Objects and Databases
(PANEL)

Thomas Atwood, Object Design
Jnan Dash, Oracle
Jacob Stein, Sybase
Michael Stonebraker, Illustra
Mary Loomis, Hewlett-Packard Labs (moderator)

The members of this panel are experts in object and relational database technologies. The objective of this panel is to better understand the implications the choice of database technology has on the application developer using objects. Differentiating between the relative strengths and weaknesses of the various approaches -- relational (RDBMS), extended-relational and object (ODBMS) -- can be a confusing task. The situation is becoming more complex as the technologies evolve to leverage each other's strengths. Some RDBMSs are beginning to support some aspects of object technology and some ODBMSs are now supporting SQL query capabilities and interfaces.

Each panelist has been asked to describe a typical success story with his favorite technology, be it relational, extended-relational or object database. Preferably the situation will be one where a customer abandoned one of the technologies and moved to successful deployment with the panelist's advocated approach. The characteristics of these situations should lead to better understanding of when it is appropriate to use each type of DBMS with objects. The panel presentations will start with discussion of situations appropriate for the RDBMS approach, then proceed to the extended-relational approach, and end with the use of ODBMSs.

Jacob Stein (Strategic Planning Manager, Sybase)
While the choice of an ODBMS is appealing to application developers using an object programming language, this choice is often of limited applicability. In particular, ODBMS solutions are often limited to a single language, to single-application environments, to environments not requiring multiple views of data (i.e., three-level architecture support), to client-centric applications that do not require traditional server-side support, and to departmental environments not requiring sophisticated database administration. Object gateways to RDBMSs are often the best solution for developers in multiple-language, multiple-tool or multiple-application scenarios, that must serve large numbers of users in integrated corporate environments. RDBMS is often the only solution in very large database applications, or in situations requiring access to and preservation of existing data already in relational systems.

Background
Dr. Stein's responsibilities include oversight of Sybase's object technology and tools initiatives. He has been involved in the research, development, marketing and application of object technology for over a decade. At Servio, developer of the GemStone ODBMS, Jacob held several positions, including Chief Technologist and Director of Marketing. He represents Sybase (and represented Servio) at the Object Management Group (OMG) and the Object Database Management Group (ODMG). Dr. Stein received his Ph.D. from the State University of New York at Stony Brook, where he worked with Dr. David Maier on object extensions to the relational model.

Jnan Dash (Vice President Product Strategy and Technology, Oracle Corp.)
An evolutionary approach towards a rapprochement of relational and object technologies is what Oracle envisions for the future. The advantages of relational technologies (for example, non-navigational access, query optimization, lessons learnt in performance, concurrency control and distribution) must be combined with the power of object technology (including ADTs and the encapsulation of data and behavior in one abstraction). More importantly, the DBMS by itself is only a partial solution. The entire

spectrum of "GUI-objects to stored-objects" must be addressed. Object storage, manipulation and distribution must be complemented with object definition, modeling and assembly. Tools must span client-side end-users (for example with OLE2 and VBx) to enterprise levels for analysis, design, modeling and workflow.

Background
Jnan Dash is responsible for product planning and architecture at Oracle. Prior to joining Oracle in 1992, Mr. Dash was with IBM for 16 years, mostly at the Santa Teresa Lab in San Jose. He was in the original DB2 development team and was the original planner and architect of OS/2 Database Manager. Jnan speaks frequently at industry events on database technology.

Michael Stonebraker (Chief Technology Officer, Illustra Information Technologies)
Illustra is the leading example of an object-relational DBMS: a database that can be extended with user-defined data types and functions. Using Illustra, customers can develop applications that use SQL to query and manipulate complex data such as time series. This talk will focus on a Wall Street risk management application utilizing complex queries against time-series data; an application that proved impossible to build using an RDBMS.

Background
Dr. Michael Stonebraker is co-founder, chief technology officer and member of the Board of Directors of Illustra Information Technologies, Inc. A noted expert in DBMSs, operating systems and expert systems, Dr. Stonebraker is professor of Electrical Engineering and Computer Sciences at the University of California, Berkeley, where he joined the faculty in 1971. Illustra represents the commercialization of his U.C. Berkeley POSTGRES research project, which is one of the most advanced database research projects ever undertaken. He received a B.S. from Princeton University and M.S. and Ph.D. from the University of Michigan.

Thomas Atwood (Chairman, Object Design)
ODBMS initially took hold in engineering and technical applications. Now ODBMSs are moving rapidly into segments of the mainstream commercial market: telecommunications, utilities, and financial services. Fortune 1000 firms are moving to modern client-server hardware configurations, at the same time as they are moving to modern object software development environments. This transition is at a half-way point today. Firms have moved to objects for their GUI and their programming environments, but are still translating object schemas into relational tables for data storage. The next step is to replace the RDBMS with an ODBMS, giving a uniform object environment from the front-end to the back-end. Mr. Atwood's comments will focus on a particular application written in an object 4GL, and will compare the process of mapping its objects to and from a set of relational tables, versus storing them directly as objects in an ODBMS.

Background
Thomas Atwood is founder of Object Design, Inc., one of the leading players in the new generation of ODBMS firms. In addition to contributing significantly to the development and marketing of the firm's ODBMS product ObjectStore, he has assembled a high-powered set of partners for ODI. Recent investors include IBM, AT&T and Intel. Earlier this year he set up a new business unit of ODI to develop 4GL and Smalltalk bindings for ObjectStore. These bindings will allow ODI to capitalize on the strong interest in object-oriented programming emerging within Fortune 1000 firms. Mr. Atwood is also a Director of the Object Data Management Group (ODMG), which in Q1 of this year introduced its first draft standard for ODBMSs.