ABSTRACT

The domain of information retrieval has grown by leaps and bounds in the past few years. The proliferation of mobile devices for web searching has led to a lot of interest in applying the techniques of information retrieval in the domain. The challenge is to address the information overload and increase the relevance of the results generated. The existing work has focused on applying the techniques in information retrieval for the web through mobile devices in terms of query suggestions, user interaction design, using the user’s profile etc. These works have been implemented for a specific mobile device or using an intermediate server. So there is a need for effective information retrieval systems that could be deployed in the mobile device considering the limitations in terms of the limited input output capabilities, storage space and processing power.

The objective of this work is to propose an adaptive framework for information retrieval through mobile devices. The goal is to enable the users to search for information from the web effectively.

The framework enables the search process by giving suggestions and uses profile mining and term relationships for re-ranking the results. This is accomplished by proposing five context modes namely Fast, Personal, Expanded, Balanced and Relevant. The Fast mode is the baseline mode that implements the existing search engine. The Personal mode and Expanded mode generates the query suggestions for the users from the ontology situated
in the mobile device and the web respectively. The Balanced mode uses the trust metrics of the websites already encountered and the user’s preference. In the Relevant mode, the aim is to use a combination of term-query relationship, inter-term relationship and trust values of the snippet content.

A generic database centric ontology for mobile environment is developed considering the challenges of managing the data with the limited operational facility of the data store. The functioning of the ontology is designed using a reasoning system which uses an event condition action system. A compression algorithm has been deployed to enhance the compression ratio of the content that is stored which can overcome the limitation of the storage available. The content retrieved needs to be adapted based on the device settings namely, the number of lines that can be displayed in the system. A Uniform interface design, to overcome the lack of interfaces in the mobile environment has been proposed.

The prototype of the framework was developed using J2ME. The performance of the framework was evaluated in terms of the speed, relevance and accuracy and the framework performed better than the conventional system. The inclusion of the user’s opinion for generating suggestions, ontology construction and trust modeling in the framework makes the testing of the prototype more realistic. The framework for information retrieval is generic and scalable as it can be applied in all kinds of mobile devices. The results show the promise of this research and pave the way for further work in the domain.