



Chapter VIII

**Database Management
Issues in the
Web Environment**

J.F. Aldana Montes
Universidad de Málaga, Spain

A.C. Gómez Lora
Universidad de Málaga, Spain

N. Moreno Vergara
Universidad de Málaga, Spain

M.M. Roldán García
Universidad de Málaga, Spain

ABSTRACT

The focus of this chapter is on the progressive adaptation of database techniques to Web usage in a way quite similar to the evolution from integrated file management systems to database management systems. We review related and open issues, such as the semi-structured data and XML, integrity problem, query optimization problem, and integration issues in both the Web and Semantic Web environments. The representation of meta-information along with data opens up a new way to automatically process Web information due to the use of explicit semantic information. We hope that researchers will take into account traditional database techniques and how they can assist new Web technologies. In this sense, the amalgamation of Web and database technology appears to be very promising.

INTRODUCTION

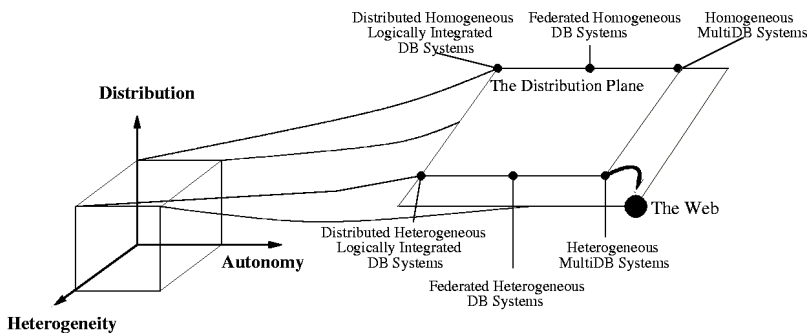
The focus of this chapter is on introducing a new paradigm: the Web as the database, i.e., the progressive adaptation of database techniques to Web usage. We consider that this will be done in a way quite similar to the evolution from integrated file management systems to database management systems. In any case, this is a much more difficult goal and quite a lot of work is still to be done.

The database community has been seriously disturbed with the Web technologies expansion. Particularly, two reports have produced a special commotion in database field. The first one, the Asilomar report (Bernstein et al., 1998), postulates the new directives in databases tendencies, previewing the Web impact in this field. The second one, *Breaking out of the Box* (Silberschatz & Zdonik, 1996), proposes how the database community must transfer its technology to be introduced into Web technology. In this sense, we have broken out of the database box into its autonomous functional components, and we are using these to reach a solution for the problem of heterogeneous data sources integration.

It is within this context that we are going to study the different issues of data management in the Web. This chapter reviews related and open issues, such as the semi-structured data and XML, integrity problem, query optimization problem, and integration issues in both the Web and Semantic Web environments. Finally, we will briefly discuss how traditional database technologies can be used to solve these open points. The special features of the Web environment make techniques for querying or maintaining the Web different from those for traditional databases.

Thinking about the Web as a huge, highly distributed database, we may consider different dimensions to conceptually describe it. Tamer Özsu and Valduriez (1999) define a classification of database systems with respect to: (1) their distribution, (2) the autonomy of local systems and (3) the heterogeneity of database systems. The autonomy concept is considered as the distribution of control, not of data. This indicates the degree to which individual DBMSs can operate independently. Whereas autonomy refers to the distribution of control, the distribution dimension deals with the physical distribution of data over multiple sites. With respect to heterogeneity, this can range from hardware heterogeneity, differences in networking protocols, variations in DBMSs, etc., to the data model or the policy for managing integrity on the database.

Figure 1. *Extending the Cube*



24 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/database-management-issues-web-environment/9208

Related Content

Integrity Issues in the Web: Beyond Distributed Databases

Jose F. Aladana Montes, Mariemma I. Yague del Valle and Antonio C. Gomez Lora (2002). *Database Integrity: Challenges and Solutions* (pp. 293-321).

www.irma-international.org/chapter/integrity-issues-web/7885

Model Driven Engineering for Quality of Service Management: A Research Note on the Case of Real-Time Database Management Systems

Salwa M'barek, Leila Baccouche and Henda Ben Ghezala (2016). *Journal of Database Management* (pp. 24-38).

www.irma-international.org/article/model-driven-engineering-for-quality-of-service-management/178634

A Development Environment for Customer-Oriented Web Business

Choongseok Lee, Woojong Suh and Heeseok Lee (2005). *Encyclopedia of Database Technologies and Applications* (pp. 184-190).

www.irma-international.org/chapter/development-environment-customer-oriented-web/11143

Normalizing Multimedia Databases

Shi Kuo Chang, Vincenzo Deufemia and Giuseppe Polese (2005). *Encyclopedia of Database Technologies and Applications* (pp. 408-412).

www.irma-international.org/chapter/normalizing-multimedia-databases/11181

Incorporating Spatial Queries into Semantic Sensor Streams on the Internet of Things

Sungkwang Eom and Kyong-Ho Lee (2017). *Journal of Database Management* (pp. 24-39).

www.irma-international.org/article/incorporating-spatial-queries-into-semantic-sensor-streams-on-the-internet-of-things/194998