Objects and Database Standards
(PANEL)

Rick Cattell, SunSoft
Frank Manola, GTE Laboratories
Richard Soley, Object Management Group
Jeff Sutherland, VMARK Software
Mary Loomis, Hewlett-Packard Laboratories (moderator)

The members of this panel are active in the area of standardization of object and database technologies. The objective of this panel is to better understand current activities related to objects and database standards and the prognosis for reaching agreement. For years now there has been tension not only between the object and database worlds, but also within the database world between the object-database and relational-database communities. These tensions surface in efforts to standardize the object and database technologies. There are several groups involved in these efforts: this panel represents the viewpoints of the Object Management Group (OMG), the Object Database Management Group (ODMG), the ANSI X3H2 SQL Database Technical Committee, and the ANSI X3H7 Object Information Management Technical Committee.

Each panelist has been asked to describe his role in the objects and database standards efforts, then to talk about why he is either hopeful or not that the range of pertinent efforts will actually converge. Each panelist will raise what he sees as the primary issues in convergence and will suggest approaches to resolving apparent differences.

Richard M. Soley (OMG)
The OMG has an architectural view that admits heterogeneity of all kinds -- from hardware to object model -- and has in the past two years concentrated on service API's that seem database-like. The power of objects seems applicable to most real-world things and the relational calculus is a well-accepted way to understand (and represent) real-world relationships. While the idea of convergence between object technology and relational database technology is a widely accepted idea, there is not yet consensus on details of how the two technologies fit together. Furthermore, there is no single view on how to integrate with the rest of the legacy picture, i.e. with the applications that are not database-centric. I will talk about how the OMG's invocation-centric model of the world might be one of the keys to convergence between the "object world" and the "database world."

Background
Dr. Soley is Vice President and Technical Director of the OMG, an industry consortium, whose more than 500 members are building an architecture for heterogeneous, distributed, integrated computing using a consensus-based model for standards. Richard received the SB, SM and PhD in Computer Science & Engineering from MIT, and has been involved in a series of start-ups, ranging from Symbolics to PictureTel to A.I. Architects.

R.G.G. "Rick" Cattell (Sun Soft)
For the most part, the work on object standards by OMG, the ODMG, C++, Smalltalk, SQL3, and other groups are complementary and synergistic. Collectively, they provide solutions for the programming language, database, and distributed computation aspects of the object environment. However, in a few areas there are conflicts, and these conflicts will not easily be solved due to the nature of standards groups and the lack of a forcing function for the solution. I will talk about some of these problems, e.g., the differences between the OMG/ODMG data model and the SQL3 model, and what we can do to resolve them.

Background
Dr. Cattell is a Distinguished Engineer at SunSoft, where his work focusses on next-generation database technologies. He currently serves as a lead architect on the Distributed Object Environment product. He

has worked for over ten years at Sun Microsystems, in both management and senior technical roles, and for ten years in research at Xerox PARC and at Carnegie-Mellon University. He is the founder and chair of the ODMG, was author of the world's first monograph on object database systems, and was the recipient of the ACM Outstanding Dissertation award.

Jeff Sutherland (VMARK Software)
The convergence of database standards is important to worldwide industrial productivity. The ANSI X3H7 committee noted in 1994 that a single query language for object databases and current relational technology that reduced the impedance mismatch between object-oriented applications and data storage facilities would do more to reduce unnecessary development and maintenance costs than any other single achievement in the computer industry. As liaison to the X3H2, I will represent the views of the SQL Database Committee and their work toward achieving unification of the ODMG OQL and the SQL3 standards.

Dr. Sutherland is Vice President of Object Technology at VMARK Software and provides object-oriented strategies for VMARK's Object Studio Smalltalk products, Hyperstar middleware products, and Universe database technology. He is Secretary of the ANSI X3H7 committee, the X3H7 liaison to the ANSI X3H2 Committee, and Chair of the Ad Hoc Joint Committee of ODMG, X3H2, and X3H7.

Frank Manola (GTE Laboratories)
One of the goals of the ANSI X3H7 Committee is to foster interoperability among standards that incorporate object facilities. The (roughly) concurrent development of object extensions to SQL by X3H2, object DBMS standards by ODMG, and distributed object standards by OMG provides a unique opportunity to harmonize these standards. This harmonization would be of immense benefit to users of database and distributed object systems, by ensuring maximum interoperability among these key components of future computing architectures. The groups mentioned have been invovled in cooperative work toward this goal for some time now.

I will discuss several things that will be important to this harmonization. (1) Users are increasingly looking for ways to combine the full flexibility and power of today's relational DBMSs with the full power of object-oriented development, to support increasingly complex applications. Database standards must provide for clean and efficient interfaces to programming languages that support object facilities. (2) Users are increasingly using DBMSs as parts of large-scale distributed architectures, such as "three-tier" client-server architectures which separate user interfaces, business logic, and database servers. Database standards must reflect the need to provide clean and efficient interfaces with the middleware, such as that based on OMG specifications. (3) Today's standards must take into consideration the potential for rapid advancements of both object technology (e.g., compound document architectures, new object languages and environments) and database technology (e.g., OLAP, and other new applications). Standards thus must balance short-term requirements with long-term vision for evolution. One thing that would support cleaner long-term evolution would be advances on the formal basis of standards, based on a unification of object and relational database technology.

Background
Frank Manola is a Principal Member of Technical Staff in the Distributed Systems Technology Department at GTE Laboratories. His major research areas are distributed object systems and object database systems. He is a member of the ANSI X3H7 Committee and heads X3H7's object model comparison activity.