Chapter 7

OntoQuery — An Evolutionary Approach for Query Formation and Information Retrieval

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ABSTRACT
This chapter proposes the establishment of OntoQuery in an m-commerce agent framework. OntoQuery represents a new query formation approach that combines the usage of ontology and keywords. This approach takes advantage of the tree pathway structure in ontology to form queries visually and efficiently. Also, it uses keywords to complete the query formation process more efficiently. Present query optimization techniques like relevance feedback use expensive iterations. The proposed information retrieval scheme focuses on using genetic algorithms to improve computational effectiveness. Mutations are done on queries formed in the earlier part by replacing terms with synonyms. Query optimization techniques...
used include query restructuring by logical terms and numerical constraints replacement. Also, the fitness function of the genetic algorithm is defined by three elements, number of documents retrieved, quality of documents, and correlation of queries. The number and quality of documents retrieved give the basic strength of a mutated query.

INTRODUCTION

Mobile computing will be the next buzzword of the next century. Presently, consumers demand personalized wireless computing services while they are mobile. This infantile paradigm of mobile computing is opening up new markets. Corporate power users who are at the cutting edge of technology are always armed with an arsenal of mobile equipment.

Current Situation and Motivation of Research

With the exponentially growing number of Internet users over these few years, the International Data Corporation (IDC) expects an increase to $4.3 trillion by 2005. Thus, as can be seen, trading online has become increasingly important to the commercial world. It is inevitable that e-commerce will be the next strategy that companies are going to adopt.

At the same time, with the introduction of new technologies such as WAP, HSCSD, GPRS, UMTS, and Bluetooth together with new and personalized applications, it is believed that the e-commerce arena will sooner or later merge its applications with handheld devices to create more opportunities for the birth of mobile commerce. In fact, research from the IDC expects the mobile portal to reach 55 million users by 2005.

However, according to the IDC, there was a 26% drop in the sales of handheld devices in the first quarter of 2002. One of the reasons why the potential of mobile commerce is largely unrealized to date is because there still does not exist a single killer application that can attract wireless users to use wireless services. According to a recent survey by Gartner, Inc., besides the importance of coverage of wireless network and pricing issues, the wireless Internet and data services are the next crucial factors that attract users to use wireless service. As such, there is a need to improve the data services over the wireless network. One of these services is the information retrieval service.

Most electronic product information retrieval systems are still not efficient enough to cater to the increasing needs of customers. This is especially serious in the m-commerce arena, where the bandwidth of mobile devices is low and large data would not be possible. Thus, the discovery of new information retrieval techniques is inevitable.
Virtual Enterprise Organization
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