

# Tutorial: Data Access

## José A. Blakeley

Microsoft Corporation  
One Microsoft Way  
Redmond, WA 98052-6399 USA  
Email: [joseb@microsoft.com](mailto:joseb@microsoft.com)  
Phone: +1 (425) 936-5477

## Anand Deshpande

Persistent Systems Private Limited  
Panini, 2A Senapati Bapat Road  
Pune 411 016 India  
Email: [anand@pspl.co.in](mailto:anand@pspl.co.in)  
Phone: +91 (20) 567 67 00

## Abstract

With an explosion of data on the web, consistent data access to diverse data sources has become a challenging task. In this tutorial will present topics of interest to database researchers and developers building: interoperable middle-ware, gateways, distributed heterogeneous query processors, federated databases, data source wrappers, mediators, and DBMS extensions.

All of these require access to diverse information through common data access abstractions, powerful APIs, and common data exchange formats. With the emergence of the web, database applications are being run over the intranet and the extranet. This tutorial presents an overview of existing and emerging data access technologies. We will concentrate on some of the technical challenges that have to be addressed to enable uniform data access across various platforms and some of the issues that went into the design of these data access strategies.

## Tutorial Outline

- *Overview, motivation, need for standards.*
- *Data Access Scenarios*
  - Client data access –from client-server applications
  - Middle-tier data access – from business objects, web servers etc.
  - Server-side issues such as stored procedures or functions.
- *Data Access Services*
  - Connection and resource management
  - Connected and disconnected sessions, local cache, connectionless updatability
  - Navigation (scrolling, filtering and ordering)
  - Bindings from programming languages
  - Distributed Queries
  - Distributed Transactions
- *Data access requirements* in the context of:
  - Internet, ERP, OLAP, and Document applications
- *Overview of technology offerings* and how they address the above requirements
  - Java Data Access
    - JDBC API, driver implementations (two-tier, three-tier), SQLJ
  - Microsoft Universal Data Access
    - Using OLEDB, ADO, and service components to integrate diverse data sources
  - XML in the context of data access
    - XML has rapidly become an important technology for data exchange. We will discuss key XML standards and their impact on business-to-business electronic data exchange.