

Why SQL Wins

Sergei Tsarev
Percona Live MySQL
NYC 2011

Early Days of Computing

50s

60s

70s

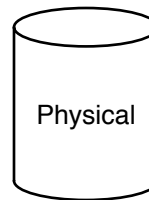
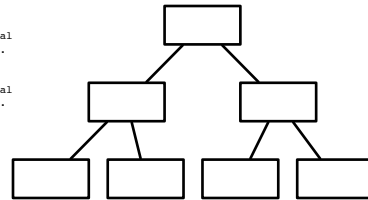
80s

90s

00s

Application

```
Identification DIVISION.  
  Program-ID. MPREPROC.  
Environment DIVISION.  
Input-output section.  
File-control.  
  Select in-file  
    Assign to SYSIN  
    Organization is line sequential  
    File status is in-file-status.  
  Select out-file  
    Assign to outfile  
    Organization is line sequential  
    File status is out-file-status.  
  Select xml-file  
    Assign to SYSXMLSD  
    Organization is line sequential  
    File status is xml-file-status.  
Data Division.  
File section.  
Pd in-file  
  label records are standard  
  recording mode is f
```



No general purpose DBMS

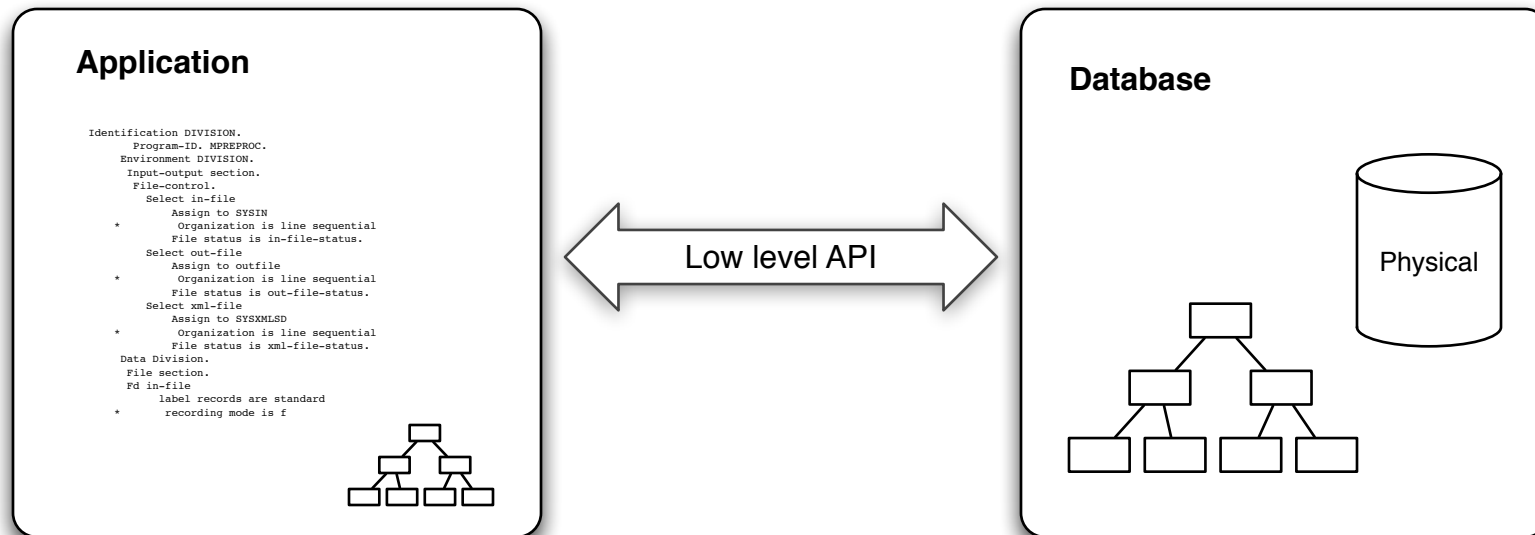
Every database a custom effort

Every query written as a custom program

Application manages both logical and physical data layout

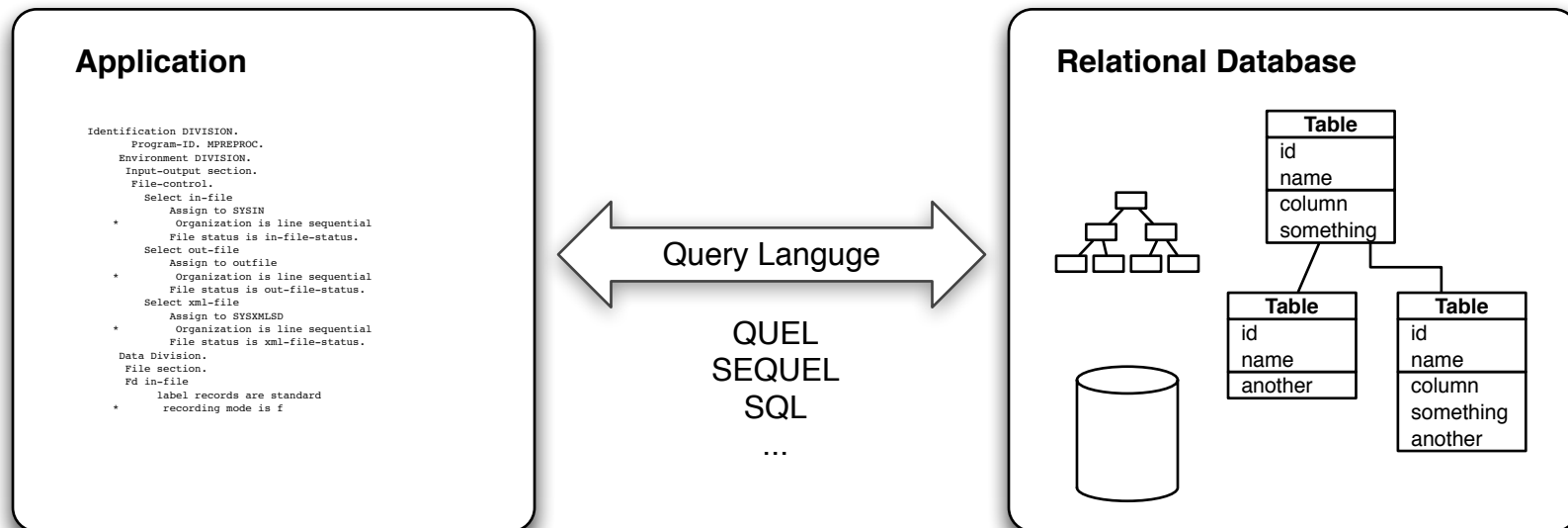
Programmer productivity is very low

Birth of DBMS



First commercial DBMS' sold as toolkits
