Relational Database Management Systems: The Business Explosion

Burton Grad

In the previous special issue of the *Annals* on relational database management systems (October–December 2012), we told the story of how the relational concept conceived of and published by E.F. (Ted) Codd was translated into practical products through work at IBM and Oracle, as well as by the University of California, Berkeley, which was then pursued by Ingres. But that was just the technological foundation for the industry, and the new early relational database management system (RDBMS) products were minor factors in what was already a rich database management systems industry using network and hierarchical concepts to store and retrieve data in virtually every industry, business, and government agency.

In This Issue

This issue tells the history of how the new, independent software companies and IBM built companies that supplanted the DBMS companies and their DBMS models in both query-oriented usage and in many transaction-processing applications. The story of this transformation is told in this issue of the *Annals*, which describes how each of these pioneering RDBMS companies developed and marketed their products to meet the relational challenge and how well they succeeded. The result was explosive business growth and creation of five companies, each with more than $1 billion in sales.

This special issue focuses on the growth of four of the leading RDBMS companies, with recollections by the pioneers about the history of the companies that they worked for: IBM, Oracle, Informix, and Sybase. (The business history of Ingres was covered in the previous RDBMS issue.) To provide a consistent framework for these recollections, we asked each of the authors to address these questions:

- Where did the basic idea come from? Was it related to a particular application or user? What was the underlying technological approach? What were the special aspects of the product?
- What was the business framework in which the RDBMS was developed? Where did the financing come from? What did it cost to produce and over what period of time? Who were the key developers?
- How did the business case work out? Who were the first customers and for what applications? What were the revenues in the first few years? What was the sales model?
- What happened later to the product? How was it enhanced? What were the major technical challenges? What platforms did it operate on? What was the market share?
- What was the end result in terms of who ended up owning/running the company? If the company was sold, what was the value of the transaction?

As a result, we have the history of how each of these companies entered and succeeded in the relational database management marketplace. Each was unique in its approach from a technical, financial, marketing, and management standpoint. Each story is a mixture of business, technology, and marketing recollections, and together they present a picture of a worldwide competition to be the ''top gun'' in this software area of rapid growth and high profitability.

In addition, thanks to the assistance of Craig Partridge, former *Annals* Anecdotes editor, we have been able to enhance the issue by including two Anecdotes by industry pioneers on other RDBMS topics: Donald Deutsch describes the process of setting SQL standards, and Hershel Harris and Bert Nicol tell the history of SQL/DS, IBM's first RDBMS product. In addition, Rick Bennett tells the story of Oracle's targeted marketing advertisements.

Capturing Software and Services

This is the sixth special issue of the *Annals* edited or coedited by Luanne Johnson and myself, the cofounders of the Software Industry Special Interest Group (originally the Software History Center), which is now affiliated with the Computer History Museum in Mountain View, California. These issues have been supported by a wealth of material that has been collected since 2000 including transcripts of workshops, oral histories, personal stories, and other online and physical materials that reside at both the Charles Babbage Institute at the University of Minnesota in Minneapolis, Minnesota, and at the Computer History Museum. We are especially appreciative of the support from Tim Bergin, David Alan Grier, and Jeffrey R. Yost, the three previous editors in chief of the *Annals* who have encouraged and assisted us over the last 12 years. We are particularly indebted to all of the other computer historians who have worked with us by helping to structure and participate in this long-term history collection and communications project. Among them, the following historians have been prime players: David Allison, William Aspray, Martin Campbell-Kelly, Paul Ceruzzi, Thomas Haigh, and Michael Mahoney (now deceased).
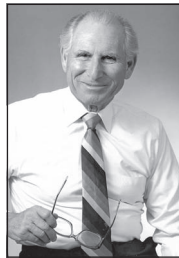
The goal of this work has been to preserve part of the history of the computer software and services industry. This industry consists of thousands of companies providing a range of products and services. Most of us are aware of the software products that we have running on our personal computers, but there are many more programs that enable businesses to run their operations, regardless of what specific industry they are in. In addition, many companies in the industry provide professional programming services, and processing services companies enable users to use software through access to computers on an online basis. This is a truly international software and services industry, but since its beginning, US companies have been the technological and marketing leaders.

Although the software industry dwarfs the computer hardware industry in size, unfortunately it gets little attention from museums and archives. Hardware is tangible and displayable while software can't be touched, and the advances and creations do not appear as dramatic as the computing chips and memory devices that have become so much smaller and faster over time. Nevertheless, the use of computers is driven entirely by the software, which is the brains behind the brawn. And there are many more people involved in system design and programming than in hardware engineering and manufacturing. The interface that all of us see when we are using a computer application is created by the software.

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We trust that these special issues of the *Annals* and the many other articles that Luanne Johnson has helped to get written and published in the *Annals* will raise the visibility of the computer software and services industry. In some ways, the proof of the pudding is in the eating: IBM, which was the largest computer hardware company in the world through the 1990s, now gets at least half of its revenue and more than half of its profit from software and services. And the new stars of the computing industry are all following this software and services model.

Burton Grad has been an active participant in the computer software field since 1954, with General Electric, IBM, and in his own company, Burton Grad Associates. He is currently the cochair of the Software Industry Special Interest Group at the Computer History Museum, which has focused on conducting pioneer meetings, collecting oral histories, and obtaining software company business files. Contact him at burtgrad@aol.com.

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