Due to the ever growing volume of database content and the personalization needs in information searches, human preferences play an essential part in today’s information systems. This is because mere traditional database queries quite often produce empty or too numerous results. The user is frustrated in both cases and feels left alone facing the information flood. The APIS Group at L3S Research Center investigates personalized service provisioning based on individual sets of personal preferences for each user. Such preference sets not only best express user’s information needs, but also state the trade-offs each user is prepared to consider. In short, respecting user preferences and efficient preference handling are essential building blocks towards truly cooperative information services.

Focus on Cooperative System Behavior

Cooperative information systems offer user-centered querying by automatic relaxation of (less important) query parts. Today, most systems use complicated ranking schemes to express the utility of information with respect to the query. However, the practical applicability in large information sources still remains rather limited: generally users cannot be expected to provide meaningful weightings for a complex utility function and subsequently, neither can calculated rankings be explained intuitively to the user.

Therefore, recently the skyline query paradigm has been applied in a variety of applications ranging from digital item adaptation to location-based information services. In skyline queries, the user merely specifies basic predicates to be queried and in return, an optimal result set is always retrieved. A user simply cannot miss any important answer. However, the advantage of intuitive query formulation comes at a price: on the one hand, skylines are rather expensive to compute; on the other hand skylines are known to grow exponentially in size with increasing number of query predicates. Thus, the user again has to face the information flood.

Focus on Interactive Query Processes

The APIS approach works together with the user to personalize results and supports refinements of the individual preference profile. Users are enabled to interactively specify additional preference information, as well as equivalences between choices, leading to an incremental reduction of result set sizes. Users can thus even express trade-offs or compromises they are willing to consider and can also intuitively adjust imbalances between fine-grained and coarser preference specifications. In all these tasks, the APIS system efficiently supports the user by automatically taking care that newly specified preferences and equivalences will never violate the consistency of previously stated preferences. Users will not encounter conflicts and will understand how their information need shapes the result set.

Moreover, the efficient algorithms developed in the preference handling framework allow the retrieval of focused result sets, respecting real time constraints even over large information collections. The benefits of APIS’s personalized information services are pervasive information access with proactive support for information search and retrieval. Together with innovative wireless technologies and powerful client devices, these services help to provide the right information anytime, anywhere. The APIS project is committed to bringing together researchers from different disciplines to improve the personalization capabilities in today’s information services. APIS is funded by the German Research Foundation as part of the Emmy-Noether-Program of Excellence.

Project abstract:

APIS - Advanced Personalization in Information Services APIS aims at personalized service provisioning based on individual sets of personal preferences for each user. These preferences are part of a flexibly adaptable profile and more necessary information can be elicited on demand directly from users. Directly focusing on the users’ information needs APIS thus investigates technologies to efficiently provide ‘prime cuts’ of all available information in an interactive and cooperative query process.
Project duration: 01.11.2004 - 31.10.2008

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URL: www.L3S.de/apis
Research Area: Intelligent Access to Information
Status of the Project: