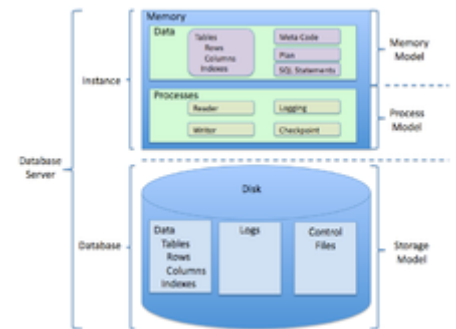


# Relational database management system

A **relational database management system (RDBMS)** is a database management system (DBMS) based on the relational model invented by Edgar F. Codd, of IBM's San Jose Research Laboratory fame. Most databases in widespread use today are based on his relational database model.<sup>[1]</sup>

RDBMSs have been a common choice for the storage of information in databases used for financial records, manufacturing and logistical information, personnel data, and other applications since the 1980s. Relational databases have often replaced legacy hierarchical databases and network databases because, they were easier to implement and administer. Nonetheless, relational databases received continued, unsuccessful challenges by object database management systems in the 1980s and 1990s, (which were introduced in an attempt to address the so-called object-relational impedance mismatch between relational databases and object-oriented application programs), as well as by XML database management systems in the 1990s. However, due to the expanse of technologies, such as horizontal scaling of computer clusters, NoSQL databases have recently begun to peck away at the market share of RDBMSs.<sup>[2]</sup>



The general structure of a relational database.

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## Market share

According to DB-Engines, in May 2017, the most widely used systems are Oracle, MySQL (open source), Microsoft SQL Server, PostgreSQL (open source), IBM DB2, Microsoft Access, and SQLite (open source).<sup>[3]</sup>

According to research company Gartner, in 2011, the **five leading commercial relational database vendors by revenue were Oracle (48.8%), IBM (20.2%), Microsoft (17.0%), SAP including Sybase (4.6%), and Teradata (3.7%).**<sup>[4]</sup>

## History

In 1974, IBM began developing System R, a research project to develop a prototype RDBMS.<sup>[5][6]</sup> However, the **first commercially available RDBMS was Oracle**, released in 1979 by Relational Software, now Oracle Corporation.<sup>[7]</sup> Other examples of an RDBMS include DB2, SAP Sybase ASE, and Informix. In 1984, the first RDBMS for Macintosh began being developed, code-named Silver Surfer, it was later released in 1987 as 4th Dimension and known today as 4D.<sup>[8]</sup>

## Historical usage of the term

The term "**relational database**" was **invented by E. F. Codd at IBM in 1970**. Codd introduced the term in his research paper "A Relational Model of Data for Large Shared Data Banks".<sup>[9]</sup> In this paper and later papers, he defined what he meant by "relational". One well-known definition of what constitutes a relational database system is composed of Codd's 12 rules. However, many of the early implementations of the relational model did not conform to all of Codd's rules, so the term gradually came to describe a broader class of database systems, which at a minimum:

- Present the data to the user as relations (a presentation in tabular form, i.e. as a *collection of tables* with each table consisting of a set of rows and columns);
- Provide relational operators to manipulate the data in tabular form.

The first systems that were relatively faithful implementations of the relational model were from:

- University of Michigan --Micro DBMS (1969)
- Massachusetts Institute of Technology (1971)<sup>[10]</sup>
- IBM UK Scientific Centre at Peterlee --IS1 (1970–72) and its successor PRTV (1973–79)

The first system sold as an RDBMS was Multics Relational Data Store (1978). Ingres and IBM BS12 followed.

The most common definition of an RDBMS is a product that presents a view of data as a collection of rows and columns, even if it is not based strictly upon relational theory. By this definition, RDBMS products typically implement some but not all of Codd's 12 rules.

A second school of thought argues that if a database does not implement all of Codd's rules (or the current understanding on the relational model, as expressed by Christopher J Date, Hugh Darwen and others), it is not relational. This view, shared by many theorists and other strict adherents to Codd's principles, would disqualify most DBMSs as not relational. For clarification, they often refer to some RDBMSs as *truly-relational database management systems* (TRDBMS), naming others *pseudo-relational database management systems* (PRDBMS).

As of 2009, most commercial relational DBMSs employ SQL as their query language.<sup>[11]</sup>

Alternative query languages have been proposed and implemented, notably the pre-1996 implementation of Ingres QUEL.

## See also

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- SQL
- Object database (OODBMS)
- Online analytical processing (OLAP) and ROLAP (Relational Online Analytical Processing)
- Data warehouse
- Star schema
- Snowflake schema

## References

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1. Pratt, Philip J.; Last, Mary Z. (2014-09-08) Concepts of Database Management (<https://www.amazon.com/Concepts-Database-Management-Philip-Pratt/dp/1285427106>) (8 ed.). Course Technology. p. 29. ISBN 9781285427102
2. "NoSQL databases eat into the relational database market" (<https://www.techrepublic.com/article/nosql-databases-eat-into-the-relational-database-market>) Retrieved 2018-03-14.
3. "DB-Engines Ranking of Relational DBMS" (<http://db-engines.com/en/ranking/relational+dbms>) Retrieved 2017-05-31.
4. "Oracle the clear leader in \$24 billion RDBMS market" (<http://itknowledgeexchange.techtarget.com/eye-on-oracle/oracle-the-clear-leader-in-24-billion-rdbms-market/>) 2012-04-12 Retrieved 2013-03-01.
5. Funding a Revolution: Government Support for Computing Research (<https://books.google.com/books?id=wwCbAgAAQBAJ>). National Academies Press. 8 Jan 1999 ISBN 0309062780.

6. Sumathi, S.; Esakkirajan, S. (13 Feb 2008) *Fundamentals of Relational Database Management Systems* Springer. ISBN 3540483977. "The product was called SQL/DS (Structured Query Language/Data Store) and ran under the DOS/VSE operating system environment"
7. "Oracle Timeline" (<http://www.oracle.com/us/corporate/profit/p27anniv-timeline-151918.pdf>) (PDF). *Profit Magazine*. Oracle. **12** (2): 26. May 2007. Retrieved 2013-05-16.
8. "New Database Software Program Moves Macintosh Into The Big Leagues" ([http://articles.chicagotribune.com/1987-06-28/business/8702170525\\_1\\_silver-surfer-software-developers-macintosh-products](http://articles.chicagotribune.com/1987-06-28/business/8702170525_1_silver-surfer-software-developers-macintosh-products)) *tribunedigital-chicagotribune* Retrieved 2016-03-17.
9. "A Relational Model of Data for Large Shared Data Banks" (<http://www.seas.upenn.edu/~zives/03f/cis550/codd.pdf>)
10. SIGFIDET '74 Proceedings of the 1974 ACM SIGFIDET (now SIGMOD) workshop on Data description, access and control
11. Ramakrishnan, Raghu; Donjerkovic, Donko; Ranganathan, Arvind; Beye Kevin S.; Krishnaprasad, Muralidhar (1998). "SRQL: Sorted Relational Query Language" ([http://pages.cs.wisc.edu/~beyer/papers/srql\\_ssdbm98.pdf](http://pages.cs.wisc.edu/~beyer/papers/srql_ssdbm98.pdf)) (PDF). *e Proceedings of SSDBM*

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