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Chapter VII

An Evaluation of Dynamic Electronic Catalog Models in Relational Database Systems

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ABSTRACT

Electronic catalogs are electronic representations about products and services in the electronic commerce environment and require diverse and flexible schemas. Although relational database systems seem to be an obvious choice for their storage, traditional designs of relational schemas do not support electronic catalogs in the most effective ways. Therefore, new models for managing diverse and flexible schemas in relational databases are required for such systems. Proposed in this paper are several models for electronic catalogs using relational tables, and an experimental evaluation of their efficiency. The results of this study can be put to practical use and are, in fact, being applied in the design of a commercial software product.

INTRODUCTION

Electronic catalogs are electronic representations of information about the products and services of an organization (Segev et al., 1995). A typical catalog containing 100,000 products may contain thousands of different schemas (Jhingran, 2000). For example, a "TV" may have a 'voltage' attribute while a "pen" may not. Consequently, one of the biggest problems in electronic catalogs is diversity of schemas for products.

For this reason, XML seems to be a suitable alternative that meets the requirements of electronic catalogs. However, it is inefficient to store large numbers of catalog data as XML documents. Relational database systems are still the most practical choice for managing business data (Shanmugasundaram et al., 1999).

However, traditional relational databases are not geared toward managing several schemas at once or managing a universal table with many nulls. Consequently, careful application level design is required. For example, a frequently used model represents catalogs in the form of <id, attribute name, attribute value>. But this scheme requires multiple self-joins to retrieve information about a product and, thus, is inefficient in managing a large quantity of product data. We should therefore consider other models that support the view of thousands of tables efficiently from an application perspective, yet manage the database from a finite set of verticalized tables (Jhingran, 2000).

This paper suggests several models for electronic catalogs using relational databases, and verifies their efficiencies through experiments. The goal is to find the most efficient model, and to utilize it in a practical electronic catalog system.

Figure 1: Experimental process