50 years of queries

Chamberlin D. Communications of the ACM67 (8):110-121,2024.Type:Article

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The relational model is probably the one innovation that brought computers to the mainstream for business users. This article by Donald Chamberlin, creator of one of the first query languages (that evolved into the ubiquitous SQL), presents its history as a commemoration of the 50th anniversary of his publication of said query language.

The article begins by giving background on information processing before the advent of today's database management systems: with systems storing and processing information based on sequential-only magnetic tapes in the 1950s, adopting a record-based, fixed-format filing system was far from natural. The late 1960s and early 1970s saw many fundamental advances, among which one of the best known is E. F. Codd's relational model. The first five pages (out of 12) present the evolution of the data management community up to the 1974 SIGFIDET conference. This conference was so important in the eyes of the author that, in his words, it is the event that "starts the clock" on 50 years of relational databases.

The second part of the article tells about the growth of the structured English query language (SEQUEL)--eventually renamed SQL--including the importance of its standardization and its presence in commercial products as the dominant database language since the late 1970s. Chamberlin presents short histories of the various implementations, many of which remain dominant names today, that is, Oracle, Informix, and DB2. Entering the 1990s, open-source communities introduced MySQL, PostgreSQL, and SQLite.

The final part of the article presents controversies and criticisms related to SQL and the relational database model as a whole. Chamberlin presents the main points of controversy throughout the years: 1) the SQL language lacks orthogonality; 2) SQL tables, unlike formal relations, might contain null values; and 3) SQL tables, unlike formal relations, may contain duplicate rows. He explains the issues and tradeoffs that guided the language design as it unfolded. Finally, a section presents several points that explain how SQL and the relational model have remained, for 50 years, a "winning concept," as well as some thoughts regarding the NoSQL movement that gained traction in the 2010s.

This article is written with clear language and structure, making it easy and pleasant to read. It does not drive a technical point, but instead is a recap on half a century of developments in one of the fields most important to the commercial development of computing, written by one of the greatest authorities on the topic.

Reviewer: Gunnar Wolf Review #: CR147819

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