**RDBMS and data management**

A **relational database management system** (**RDBMS**) is a [database management system](https://en.wikipedia.org/wiki/Database_management_system) (DBMS) that is based on the [relational model](https://en.wikipedia.org/wiki/Relational_model) as invented by [E. F. Codd](https://en.wikipedia.org/wiki/Edgar_F._Codd), of IBM's [San Jose Research Laboratory](https://en.wikipedia.org/wiki/IBM_Almaden_Research_Center). In 2017, many of the databases in widespread use are based on the [relational database](https://en.wikipedia.org/wiki/Relational_database) model.

RDBMSs have been a common choice for the storage of information in new 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](https://en.wikipedia.org/wiki/Hierarchical_database) and [network databases](https://en.wikipedia.org/wiki/Network_database) because they are easier to understand and use. However, relational databases have received unsuccessful challenge attempts by [object database](https://en.wikipedia.org/wiki/Object_database) management systems in the 1980s and 1990s (which were introduced trying to address the so-called [object-relational impedance mismatch](https://en.wikipedia.org/wiki/Object-relational_impedance_mismatch) between relational databases and object-oriented application programs) and also by [XML database](https://en.wikipedia.org/wiki/XML_database) management systems in the 1990s.[[*citation needed*](https://en.wikipedia.org/wiki/Wikipedia%3ACitation_needed)] Despite such attempts, RDBMSs keep most of the market share, which has also grown over the years.



The general structure of a relational database.

**Historical usage of the term**

The term "relational database" was invented by [E. F. Codd](https://en.wikipedia.org/wiki/Edgar_F._Codd) at [IBM](https://en.wikipedia.org/wiki/IBM) in 1970. Codd introduced the term in his seminal paper "A Relational Model of Data for Large Shared Data Banks".[[8]](https://en.wikipedia.org/wiki/Relational_database_management_system#cite_note-8) 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](https://en.wikipedia.org/wiki/Codd%27s_12_rules%22%20%5Co%20%22Codd%27s%2012%20rules). 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](https://en.wikipedia.org/wiki/Relation_%28database%29) (a presentation in tabular form, i.e. as a *collection* of [tables](https://en.wikipedia.org/wiki/Table_%28database%29) 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 the University of Michigan; [Micro DBMS](https://en.wikipedia.org/wiki/MICRO_Relational_Database_Management_System) (1969), the Massachusetts Institute of Technology;[[9]](https://en.wikipedia.org/wiki/Relational_database_management_system#cite_note-9) (1971), and from IBM UK Scientific Centre at Peterlee; [IS1](https://en.wikipedia.org/wiki/IBM_IS1) (1970–72) and its followon [PRTV](https://en.wikipedia.org/wiki/PRTV) (1973–79). The first system sold as an RDBMS was [Multics Relational Data Store](https://en.wikipedia.org/wiki/Multics_Relational_Data_Store%22%20%5Co%20%22Multics%20Relational%20Data%20Store), first sold in 1978. Others have been [Ingres](https://en.wikipedia.org/wiki/Ingres_%28database%29) and [IBM BS12](https://en.wikipedia.org/wiki/IBM_BS12).

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](https://en.wikipedia.org/wiki/Relational_model). 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](https://en.wikipedia.org/wiki/Christopher_J_Date), [Hugh Darwen](https://en.wikipedia.org/wiki/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 DBMSes employ [SQL](https://en.wikipedia.org/wiki/SQL) as their [query language](https://en.wikipedia.org/wiki/Query_language).[[10]](https://en.wikipedia.org/wiki/Relational_database_management_system#cite_note-10)

Alternative query languages have been proposed and implemented, notably the pre-1996 implementation of [Ingres QUEL](https://en.wikipedia.org/wiki/QUEL_query_languages).