This may be considered a noticeable number. As for future work, we plan to study how search engines should leverage explicit temporal expressions to improve search results effectiveness. We plan to do this by using the content of clicked pages and their relationship with temporal expressions. Finally, we also plan to study the use of implicit temporal expressions in Persian web searches in line with the stated-of-the-art.

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