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Success Story - Marsh's Insurance Risk Management Software Package

One of the earliest, large-scale Windows-based solutions portable to multiple databases

Marsh (formerly, J&H Marsh & McLennan), the world's largest insurance broker, built their award-winning risk management package, Stars®, with Base One's programming tools and middleware. This is one of the earliest successful examples of a commercial, Windows database application that can run on multiple database systems and whose performance scales effectively from desktop to large clusters of computers.

In the early 1990's, Marsh decided to take their small-scale, MS-DOS, insurance risk management package and turn it into a Windows software product capable of handling the needs of their largest customers. Marsh's IT staff was very experienced at building smaller volume yet feature-rich commercial insurance applications and had developed a flexible system that looked great as a prototype. But in production, it had severe performance problems as soon as the data from any of their larger customers was loaded. Once they realized that no amount of tuning would give them acceptable performance, they decided that a total rewrite and outside assistance was justified.

In 1994, under contract to Marsh, Base One began implementing its multi-platform database and security components. Databases from Microsoft, Oracle, and Sybase running on Windows, Unix, and IBM mainframe servers were targeted initially. The objective was to develop Stars so that it would support, with a high level of performance, a mixed workload of transactions, complex queries, large-scale data loads, and long-running, database-intensive reports.

Building on Base One's class libraries, Stars® 1.0 was released in 1995, resulting in Marsh's sales of the solution to a number of new high-end and mid-range customers. Stars development and sales progressed rapidly using Base One's growing set of database tools. By 1998, Stars® 4.0 was generating \$50 million in annual sales of software and related services for Marsh. It was delivering sophisticated insurance risk-management and reporting to over 400 large corporate clients, including Boeing, Microsoft, PPG (Pennsylvania Plate Glass), and Wal-Mart.

Because of the early success of their commercial software package, Marsh also began using Base One's software for internal database projects. For example, a Marsh programmer who had worked on the Stars team, using Base One's tools and middleware, rapidly developed a sophisticated multi-user database application for tracking and processing tens of thousands of insurance certificates.

Base One's software provided Marsh with facilities which are logical extensions necessary for large-scale development, but which are not included in the current generation of commercial database management systems. Base One's software

components present a uniform, DBMS-independent interface that operates through both Microsoft's ODBC (Open Database Connectivity) and high-efficiency native direct connections. The interface shielded Marsh's developers from much of the complexity of scaling up their applications to efficiently and reliably process large, multi-user databases.

For example, the facility for automated client-side caching of both data and metadata helps prevent database connection "overload". The automated "optimistic" concurrency control minimizes the length of time locks need to be held. (This guarantees efficient, rigorous handling of data access collisions, such as multiple users trying to modify the same records or index pages.) The data dictionary facility works without change across the different database systems and automatically generates database layouts, indexes, security settings, and performance optimizations. And, the database components for large-scale browsing automatically force index searches and prevent sorts. (Programmers specify queries in the simplest way, and these are automatically adjusted to significantly improve performance.)

With each release of Stars, Base One added significant extensions, such as the "Attached Object" database facilities. This allowed a claims examiner or lawyer to scan in photos and documents in a variety of formats and dictate notes directly into the computer's microphone – all automatically associated with the appropriate database record(s). The functions were designed to work efficiently under the demands of slow networks, lots of users, lots of data, and a dynamic transaction processing and reporting workload.

Internally, Base One's software is optimized for each type of database, but the uniform, external interface made it practical for Marsh to program Stars as a database-independent commercial application. Marsh leveraged the database components to deliver an efficient package that could be quickly integrated into a customer's existing network access controls and Microsoft, Oracle, or Sybase database environment.

Because of the medical and legal information stored within Stars, privacy and security were major concerns. The database contains Workmen's Compensation claims, accident occurrences, injury and treatment records, legal claims and exhibits. This sensitive data is used to estimate and forecast insurance-related costs, identify risks and exposures, look for fraud, and improve workplace safety.

Under contract to Marsh, Base One added security and administration components to the toolkit that made it practical to efficiently integrate sophisticated, application-specific behavior, such as filtering data depending on who is looking at it. The resulting database architecture is especially well suited to building secure enterprise applications. Administrators can assign security privileges and set security rules. Marsh programmers found it simple to build applications that permit managers to control the items a particular user can select, the buttons or links that can be pushed, and the screens or web pages that can be seen. This is in addition to supporting the normal database administrator authority to decide what record types (tables) a user can modify or query.

A major manufacturer wanted a customized version of Stars. In addition to specialized forms and reports, they required security features that would allow managers to see claims only for their assigned locations, and their supervisors, in turn, would see claims only for those managers reporting to them. The job had to be done quickly, with as few modifications as possible. As a result of the object-oriented design of Base One's software, these security customizations were not only easy to create, but also easy to maintain.

For over 10 years, Base One's tools and middleware have proven to be practical and effective because they were developed jointly with Marsh, under demanding requirements, with rapid, real-world feedback. In 1996, Marsh began a partnership with Base One to license the development tools to Deutsche Bank for a new securities custody system. Until 2003, when the custody business was sold, Deutsche Bank licensed the tools from Marsh and Base One, and contracted for major product enhancements, including further large-scale performance improvements, administrative controls, and support for grid and cluster computing.