Some separation of application and database logic
Bachman's "The Programmer as Navigator"

Relational DBMS



Codd introduces the relation model

- separates physical layout from the logical model
- avoids anomalies through normalization
- proposes a set oriented language

All About Relational and Features



- ACID transaction semantics
- Access control in the database
- Multi-version concurrency control models
- Improved planners and optimizers
- Rise of client-server architectures

Exponential Growth in Data for Online Systems

50s

60s

70s

80s

90s

00s



Scale Above Everything

50s

60s

70s

80s

90s

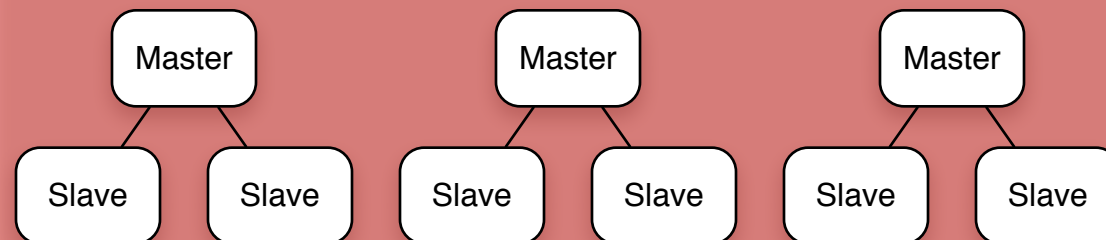
00s

Application

Application Logic or
What really matters to your business

Sharded Data Access Layer or
What your database did for you 10 years ago

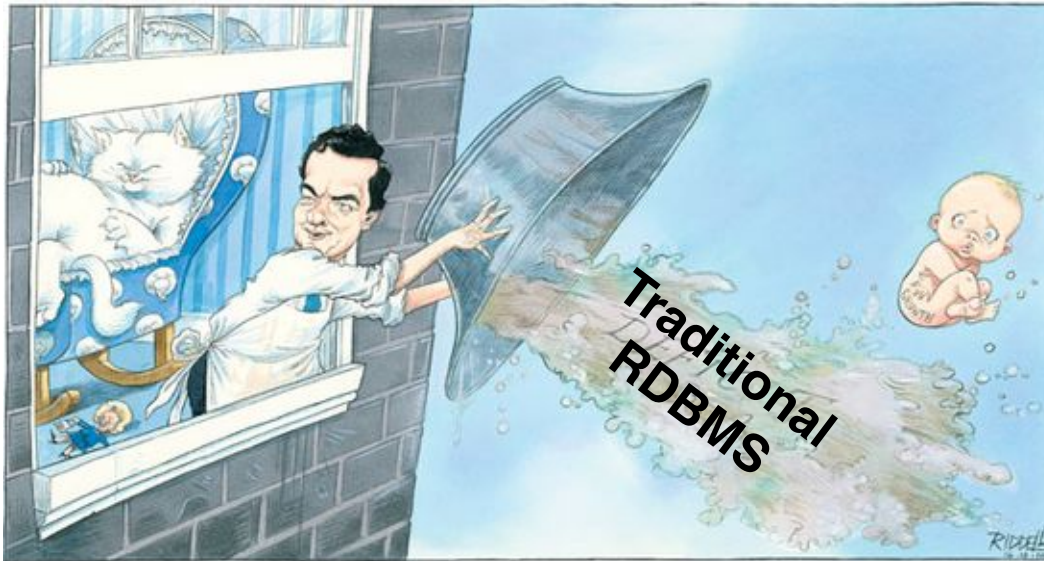
Databases



**No Consistency
No Transactions
No Features
No SQL?**

NO PROGRESS!

Looking Forward



Current RDBMS a product of decades of database research and development
NoSQL is not progress, it's a regression
Fully Featured RDBMS + Scalability: Holy Grail of Databases
SQL Can Scale!