Chapter 13

EE-Cat: Extended Electronic Catalog for Dynamic and Flexible Electronic Commerce

Jihye Jung, Dongkyu Kim, Sang-goo Lee, Chisu Wu and Kapsoo Kim
Seoul National University, Korea

Providing quick and easy access to electronic catalogs of products is one of the most essential parts in the electronic catalog environment. Proposed in this paper are data and query model for electronic catalogs which offer effective searching and management facilities to customize the electronic catalog system. The proposed model separates the management of product information and the visual presentation. Product information is represented as a graph. The model extends the range of electronic catalogs from product information to the whole web documents and their structure. The proposed query language makes the extended catalog more dynamic, flexible, and easy to maintain.

INTRODUCTION

There are many different ways for consumers to buy products that they need, such as in-store shopping, mail orders, phone orders, etc. Nowadays, the newest and most notable purchasing method is through electronic commerce, in which goods or services are purchased over the Internet.

The electronic commerce encompasses a broad range of interaction processes between market participants in various roles, including ordering, transport and delivery, invoicing and payment cycle, and customer services. The first stage
of these interactions is gathering information about goods and services, called products (Schmid & Lindemann, 1998). This information is provided in the form of electronic catalogs. In such electronic shopping malls, customers cannot examine products directly but can only view the electronic catalog of the products. So it is important that the electronic catalogs contain sufficient information for customers to decide on their purchases. In addition, since there's no salesclerk in electronic shopping malls, the shopping malls should provide easy and efficient searching methods for customers to access electronic catalogs of products that best match his or her requirements.

To help users to find proper products, electronic shopping malls usually provide three methods of search - hierarchical search, keyword search, and field search. Hierarchical search is performed based on product hierarchies, and the others are based on the product descriptions and attributes.

We have seen a considerable amount of research with remarkable progress concentrated on keyword search and field search to improve the processing speed and quality of results. But, as we are faced with exploding amounts of documents, the results of the field or keyword search are too numerous that we are seldom satisfied with their precision. We propose to improve this situation by combining the methods with hierarchical search which can narrow the search space with product hierarchies. Furthermore, as the product category names can give some clues of the search, hierarchical search is the most effective way when users are not exactly sure what they want. So, it is important to maintain a good product hierarchy and be able to easily adapt to changes. In addition, as the product hierarchy can be the skeleton of the web site of the shopping mall, the site management and customization efforts can be facilitated if the product hierarchy is dynamic and flexible. We propose an electronic catalog model and a product hierarchy model that are sufficiently expressive and, at the same time, flexible, and easy to modify.

One of the biggest parts of the startup cost of internet malls is building electronic catalogs. As multiple sites carry the same product, it makes sense to share some of the burden by use of a shared repository of electronic catalogs for Internet malls to reduce the cost of building electronic catalogs (Lee, Wu, Kim, Kim & Shin, 1998). With the shared repository, the manufacturer will upload the core catalogs that include the basic information about her products, and the shop can download these core catalogs and well defined product hierarchies of the shared repository. The shared repository may have electronic catalogs for a wide range of products and product hierarchies covering them, while individual shops need only subsets of them. So it is essential that there is a method to get a subset of electronic catalogs with a focused view of the product hierarchies. If we combine the electronic catalogs and product hierarchy and treat it as a searchable object,
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